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Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 16/06/22

1. What is the course?

Course information

Course Title	Geographical Information Management
Course code	MSGIMFTC, MSGIMPTC, PDGIMFTC, PDGIMPTC, PCGIMFTC, PCGIMPTC
Academic Year	2021/22
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Centre for Environmental and Agricultural Informatics
Course Director	Dr Daniel Simms
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	NA
Is the Degree apprenticeship integrated or non-integrated?	NA
Is the Mastership offered as an open and/or closed course?	NA
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject Candidates with other qualifications will be considered according to experience; Where applicable minimum IELTS score of 6.5 or TOEFL 580
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	October: Full-time Part-time: Typically an October start

Institutions delivering the course

This course is delivered by the School of Water, Energy, and Environment where the research interests include:

remote sensing, GIS and spatial data management.

Cranfield University interacts with the following institutions and in the following ways:

The Course has an Industrial Advisory Panel that formally meets each year. Current members of the Industrial Advisory Panel include representatives from: Airbus Defence and Space; The Joint Research Centre, Italy; and Geospatial Insights Ltd.

In addition, the Royal Institution of Chartered Surveyors (RICS) reviews the course each year. There are currently five members of the review group: one from a surveying practice, one being the RICS external examiner and the remainder from RICS.

Students are involved with field trips off-campus. In recent years these have included the following organisations: New Forest National Park, TrafficMaster, Geoplan, Surrey Satellites, the Medmenham Collection, ESRI UK.

Students can undertake their individual research project off campus. In recent years, projects have been undertaken with ESRI UK, Natural England, Centre for Ecology and Hydrology, Ordnance Survey.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by Royal Institution of Chartered Surveyors (RICS) and the Institution of Civil Engineering Surveyors. This accreditation is ongoing and is reviewed annually.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- To provide the participant with the capability to develop practical and sustainable applications of remote sensing, Geographic Information Systems and Global Positioning Systems, based upon emerging scientific principles and technological developments;

- To enable the selection of appropriate processing methods for geo spatial data combined with the design, analysis and integration of field survey techniques;
- To focus on integrated analysis of resource assessments from traditional natural resources and socio-economic surveys by the application of spatial analytic capabilities of GIS

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Those wishing to work in the geographic information industry
- Those wishing to work for government departments, agencies, NGOs and consultancies applying GI technologies to their particular areas of work
- Those wishing to develop a research career utilising GI data and methods

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Geographical Information Management

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Apply the principles of geographic information management technologies and processes to a range of geospatial problems
- ILO 2. Interpret spatial data to derive pertinent conclusions
- ILO 3. Evaluate geographic information management methodologies to enable the selection of appropriate analysis methods for a range of applications
- ILO 4. Manage geographical information in a sustainable manner to deliver accurate, timely and appropriate data to a range of clients
- ILO 5. Integrate analogue and digital spatial data derived from geographic information management technologies to produce quality-assured solutions
- ILO 6. Advise non remote sensing or geographic information system specialists as to the role and implementation of geographic information management technologies within a range of applications

B. Postgraduate Diploma in Geographical Information Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Geographical Information Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.
- ILO 9. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

The MSc course is taught in three sections: taught modules (40%), a group project (20%), and an individual research project (40%). The taught modules are typically delivered with one week contact time between October and February. The teaching methods include practical sessions, field visits, lectures, seminars, and presentations.

The Group Project is a group-based activity typically undertaken between March and May.

The Project is designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

For the Individual Research Project, each student is allocated two supervisors. Guidance sessions are provided as to what is required from the thesis and oral presentation.

Within the induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. During the group project students will be given training in group-working and project management, and will reflect on their personal development.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
ELECTIVE MODULES:	
GIS & Spatial Data Management	10
Scientific Python	10
Aerial Photography and Digital Photogrammetry	10
Applied Earth Observation	10
Image Processing & Analysis	10
Advanced GIS Methods	10
Environmental Resource Survey	10
Web Mapping	10
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
GIS & Spatial Data Management	10
Scientific Python	10

Aerial Photography and Digital Photogrammetry	10
Applied Earth Observation	10
Image Processing & Analysis	10
Advanced GIS Methods	10
Environmental Resource Survey	10
Web Mapping	10
Group Project (Full Time Students)	40
ELECTIVE MODULES:	
Part Time Students:	
Group Project OR Dissertation	40
	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
GIS & Spatial Data Management	10
Scientific Python	10
Aerial Photography and Digital Photogrammetry	10
Applied Earth Observation	10
Image Processing & Analysis	10
Advanced GIS Methods	10
Environmental Resource Survey	10
Web Mapping	10
Group Project (Full Time Students)	40
Thesis	80
ELECTIVE MODULES:	
Part Time Students:	
Group Project	40
OR	
Dissertation	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;

- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); ³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Please see section 7 for details on the individual elements of the course.

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. One example is to complete four taught modules and a dissertation in year 1, four taught modules and a thesis and oral presentation in year 2. An alternative is to spread the taught modules over three years completing the dissertation by the end of year 2 and the thesis and oral presentation in year 3.

Part time students would be strongly encouraged to join the course at the start of the new academic year to coincide with induction for full time students. If they however join in year then ad hoc induction sessions can be arranged as required.

7. Course Level Assessment Strategy⁴

The course assessment tasks enable students to demonstrate a full range of skills and attributes. The modules GIS & Spatial Data Management and Scientific Python will introduce students to the fundamentals of mapping and working with spatial datasets alongside coding and the fundamentals of Data Science, which will be assessed through the production of maps and visualisations integrating sources of geospatial data and short reports. These will be of varying lengths, recognising that writing articles to a short length can be more challenging and can develop skills

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $< 40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses
<https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

relevant to professional practice. The Advanced GIS and Web mapping modules provide students with the opportunity to develop applications using network analysis in Advanced GIS and a range of web tools to develop a web mapping site for a local authority. Both tasks are typical of outputs that might be created by a consultancy company. The modules Aerial Photography and Digital Photogrammetry, Applied Earth Observation, and Image Processing & Analysis will assess the operation of image processing systems and the application of the physical principles of remote sensing to specific environmental problems through the production of short reports involving the processing and analysis of image data on the desktop and in the cloud. The environmental remote sensing module provides the supporting statistical skills and practice to enable rigorous image classifications to be performed. The length of each assessment task is clearly stated within the module descriptor and clearly addressed to the module level ILOs. Specific award ILOs apply to different aspects of each of the taught modules, Group Project, and Thesis Project. Students then have opportunities to develop their communication skills, as they are required to give a group presentations within several modules (formative assessment) and individual presentation (summative: Thesis Poster). The ability to work effectively in groups is a highly desirable skill that has translated into all ILOs. Feedback is given immediately after any group presentations. Modules are supported by a number of formative tasks including group discussion, case studies, and oral presentations. Formative feedback is given verbally within the classroom following discussions, and oral feedback provided by the tutor and peers for presentations. Students will also engage with an interactive learning activity that incorporates formative feedback. For all modules peer review informs practice and tutorials guide progress, students are generally encouraged to support each other by asking and answering questions via the VLE. The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during Group Projects and Thesis Project and guidance will be provided through supervisors and induction workshops

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-ENV-INWK	Induction Week	Monica Rivas Casado	33		0	Y		03/10/22	07/10/22	N/A	AO	N/A				N/A	N/A
2	I-GIM-A1131	GIS & Spatial Data Management	Steve Hallett	33		10	N		10/10/22	21/10/22	40	ICW	100				FT 22/10/22 PT 05/11/22	05/23

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Geographical Information Management course specification: Version 1.0 June 2022

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	MC-TRA-01	Scientific Python	Daniel Simms	40		10	N		24/10/22	04/11/22	40	ICW	100				FT 05/11/22 PT 19/11/22	05/23
4	I-GIM-A1135	Aerial Photography & Digital Photogrammetry	Daniel Simms	40		10	N		07/11/22	18/11/22	40	ICW	100				FT 19/11/22 PT 03/12/22	05/23
5	I-GIM-A1130	Applied Earth Observation	Abdou Khouakhi	25		10	N		21/11/22	02/12/22	40	ICW	100				FT 07/01/23 PT 21/01/23	05/23
6	I-GIM-A1129	Image Processing & Analysis	Daniel Simms	42		10	N		05/12/22	16/12/22	40	ICW	100				FT 14/01/23 PT 28/02/2023	05/23
7	I-GIM-A1132	Advanced GIS Methods	Abdou Khouakhi	35		10	N		09/01/23	20/01/23	40	ICW	100				FT 21/01/23 PT 04/02/23	05/23
8	I-GIM-A1133	Environmental Resource Survey	Toby Waine	40	3	10	N		23/01/23	03/02/23	40	ICW	100				FT 04/02/23 PT 18/02/23	05/23

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRA – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Geographical Information Management course specification: Version 1.0 June 2022

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
9	I-GIM-A1136	Web mapping	Steve Hallett	36.5		10	N		06/02/23	17/02/23	40	ICW	100				FT 18/02/23 PT 04/03/23	05/23
10	I-ENV-GRPP	Group Project	Monica Rivas Casado	16		40	Y		20/02/23	05/05/23	50	GCW	64				28/04/23	
											50	GPRES	16				25/04/23	
											50	ICW	10				05/05/23	
											50	RP	10				06/05/23	
11	I-ENV-DISS	Dissertation for part time students	Monica Rivas Casado	10		40	N		20/02/23	22/09/23	50	I PROJ	80				22/09/23 @ 16.00	
												IPRES	20				w/c 25/09/23	
12	I-ENV-THESIS	Individual Research Project	Monica Rivas Casado	20		80	Y		08/05/23	08/09/23	50	THESIS	90				04/09/23	
												OR	10				W/c 28/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRA – Group Practical; I PROJ – Individual Project (>20 credits); G PROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Geographical Information Management course specification: Version 1.0 June 2022

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>

8. How are the ILOs assessed?

The following assessment types are utilised:

Students on the MSc will have seven taught modules assessed as individual coursework, one piece of group project work, and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to assess the ability of the student in a range of environments.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.
2	ICW	ICW	ICW	ICW	ICW	ICW
3	ICW	ICW	ICW		ICW	ICW
4	ICW	ICW	ICW		ICW	ICW
5	ICW	ICW	ICW		ICW	ICW
6	ICW	ICW	ICW		ICW	ICW
7	ICW	ICW	ICW	ICW	ICW	ICW
8	ICW	ICW	ICW	ICW	ICW	ICW
9	ICW	ICW	ICW	ICW	ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7.
910	GPROJ/GCW
11	ICW/RP

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 8.	ILO 9.
12	THESIS	OR

CROSS-MODULAR ASSESSMENT

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

Geographical Information Management course specification: Version 1.0 June 2022

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The career prospects from the course have been excellent. Examples of organisations employing graduates from the course include: Airbus Defence and Security, ESRI, JARIC, local authorities, Natural England, Black and Veatch, universities, research organisations.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2022

1. What is the course?

Course information

Course Title	Global Environmental Change
Course code	MSGECFTC, MSGECPTC PDGECFTC, PDGECPTC PCGECFTC, PCGECPTC
Academic Year	2021-22
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full time, Part time
Location(s)¹ of Study	Cranfield University
School(s)	School of Water, Energy and Environment
Theme	Environment and Agrifood
Centre	Centre for Environmental and Agricultural Informatics
Course Director	Anil Graves
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	NA
Is the Degree apprenticeship integrated or non-integrated?	NA
Is the Mastership offered as an open and/or closed course?	NA

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Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject. Candidates with other qualifications will be considered according to experience. Where applicable minimum IELTS score of 6.5 or TOEFL 580.
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	NA
Registration Period(s) available	Full-time MSc: one year (FT MSc); Part-time MSc: up to three years (PT MSc). Full-time PgCert: one year; Part-time PgCert: two years. Full-time PgDip: one year; Part-time PgDIP: two years.
Course Start Month(s)	Full time: October Part time: October start

Institutions delivering the course

This course is delivered by School of Water, Energy and Environment, Environment and Agrifood Theme, Centre for Environmental and Agricultural Informatics where the research interests include:

Decision science; environmental and agricultural informatics; environmental monitoring; environmental economics; spatial analysis and geographic information systems; atmospheric informatics; plant and soil science; environmental risk assessment; environmental policy; corporate social sustainability; life cycle assessment; remote sensing; decision science, renewable energy technologies; and advanced water management

Cranfield University interacts with the following institutions and in the following ways:

The Programme within which this course sits has an Industrial Advisory Panel (IAP) that formally meets every year to review the courses in the Programme and align them with the key priorities of the industrial sector. The IAP includes representatives from organisations such as: The Joint Research Centre, Geospatial Insight, Chartered Institute of Waste Management, Chartered Institute of Water and Environment Management, ADAS, Environment Agency, Landscape Science Consultancy, Landscape Institute, National Trust, Natural England, Enviro, RSPB, PA Consulting, and Oakdene Hollins. The IAP will help to ensure that the Global Environmental Change MSc is closely aligned with industry needs and objectives to ensure that students are fully prepared for their new careers.

The teaching teams are heavily involved in industrially and externally funded research and consultancy, enabling students to benefit from applied real-world engagement throughout the course. Examples include work with global organisations such as the FAO, World Bank, UNEP, WaterAid, and WHO as well as with UK national organisations such as government departments and their agencies (e.g. Defra, DECC, BEIS, Environment Agency, Natural England, Committee for Climate Change, Food Standards Agency, Health Protection Agency), think tanks (e.g. Green Alliance, Aldersgate Group, Mott MacDonald), and local organisations (e.g. Oxfam, and RSPB, local authorities, and land owners).

This engagement provides a vibrant and applied learning environment through which students benefit during course modules, group projects, and individual projects. Activities include delivery of lectures, webinars, and site visits with external partners, such as the Ellen MacArthur Foundation, Public Health England, Defra, and local companies such as Spedan. Students undertake research projects driven by industry. This includes industrially funded group and individual projects. Examples of group and individual project sponsors include Bedfordshire Local Nature Partnership, Environment Agency, RSPB, Centre for Affordable Water and Sanitation, Ernst and Young, Anglian Water, National Grid, and the Peak District National Park.

The course benefits from links to a significant number of European Universities through the Cranfield University European Partnership Programme.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not currently accredited by any external bodies.

2. What are the aims of the course?

Cranfield University offers this course in order to:

Apply scientific and green engineering principles to address the global and national environmental crises driven by climate change, land use change, pollution emissions, and population growth. Specifically, the MSc will equip students with a unique set of interdisciplinary knowledge and skills to enable them to develop integrated solutions to a wide range of socio-environmental problems in the area of land, water, and society. Students in core modules will address the fundamentals of global environmental change, decision support for environmental solutions, cleantech in the water-energy-food nexus, and sustainable environmental solutions. In elective modules, students will be able to select from issues relating to water and sustainable agrifood systems, good ecological status of water, management of water for droughts and flood, risk communication and perception, environmental policy and risk governance, corporate sustainability, evaluation of environmental sustainability, waste management in a circular economy, land engineering and technologies for seed and crop protection, and atmospheric emissions.

On completion of the course an MSc graduate will be equipped to:

1. develop practical, effective, efficient and lasting solutions for environmental change and sustainable development based on emerging scientific principles, management strategies and technological developments.
2. select and apply appropriate environmental tools and analytical methods to analyse and quantify global environmental challenges, their causes and impacts.
3. apply scientific, technical and sustainability principles, assessing the benefits, consequences, and risks of environmental management options.
4. undertake successful technical research projects using appropriate methods of critical analysis.

This programme is intended for the following range of students:

1. graduates with science, engineering, geography or related degrees keen to pursue careers in global environmental change management
2. graduates currently in employment keen to extend their qualifications or to pursue a career change
3. individuals with other qualifications but who possess relevant experience in the subject area of global environmental change

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Analyse key global environmental challenges and explain their underlying causes, complexity, and implications

- ILO 2. Critically evaluate the strengths and weaknesses of different approaches for informing decision making in complex socio-environmental challenges
- ILO 3. Synthesise data to develop effective solutions for environmental challenges in the land, water, or society sectors

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 4. Integrate knowledge, understanding and skills from taught modules in a real-life situation to address problems faced by industrial clients, creating new problem diagnoses, designs, or systems insights; and communicating findings in a professional manner in written, oral, and visual forms.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.
- ILO 6. Communicate individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

The MSc course is taught in three sections: taught modules (40%), group projects (20%), and an individual research project (40%).

The taught programme, typically delivered between October and February, comprises a structured sequence of modules, each containing a series of lectures and other classroom-based teaching and online learning resources, supplemented by practical work. The taught modules are assessed by assignments. Each 10 credit module is typically taught over one week, usually followed by an assimilation week largely free of structured teaching to allow time for more independent learning and reflection. The teaching in 20 credit modules is spread over four weeks of study, integrating individual, group and classroom based activities. Students commence with taught learning during the Induction week and two core modules. Both the first two modules (Fundamentals of Global Environmental Change and Decision Science for Global Environmental Change) and last two modules (Cleantech in the Water-Energy-Food Nexus and Sustainable Environmental Solutions) form the core of the course and will allow the students to achieve the ILOs for the taught modules. Students additionally select electives from a defined set of modules drawn from the Environment, Agrifood or Water Programmes. The elective modules give the students the opportunity to explore areas of interest that support the achievement of the course ILOs. These are selected either from groups of related modules around the themes of "land", "water", or "society" or by freely choosing from the defined set of elective modules (within timetabling constraints). A personal tutor supports the student when selecting the appropriate modules (a personal tutor will typically have five students in their tutor group). The suite of elective modules are reviewed each year as the SWEE module timetable changes.

The group projects are a group-based research program typically undertaken between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation. Part-time students will typically undertake a dissertation in place of a group project due to their work commitments preventing them from devoting 10 weeks full time work to the group project.

The individual thesis projects, typically delivered between May and September, for full-time students, further develop research and project management skills that: provide the ability to think and work in an original way; contribute to knowledge; overcome genuine problems; and communicate through a thesis and oral exam. Each student is allocated a supervisor, who will guide and assess the student work. Part-time students will typically work on their individual thesis project in years 2 and 3 of their registration period.

Workshops are provided to students as to what is required from the thesis and oral presentation.

Within induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course.

i. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Induction	0
2 Fundamentals of Global Environmental Change	10
3 Decision Science for Global Environmental Change	10
16 Cleantech in the Water-Energy-Food Nexus	10
17 Sustainable Environmental Solutions	10
ELECTIVE MODULES:	
Students complete 20 credits from the following elective modules:	
4 Pollution Prevention and Remediation Technologies	10
5 Water and Sustainable Agrifood Systems	10
6 Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	10
7 Land Engineering Principles and Practices	10
8 Technologies for Seeds and Crop Protection	10
9 Process Emissions and Control	10
10 Good Ecological Status	20
11 Managing Floods and Drought Risk	20
12 Risk communication and Perception	10
13 Environmental Policy and Risk Governance	10
14 Leading Corporate Sustainability	10
15 Evaluating Environmental Sustainability	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

1 Induction	0
2 Fundamentals of Global Environmental Change	10
3 Decision Science for Global Environmental Change	10
16 Cleantech in the Water-Energy-Food Nexus	10
17 Sustainable Environmental Solutions	10
ELECTIVE MODULES:	
Students complete 40 credits from the following elective modules:	
4 Pollution Prevention and Remediation Technologies	10
5 Water and Sustainable Agrifood Systems	10
6 Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	10
7 Land Engineering Principles and Practices	10
8 Technologies for Seeds and Crop Protection	10
9 Process Emissions and Control	10
10 Good Ecological Status	20
11 Managing Floods and Drought Risk	20
12 Risk Communication and Perception	10
13 Environmental Policy and Risk Governance	10
14 Leading Corporate Sustainability	10
15 Evaluating Environmental Sustainability	10
MODULE SUB-TOTAL:	80
GROUP PROJECT/DISSERTATION:	
FULL-TIME STUDENTS:	
18 Group Project	40
PART-TIME STUDENTS:	
18 Group Project OR 19 Dissertation	40
GROUP PROJECT/DISSERTATION SUB-TOTAL:	40
GRAND TOTAL:	
	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
1 Induction	0
2 Fundamentals of Global Environmental Change	10
3 Decision Science for Global Environmental Change	10
16 Cleantech in the Water-Energy-Food Nexus	10
17 Sustainable Environmental Solutions	10
ELECTIVE MODULES:	
Students complete 40 credits from the following elective modules:	
4 Pollution Prevention and Remediation Technologies	10
5 Water and Sustainable Agrifood Systems	10
6 Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	10
7 Land Engineering Principles and Practices	10
8 Technologies for Seeds and Crop Protection	10
9 Process Emissions and Control	10
10 Good Ecological Status	20
11 Managing Floods and Drought Risk	20

12 Risk Communication and Perception	10
13 Environmental Policy and Risk Governance	10
14 Leading Corporate Sustainability	10
15 Evaluating Environmental Sustainability	10
MODULE SUB-TOTAL:	80
GROUP PROJECT/DISSERTATION AND INDIVIDUAL THESIS PROJECT:	
FULL-TIME STUDENTS:	
18 Group Project	40
20 Individual Thesis Project	80
PART-TIME STUDENTS:	
18 Group Project OR 19 Dissertation	40
20 Individual Thesis Project	80
GROUP PROJECT/DISSERTATION AND INDIVIDUAL THESIS PROJECT SUB-TOTAL:	120
GRAND TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

1. An overall average mark of $\geq 50\%$;
2. An average mark of $\geq 50\%$ across the taught assessment;
3. All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
4. **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 1. if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 2. if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 3. it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

5. **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
6. **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

ii. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

Part-time students register for the course in October and are expected to complete the course within 3 years.

Part-time students are expected to start in October. Where this is not possible, they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend and bespoke induction sessions will be arranged as required.

iii. Course Level Assessment Strategy⁴

Formative and summative assessments assist with the delivery of both the course and module level ILOs. Formative assessment for all modules assist the students with their summative assignments. Formative feedback sessions are organised to inform students regarding what they need to do for a good summative assignment, including what they have done well in the formative assessment, and what they need to improve for a good summative assignment.

Modules are organised chronologically so that the student can build on existing skills such that they can enter their chosen career with new skills attained.

There are various methods of formative assessment. All modules contain some form of formative assessment given either by members of the teaching team or by peers. For example, some modules such as "Decision Science for Global Environmental Change" use formative assessments continually throughout the module, whereas others, such as "Fundamentals of Global Environmental Change" deliver formative assessment towards the end of the module in the style of group workshops. In the module "Sustainable Environmental Solutions" formative assessment is carried out during class based exercises, and mini workshops guided by the module leader. The relevance of formative assessment to industry is enhanced by including industrial partners in discussions (for "Pollution Prevention and Remediation Technologies"). In the module "Good Ecological Status" formative assessment also includes feedback during a field visit and lab practical.

There are no exams within this course; all summative assessment is delivered through individual coursework. Exams are not considered to reflect the skills that the students have attained, and do not reflect their ability to utilise resources to integrate knowledge for problem solving. Assignments include casework studies such that students can apply attained knowledge in real industrial scenarios while building on their experience from previous modules. Feedback from summative assessments is delivered to students within 20 working days.

Group Project: The group project provides the students with the opportunity to gain professional skills expected of the workplace. In addition to technical skill practice, students develop a range of soft skills such as team working, problem solving, communication skills and reflective practice. The students work in small consultancy teams typically on a client sponsored project for a period of 10 weeks. Many teams will be made up of students from different courses giving the students the opportunity of working in an interdisciplinary team. The students are responsible for interpreting the brief, developing a project plan, selecting and implementing a methodology, deriving results, analysing the results and drawing conclusions in alignment with the aims and objectives. All students participate in a peer review activity providing them with the opportunity to reflect on the practices of their colleagues as well as their own.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Peer review feedback is provided individually by an independent member of academic staff. A single group report is produced and the project is presented orally at the concluding Exhibition Day, both elements are summatively assessed by independent markers and a group mark is assigned for each element. Individual assessment is derived from supervisor observation and meeting minute actions and an individual reflective report where the students reflect on the development of three soft skill competencies based on objectives that they set for themselves. The team working competency is mandatory as one of the three skills for each student.

Dissertation: Part-time students are not required to complete the Group Project undertaken by the full-time registered students on a SWEE MSc course. An alternative assignment takes the form of a dissertation or design project which in most situations will be based around a topic relevant to the work of the part-time student. It is evident that some aspects of the Group Project experience that the work-based dissertation replaces – for example the client interaction and group dynamics components will not be directly replicated by undertaking this assignment. It is expected that these experiences would normally be a part of the normal working life of the part-time student.

It is expected that the dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation, setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student submits a 6000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.

Individual Research Project/Thesis: The individual research project requires students to further develop problem definition, hypothesis setting, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the course followed by a student. The student is required to communicate their findings successfully via a thesis, written in the style of a scientific paper, and an oral presentation based around a poster. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the group project, to deliver a high quality written thesis and oral presentation. The individual research project/thesis is typically delivered through collaboration with an industrial sponsor, or it may be an 'internal' project reflecting the research interests of the School.

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-ENV-INWK	Induction	Monica Rivas Casado	33		0	Y		03/10/22	07/10/22	N/A	AO	N/A				N/A	N/A
2	New code I-GEC-FGEC	Fundamentals of Global Environmental change	Nick Girkin	30		10	N		10/10/22	14/10/22	40	ICW	100				FT 22/10/22 PT 05/11/22	05/23
3	New code I-GEC-DS	Decision Science for	Alice Johnson	25		10	N		24/10/22	28/10/22	40	ICW	100				FT 05/11/22	05/23

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
		Global Environmental Change															PT 19/11/22		
4	I-IWM-A1061	Pollution Prevention and Remediation Technologies	Fred Coulon	29		10	Y		07/11/22	18/11/22	40	ICW	100					FT 19/11/22 PT 03/12/22	05/23
5	I-FFS-WSS	Water and Sustainable Agrifood Systems	Tim Hess	30		10	Y		07/11/22	18/11/22	40	ICW	100					FT 19/11/22 PT 03/12/22	05/23
6	I-WRM-CRM	Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	Fred Coulon	29		10	Y		21/11/22	02/12/22	40	ICW	100					FT 03/12/22 PT 17/12/22	05/23
7	I-EI-A1004	Land Engineering	Linda Deeks	36		10	Y		05/12/22	16/12/22	40	ICW	100					FT 17/12/22	05/23

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
		Principles and Practices															PT 14/01/23	
8	I-FFS-PBT	Technologies for Seeds and Crop Protection	Zoltan Kevei	20		10	Y		05/12/22	16/12/22	40	ICW	100				FT 17/12/22 PT 14/01/23	05/23
9	I-IWM-A1500	Process Emissions and Control	Zaheer Nasar	25		10	Y		09/01/23	20/01/23	40	ICW	100				FT 21/01/23 PT 04/02/23	05/23
10	I-AWM-GES	Good Ecological Status	Pablo Campo Moreno	60		20	Y		07/11/22	02/12/22	40	ICW	100				FT 03/12/22 PT 07/12/22	05/23
11	I-AWM-MFDR	Managing Flood and Drought Risk	Jerry Knox	60		20	Y		05/12/22	20/01/23	40	ICW	100				FT 21/01/23 PT 04/02/23	05/23
12	I-ERM-A2014	Risk Communication and Perception	Simon Jude	25		10	Y		07/11/22	18/11/22	40	ICW	70				FT 19/11/22 PT 03/12/22	05/23
												GPRES	30				FT 11/11/22	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
																	PT 11/11/22	
13	I-ERM-A2006	Environmental Policy and Risk Governance	Simon Jude	30		10	Y		21/11/22	25/11/22	40	ICW	100				FT 17/12/22 PT 14/01/23	05/23
14	M-T/LCS. Occ B	Leading Corporate Sustainability	Namete Shete	20		10	Y		28/11/22	09/12/22	40	ICW	100				FT 14/01/23 PT 28/01/23	05/23
15	I-EDI-A1127	Evaluating Environmental Sustainability	Chika Miyoshi	30		10	Y		09/01/23	20/01/23	40	ICW	100				FT 21/01/23 PT 04/02/23	05/23
16	I-CTE-CWN	Cleantech in Water-Energy-Food Nexus	Fred Coulon	30		10	Y		23/01/23	03/02/23	40	ICW	100				FT 04/02/23 PT 18/02/23	05/23
17	New code ; I-GEC-SES	Sustainable Environmental solutions	Michelle Cain	30		10	N		06/02/23	10/02/23	40	ICW	100				FT 18/02/23 PT 04/03/23	05/23

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRA – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
18	I-ENV-GRPP	Group Project	Monica Rivas Casado	16		40	Y		20/02/23	05/05/23	50 50	GCW	64				28/04/23 @ 16.00	
												GPRES	16				25/04/23 @ 16.00	
												ICW	10				05.05.23	
												RP	10				06/05/23 @ 23.59	
19	I-ENV-DISS	Dissertation (part-time option)	Monica Rivas Casado	10		40	Y		20/02/23	22/09/23	50	I PROJ IPRES	80 20				22/09/23 wc 25/09/23	Sept 24
20	I-ENV-THESIS	Individual Research Project	Monica Rivas Casado	20		80	Y		08/05/23	08/09/23	50 50	THESIS	90				04/09/23 @ 16.00	
												OR	10				W/C 28/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRA – Group Practical; I PROJ – Individual Project (>20 credits); G PROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-IWM-A1061	Pollution Prevention and Remediation Technologies	Environmental Engineering	Environmental Engineering (Environment)
I-FFS-WSS	Water and Sustainable Agrifood Systems	Future Food Sustainability	Future Food Sustainability (Agrifood)
I-WRM-CRM	Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	Environmental Engineering	Environmental Engineering (Environment) EngD Sustainable Materials and Manufacturing (Manufacturing) Environmental Engineering (Jiangsu)
I-EI-A1004	Land Engineering Principles and Practices	Environmental Engineering	Environmental Engineering (Environment)
I-FFS-PBT	Technologies for Seed and Crop Protection	Future Food Sustainability	Future Food Sustainability (Agrifood)
I-IWM-A1500	Process Emissions and Control	Environmental Engineering	Environmental Engineering (Environment) Environmental Engineering (Jiangsu)
I-AWM-GES	Good Ecological Status	Advanced Water Management	Advanced Water Management (Water) Water WISER (EngD/PhD programmes) WiRe (PhD programme)
I-AWM-MFDR	Managing Flood and Droughts Risk	Advanced Water Management	Advanced Water Management (Water) Water WISER (EngD/PhD programmes) WiRE (PhD programme)
I-ERM-A2014	Risk Communication and Perception	Environmental Management for Business	Environmental Management for Business (Environment)
I-ERM-A2006	Environmental Policy and Risk Governance	Environmental Management for Business	Environmental Management for Business (Environment)
M-T/LCS	Leading Corporate Sustainability	Management	Management (SoM) Management and Corporate Sustainability (SoM) Management and Human Resource Management (SoM)

			Business and Strategic Leadership (SoM) Management and Leadership (SoM) Food Systems and Management (Agrifood) Environmental Management for Business (Environment)
I-EDI-A1127	Evaluating Environmental Sustainability	Environmental Management for Business	Environmental Management for Business (Environment) Future Food Sustainability (Agrifood) EngD Sustainable Materials and Manufacturing (Manufacturing)
I-CTE-CWN	Cleantech in Water-Energy Food Nexus	Environmental Engineering	Environmental Engineering (Environment)

8. How are the ILOs assessed?

The following assessment types are utilised:

1. The taught modules (40%) are assessed by in-module assessment (including coursework, which focuses on application of principles studied knowledge).
2. The group project (20%) is assessed by means of a written group report and presentation, and individual assessment of a students' contribution to the project and a reflective review. Part-time students are typically assessed by a dissertation and oral presentation.
3. The individual research project (40%) is assessed by a thesis and an oral examination.

This approach has been adopted because:

The School of Water, Energy and Environment uses different types of assessments to enable the evaluation of a range of Master's-level skills. A mixture of both individual and group assessments is important in helping students to develop both individual skill and team work related skills. Group and thesis projects follow the completion of the taught part of the course and at this stage more emphasis is on enquiry based learning and problem solving

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

1. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO3.
2	ICW		

Award ILOs Module No.	ILO 1.	ILO 2.	ILO3.
3	ICW	ICW	ICW
4	ICW		ICW
5			ICW
6			ICW
7			ICW
8			ICW
9			ICW
10	ICW		ICW
11	ICW		ICW
12		ICW GPRES	ICW GPRES
13	ICW	ICW	ICW
14		ICW	ICW
15		ICW	ICW
16		ICW	ICW
17	ICW	ICW	ICW

A. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 4.
18	GCW GPRES ICW RP
19	IPROJ IPRES

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 5.	ILO 6.
20	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the

learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

As stated in the SWEE strategic plan 2019/20, the environmental goods and services sector (i.e. green economy) contributes £62.5 bn and 335,000 jobs annually to the UK. Exports from this green economy sector stand at £5 bn per annum. Experts estimate 8,000 to 10,000 green jobs have been opening up each year for the past 10 years. On completion, graduates have a broader network of global contacts, increased opportunities for individual opportunities and a wide range of careers as professional scientists and engineers in the environment sector.

Students can expect to find employment in

1. Government departments and their agencies (e.g. Defra, DECC, BEIS, Environment Agency, Natural England, Food Standards Agency, Health Protection Agency etc.),
2. Think tanks and consultancies (e.g. Green Alliance, Aldersgate Group, Eftec, Deloitte, PWC)
3. NGOs and charities (e.g. World Bank, UNEP, WHO, WaterAid, Oxfam)
4. International agencies (e.g. UN, EU, FAO)

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: April 2022

1. What is the course?

Course information

Course Title	MSc in Global Product Development and Management
Course code	MSGPDFTC, MSGPDPTC, PDGPDFTC, PDGPDPTC, PCGPDFTC, PCGPDPTC
Academic Year	2022/23
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Sustainable Manufacturing Systems Centre
Course Director	Dr Ahmed Al-Ashaab
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	No
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	One year full-time, three years part-time
Course Start Month(s)	Full-time: September. Part-time: throughout the year

Institutions delivering the course

This course is delivered by the School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Sustainable Manufacturing Systems Centre where the research interests include:

- Product Service Systems
- Product Life Cycle Costing
- Lean Product and Process Development
- Knowledge-Based Engineering
- Mathematical Modelling and Optimisation
- Creative Design
- New Manufacturing Technologies
- Industry 4.0

Teaching and/or assessment is also provided by the School of Management and the School of Water, Energy and Environment.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by the following bodies:

- The Institution of Engineering and Technology (IET) until August 2025,
- The Institution of Mechanical Engineers (IMechE) until August 2026
- and the Royal Aeronautical Society (RAeS) until August 2026

Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- Deliver a premium high M-level course which aims at ambitious international students and mid-career professionals who want to boost their career prospects within the global market.
- Introduces cutting edge technology through an industry oriented education scheme.
- Improve the employability of students ready to manage issues arising with an increasingly globalised world.

This programme is intended for the following range of students:

- Mid-career professionals who want to boost their career.
- Ambitious high quality students with an international background.
- Talented students with a high grade BSc level.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Evaluate the up-to-date methods and techniques in global product development and management.
- ILO 2. Assess the use of modern tools to facilitate product engineering, including information systems, management tools and cost engineering software packages.
- ILO 3. Apply the principles of requirements engineering and management to reduce product engineering time and cost.
- ILO 4. .

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Demonstrate knowledge and critical understanding of a broad range of product development approaches.
- ILO 6. Compare state-of-the-art techniques for product development.
- ILO 7. Design new products and services by integrating various knowledge.
- ILO 8. Demonstrate skills to professionally manage culture and communication issues in product development.
- ILO 9. Demonstrate advance international communication skills.
- ILO 10. Demonstrate leadership skills to run individually small international projects.
- ILO 11.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 12. **enter text here**
- ILO 13. Demonstrate knowledge and understanding of facts, concepts, principles and theories and articulate these through reasoned analysis and discussion.
- ILO 14. Analyse the background to an area of research, justify the research methodologies and discuss the main findings and conclusions in a scholarly written report and a viva voce examination.
- ILO 15. Demonstrate the skill to perform a research project in a clear and concise manner.
- ILO 16. Explain and practice the concept of scientific work. This includes that the student will be able to identify new research ideas, concepts or methodologies, develop experiments or case studies, and analyse the results systematically as well as justify the whole process of arriving at the results.
- ILO 17. Produce project aims, objectives, risk assessment and time lines for a research project.
- ILO 18. Write a clear and concise research report using correct citations and showing a systematic structure of thoughts.

4. How is the course taught?

Students will be supported in their learning and personal development by modules given in the form of lecture, group/individual coursework, and personal study based on the materials available through the University's virtual learning environments (VLEs). Following modes of learning will be available depending on the subject:

- Remote on-line education delivered by international lecturers via internet.

- Interactive role plays.
- Mini-group project of 2 days as part of the module (contained within the one week module).
- Students will be provided with pre-course and post-course reading and assessment as dictated by the individual course modules. It is intended that all lecture material will be made available through the VLEs.
- Research and private study is necessary for the successful completion of these projects which also enhances knowledge and individual study abilities.
- Formative feedback on assessed assignments enhances the learning process and informal feedback on non-assessed individual or group exercises are also used.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 (Select 6) Introduction	60 0
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 Group Project (10a) Introduction	80 40 0
TOTAL:	120

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 Introduction	80 0
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	120

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Group Project (10a) Individual Research Project (11)	40
Introduction	80
	0
TOTAL:	200

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Individual Research Project (11)	80
Introduction	0
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);

- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. Typical case is to complete four taught modules plus a Group Project or Dissertation in year 1 and the remainder of the modules plus the Thesis in year two and/or year 3.

7. Course Level Assessment Strategy⁴

The assessment tasks are focused on assessing the learning outcomes of the modules whilst building evidence of the application of skills and understanding of the students. Both formative and summative assessment is utilised in the taught modules.

The assessments are usually based on industrial case studies to align with the purpose of the course – to have hands-on experiences create new generation of product developers who can implement the best practices in their current or future work environment. Taught module assessments are between 3000 and 4000 words depending on the nature and content of the assignment. The students have around six weeks to complete the assessment after module completion. Where relevant, formative feedback is provided verbally during class discussion of module related aspects. Formative assessment is also provided as part of in-module activity that requires individual and group presentation of findings to the class.

The group project is industrial sponsored project dealing with real life issues and challenges that requires the students to work in a team of 5-8 students to deliver a group based report and presentation. The group project also has an individual component that self-gauges the skill development during the course of the project.

The individual project is aligned with the module ILOs which could be an industrial sponsored project or research based one. Students are generally expected to be more self-directed in their learning during this research project with good level of further reading via reviewing the related literature. The individual research project takes the form of a Thesis and students are expected to illustrate and defend their work orally at the end of the project.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-MAT-INWK	Introduction	Dr Sue Impey	39		0	Y	28/09/22	03/10/22	07/10/22	N/A	AO	N/A				N/A	
2	I-ICI-A1019	Design Technology and Prototyping	Mr Paul Lighterness	37		10	N	07/11/22	07/11/22	11/11/22	50	ICW	100				28/11/22	Re-assessment date to be set by agreement of the Module Leader as/when required.
3	I-MNU-A1034	Operations Management	Dr Mohamed Afy-Shararah	32		10	Y	10/10/22	10/10/22	14/10/22	50	EX	100				12/12/22	Manufacturing resit exams will be

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
																	during week commencing: 15/05/23	
4	I-MNU-A1038	Supply Chain Management	Mr John Patsavellas	32		10	Y	09/01/23	09/01/23	13/01/23	50	GCW	100				06/02/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
5	I-KME-A1022	Design Driven Innovation Processes	Dr Ahmed Al-Ashaab	32		10	Y	31/10/22	31/10/22	04/11/22	50	GCW	100				28/11/22	Re-assessment date to be set by agreement of the Module Leader as/when required.
6	I-MNU-A1018	General Management	Dr Claudiu Giusca	32		10	Y	28/11/22	28/11/22	02/12/22	50	EX	100				06/01/23	Manufacturing resit exams will be during week commencing: 15/05/23
7	I-GPD-A1505	Lean Product Development	Dr Ahmed Al-Ashaab	32		10	Y	16/01/23	16/01/23	20/01/23	50	GCW	100				13/02/23	Re-assessment date to be set by agreement of the Module

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
																		Leader as/when required.
8	I-KME-A1037	Enterprise Modelling	Dr John Ahmet Erkoyuncu	32		10	Y	21/11/22	21/11/22	25/11/22	50	GCW	100				04/01/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
9	I-GPD-A1507	Digital Engineering	Dr John Ahmet Erkoyuncu	32		10	Y	17/10/22	17/10/22	21/10/22	50	GCW	100				18/11/22	
10a	I-MAT-GRPP	Group Project	Dr David Ayre	20		40	Y	30/01/23	30/01/23 Occ A FT	25/04/23 FT	50	GPRES GPROJ ICW IPRAC	16 64 10 10				25/04/23 02/05/23 02/05/23 02/05/23	
			Dr Iva Chianella						06/02/23 Occ B PT	01/08/23 PT	50	GPRES GPROJ ICW IPRAC	16 64 10 10				25/07/23 01/08/23 01/08/23 01/08/23	
10b	I-MAT-DISS	Dissertation for Part Time Students	David Ayre/ Dr Sue Impey	20		40	Y	06/02/23	06/02/23	25/08/23	50	ICW ICW	90 10				25/08/23 25/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan Dr Muhammad Khan	20		80	Y	06/02/23	Occ A = PT 06/02/23	PT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	
								28/04/23	Occ B = FT 28/04/23	FT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAT-INWK	Introduction	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Aerospace Manufacturing, Engineering & Management of Manufacturing Systems, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering & Asset Management
I-GPD-A1505	Lean Product Development	Global Product Development and Management	Manufacturing Technology and Management, Water – WIRE CDT
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Management and Information Systems, Manufacturing, Aerospace Management, Metal Additive Manufacturing, Manufacturing Technology and Management
I-MNU-A1038	Supply Chain Management	Engineering and Management of Manufacturing Systems	Aerospace Management, Management and Information Systems,
I-MNU-A1018	General Management	Manufacturing Technology and Management	Advanced Materials,
I-KME-A1037	Enterprise Modelling	Management and Information Systems	Management and Information Systems
I-MAT-DISS	Dissertation for Part Time Students	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Aerospace Manufacturing, Engineering & Management of Manufacturing Systems, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering & Asset Management
I-MAT-GRPP	Group Project	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Engineering & Management of Manufacturing Systems, Management and Information Systems, Aerospace Manufacturing, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering & Asset Management
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing,	Engineering & Management of Manufacturing Systems,

			Management and Information Systems, Aerospace Materials, Manufacturing Technology & Management, Welding Engineering, Metal Additive Manufacturing, Advanced Materials, Maintenance Engineering & Asset Management
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8. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have 3 written examinations (Operation Management, General Management, and Decision Engineering), 5 pieces of assessment by submitted work and 2 elements of assessment by presentation or viva. The course is assessed as three elements:

- Taught modules (40%) are assessed by in-module assessment (including coursework, which focuses on application of principles studied and class tests, which support underpinning knowledge) or examination;
- Group project (20%) is assessed by means of a written group report and presentations.
- Individual thesis project (40%) is assessed by a thesis and an oral examination.

This approach has been adopted because the course focuses on product development that requires coursework. Assignment type assessment is the best for such modules.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5
2		ICW	ICW	ICW	
3	EX				EX
4	GCW	GCW	GCW		GCW
5	GCW	GCW	GCW		GCW
6	EX				
7	GCW	GCW	GCW		GCW
8	GCW	GCW		GCW	
9	GCW	GCW		GCW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12
10a	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW
10b	ICW	ICW	ICW	ICW	ICW	ICW	ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19
11	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course is designed to equip the students with all the knowledge and skills necessary to work successfully in integrated international project teams. The close collaboration of the course with industry improves the employability of the students immediately. Exposing students to well-known industry broadens the student's horizon and introduces the student to industrial best practice. Working with worldwide well-known brands improves the vita of the students. A placement within industry also leverages the distance between the potential new employee – the student – and the potential employer.

In addition, the qualification obtained will support their professional development towards Incorporated or Chartered Engineer status (after accreditation).

Annex A: AHEP Mapping¹²

Module Code		<u>I-ICI- A1019</u>	<u>I-MNU- A1034</u>	<u>I-MNU- A1038</u>	<u>I-KME- A1022</u>	<u>I-MNU- A1018</u>	<u>I-GPD- A1505</u>	<u>I-KME- A1037</u>	<u>I-GPD- A1507</u>	<u>I-MAT- GRPP</u>	<u>I-MNU- THESIS</u>	<u>I-MAT- DISS</u>
Learning Outcomes												
Science and Mathematics	SM7M		<u>C</u>						<u>C</u>	<u>C</u>	<u>C</u>	<u>O</u>
	SM8M				<u>C</u>					<u>C</u>	<u>C</u>	<u>O</u>
	SM9M			<u>C</u>			<u>C</u>		<u>C</u>	<u>C</u>	<u>C</u>	
Engineering Analysis	EA6M				<u>C</u>		<u>C</u>	<u>C</u>		<u>C</u>	<u>C</u>	
	EA5m						<u>C</u>			<u>C</u>	<u>C</u>	<u>O</u>
	EA7M			<u>C</u>	<u>C</u>			<u>C</u>		<u>C</u>	<u>C</u>	<u>O</u>
Design	D9M	<u>C</u>		<u>C</u>	<u>C</u>		<u>C</u>			<u>C</u>	<u>C</u>	<u>O</u>
	D10M	<u>C</u>			<u>C</u>		<u>C</u>					<u>O</u>
	D11M	<u>C</u>			<u>C</u>		<u>C</u>					<u>O</u>
Economic, Legal, Social, Ethical and Environmental Context	EL8M					<u>C</u>				<u>C</u>	<u>C</u>	
	EL9M			<u>C</u>	<u>C</u>	<u>C</u>		<u>C</u>		<u>C</u>	<u>C</u>	
	EL10M		<u>C</u>	<u>C</u>		<u>C</u>				<u>C</u>	<u>C</u>	<u>O</u>
	EL11M	<u>C</u>				<u>C</u>	<u>C</u>					
	EL12M					<u>C</u>				<u>C</u>	<u>C</u>	
	EL13M		<u>C</u>	<u>C</u>			<u>C</u>			<u>C</u>	<u>C</u>	
Engineering Practice	P12M						<u>C</u>			<u>C</u>	<u>C</u>	
	P9m								<u>C</u>	<u>C</u>	<u>C</u>	
	P10m		<u>C</u>							<u>C</u>	<u>C</u>	
	P11m					<u>C</u>	<u>C</u>			<u>C</u>	<u>C</u>	
Additional General Skills	G1						<u>C</u>	<u>C</u>	<u>C</u>	<u>C</u>	<u>C</u>	<u>O</u>
	G2									<u>C</u>	<u>C</u>	<u>O</u>
	G3m									<u>C</u>	<u>C</u>	<u>O</u>
	G4							<u>C</u>		<u>C</u>	<u>C</u>	<u>O</u>

¹² When completing the matrix each module on the course should be listed across the top row of the matrix. C (Core) or O (Optional) should be entered against the learning outputs that each module meets.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: September 2022

1. What is the course?

Course information

Course Title	Guided Weapon Systems
Course code	MSGWSFTR, PDGWSFTR, PCGWSFTR, MSGWSPTR, PDGWSPTR, PCGWSPTR SPGWSPTR
Academic Year	2022/23
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time/Part time
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence & Security
Theme	Defence and Security
Centre	Centre for Defence Engineering
Course Director	Dr David Galvão Wall
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University entry requirements; additionally an IELTS score of 7.0 is usually required by students for whom English is not a first language.
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	1 year Full-time, 5 years Part-time
Course Start Month(s)	September

Institutions delivering the course

This course is primarily delivered by the Cranfield School of Defence and Security, where the research interests include:

GW control, guidance, propulsion, aerodynamics, EO/IR systems, imaging systems, radar systems, warheads, materials, vibrations, aeroelasticity, lethality etc.

Cranfield University interacts with the following institutions (subject to security clearances and availability of visit) and in the following ways:

- Industrial visits to: MBDA (Bolton), Dstl (Portsmouth West), Roxel (Summerfield), Thales (Belfast and Basingstoke), Royal Navy (HMS Collingwood and Portsmouth Dockyard), DI (London).
- Industrial lectures from MBDA and Thales on the subjects of project management, fuzing, systems engineering, software engineering and GW electronics engineering.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

Royal Aeronautical Society (RAeS) until August 2023 on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng). Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

The aim of the course is to provide students with a detailed knowledge and understanding of guided weapon systems, such that they are fully equipped for roles in defence intelligence and acquisition, involving the specification and analysis of such systems, working individually or as part of a team. It also enables students to carry out an in-depth investigation into an area of GW technology to further enhance their analytical capability.

The main objective of the course is to bring together the wide variety of disciplines constituting guided weapons technology and to present them in an integrated manner. Interactions between one field and another are emphasized throughout. The GWS course is now in its 71st consecutive year and satisfies a requirement for specialists trained in the field of guided weapons systems. Graduates of this course go on to work in defence analysis and intelligence, research establishments and education in the UK and abroad. It attracts students from RN, RAF and civil services in the UK, and increasingly from a number of other IDT-cleared countries, including Australia, Canada, USA, Greece, Netherlands, Brazil, India and Italy, and is seen as an essential prerequisite for a number of RAF, RN and RAAF jobs. The only other course of its kind is at the Naval Postgraduate School, Monterey in California (which runs over 2 years).

The number of students attending the course has been reasonably consistent over the past ten years, typically ten to thirteen students per year, roughly 50% UK and 50% overseas. It has many parallels with

the Military Electronics Systems Engineering (MESE) course at Shrivenham and also shares several modules with it.

This programme is intended for the following range of students:

It is of primary benefit to services personnel who are about to be posted into GW-related positions with organizations such as DI, DSTL and DE&S (and their international equivalents). It would also be eminently suitable for anyone intending to embark upon a GW-based career in industry.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate in depth knowledge and understanding of the key technical disciplines required for guided weapon analysis.
- ILO 2. Numerically analyse missile subsystems and evaluate their capabilities/performance as part of a guided weapon.
- ILO 3. Defend and justify design decisions using appropriate numerical analysis, both in written and oral form.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 4. Design experiments/simulations to test both theoretical knowledge and physical systems and evaluate the results.
- ILO 5. Analyse specific target and threat types to justify appropriate strategies and inform missile subsystem selection criteria.
- ILO 6. Evaluate the interlinked constraints between disciplines to analyse the design drivers and trade-offs between missile subsystems.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Critically evaluate existing methods and techniques in missile design, analysis and operation both at system and subsystem level.
- ILO 8. Synthesise new tools and methods for missile or missile subsystem design, analysis and operation.
- ILO 9. Appraise, assess and document an extended research project in the field of GW requiring elements of information retrieval, modelling, experimentation and theoretical analysis.]

4. How is the course taught?

Although the course is specified and described in modular terms, these modules will be integrated as best as practicably possible into a continuous taught phase (for those enrolled on the Full-Time MSc programme). Apart from standard academic lectures, course delivery also includes the following:

- Numerous visits to a wide variety of relevant industrial and military establishments: MBDA (Stevenage), Dstl (Portsmouth West), Roxel (Summerfield), Thales (Belfast and Basingstoke), Royal Navy (HMS Collingwood and Portsmouth Dockyard), DI (London). These visits will be scheduled as far as practicably possible to maximise possible attendance by Part-Time students (within applied security classification limitations). They are intended to enhance student's understanding of GW-related subject areas but are not assessed.
- Visiting lecturers (industry) using appropriate subject matter experts (project management, systems engineering, software engineering, electronics engineering, etc.).
- A parametric study (software-based missile design exercise).
- Tutorials (complete missile design exercises).
- Comprehensive use of the Virtual Learning Environment (VLE), with an increasing tendency towards Technology Enhanced Learning (TEL) methods. This is especially pertinent for the "Introductory & Foundation Skills" module, largely comprising studies in maths and Matlab/Simulink programming, along with the necessary induction sessions regarding the Library, IT, VLE, Turnitin, etc. It is envisaged that much of this module will be delivered via pre-reading and VLE means, with self-assessment in the future. It is appreciated that changes will be introduced into the Course Management with the introduction of the Part-time course options, particularly regarding student experience and progression. The Course Team will be appreciative of this and take appropriate measures to minimise any detrimental effects to the students. This will be done through the Course Director keeping in contact with the part-time students and having regular meetings and consultation with appropriate members of the SAS team and Academic Registry.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 2. GW Propulsion	10
Module 3. GW Aerodynamics	10
Module 4. GW Control Theory	10
Module 5. EO & IR Systems 1	10
Module 6. Radar Principles	10
ELECTIVE MODULES:	

Module 7. GW Control & Guidance - must be taken after pre-requisite module 4	10
Module 8. GW Energetics	10
Module 9. GW Structures, Aeroelasticity & Materials	10
Module 10. Signal Processing, Statistics & Analysis	10
Module 11. Radar EW - must be taken after pre-requisite module 6	10
Module 12. EO & IR Systems 2	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 130 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 2. GW Propulsion	10
Module 3. GW Aerodynamics	10
Module 4. GW Control Theory	10
Module 5. EO & IR Systems 1	10
Module 6. Radar Principles	10
Module 7. GW Control & Guidance - must be taken after pre-requisite module 4	10
Module 8. GW Energetics	10
Module 9. GW Structures, Aeroelasticity & Materials	10
Module 10. Signal Processing, Statistics & Analysis	10
Module 12. EO & IR Systems 2	10
Module 14. Missile System Design	20
ELECTIVE MODULES:	
Module 11. Radar EW - must be taken after pre-requisite module 6	10
Module 13. Hypersonic GW – must be taken after pre-requisite modules 2, 3 and 4.	10
TOTAL:	130

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 2. GW Propulsion	10
Module 3. GW Aerodynamics	10
Module 4. GW Control Theory	10
Module 5. EO & IR Systems 1	10
Module 6. Radar Principles	10
Module 7. GW Control & Guidance - must be taken after pre-requisite module 4	10
Module 8. GW Energetics	10
Module 9. GW Structures, Aeroelasticity & Materials	10
Module 10. Signal Processing, Statistics & Analysis	10
Module 12. EO & IR Systems 2	10
Module 14. Missile System Design	20

Module 15. Research Project Module 16. GW – Propulsion and Aerodynamics Applications (Certain specific legacy students only – Replacement for Module 3)	70 (10)
ELECTIVE MODULES:	
Module 11. Radar EW - must be taken after pre-requisite module 6	10
Module 13. Hypersonic GW – must be taken after pre-requisite modules 2, 3 and 4.	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

Part-time students register for the course in September and are expected to complete the course within 5 years. The maximum registration period for the Part-Time MSc programme is five years.

Each 10-credit module is taught over a single week, with the following week kept free of structured teaching (where possible) to allow time for more independent learning and reflection, especially for the Full-time students. Most industrial visits, if appropriate, are also scheduled for the second week, with Part-Time students offered the opportunity to attend as far as practicably possible. The main exception is the 20-credit Missile System Design module, which runs over two weeks, and has associated seminars outside of the residential period.

A thesis workshop will be programmed into the course schedule in March, which will generally be suitable for all Full-time and most Part-time students. A separate workshop will be organised, in September, for Part-time students for which this scheduling is deemed to be unsuitable. The Full-time course is generally structured in three distinct and chronological phases: firstly “theory and application” modules, secondly “systems” modules and thirdly the research project. There are some cases where a module may only be taken after its relevant pre-requisite module. The module descriptors will reflect all such pre-requisites. In particular they are:

- Radar Principles is a pre-requisite for Radar EW.
- GW Control Theory is a pre-requisite for GW Control & Guidance.
- GW Propulsion, GW Aerodynamics and GW Control Theory are pre-requisites for Hypersonic GW.
- All compulsory modules are prerequisites for Missile System Design.

The course structure (module breakdown) for both the Full-time and Part-time versions of the PgCert, PgDip and MSc qualifications are as follows:

PgCert Guided Weapon Systems (60 credits)

- **Compulsory Modules**

Module 1: Introductory & Foundation Studies (zero credits)

Module 2. GW Propulsion

Module 3. GW Aerodynamics

Module 4. GW Control Theory

Module 5. EO & IR Systems 1

Module 6. Radar Principles

- **Elective Modules**

Plus ONE of the following modules:

Module 7. GW Control & Guidance - must be taken after pre-requisite module 4

Module 8. GW Energetics

Module 9. GW Structures, Aeroelasticity & Materials

Module 10. Signal Processing, Statistics & Analysis

Module 11. Radar EW - must be taken after pre-requisite module 6

Module 12. EO & IR Systems 2

Typical 3 Year (Part-Time) PgCert Programme Plan

The following plan shows how a typical part-time student could complete the PgCert programme within a three year time-frame, though there are many other ways in which this could be done, dependent on an individual's elective module selection.

- Year 1:
 - Module 1: Introductory & Foundation Studies (September)
 - Module 3. GW Aerodynamics (November)
- Year 2:
 - Module 2. GW Propulsion (September)
 - Module 4: GW Control Theory (November)

- Year 3:
 - Module 5. EO & IR Systems 1 (October)
 - Module 6. Radar Principles (November)
- Year 1, 2 or 3
 - Modules 7-12. ONE Elective Module (October or December-February)

PgDip Guided Weapon Systems Candidates (130 credits)

- **Compulsory Modules**
 - Module 1: Introductory & Foundation Studies (zero credits)
 - Module 2. GW Propulsion
 - Module 3. GW Aerodynamics
 - Module 4. GW Control Theory
 - Module 5. EO & IR Systems 1
 - Module 6. Radar Principles
 - Module 7. GW Control & Guidance - must be taken after pre-requisite module 4
 - Module 8. GW Energetics
 - Module 9. GW Structures, Aeroelasticity & Materials
 - Module 10. Signal Processing, Statistics & Analysis
 - Module 12. EO & IR Systems 2
 - Module 14. Missile System Design
 - Module 15. Research Project
- **Elective Modules**

Plus ONE of the following modules:

 - Module 11. Radar EW - must be taken after pre-requisite module 6
 - Module 13. Hypersonic GW – must be taken after pre-requisite modules 2, 3 and 4.

Typical 4 Year (Part-Time) PgDip Programme Plan

Follow the below MSc guidance minus the Research Project.

MSc Guided Weapon Systems (200 credits)

All of the above compulsory PGDip modules, ONE elective PGDip module, plus an individual project

Typical 5 Year (Part-Time) MSc Programme Plan

The following plan shows how a part-time student could complete the MSc programme within a five-year time frame.

- Year 1:
 - Module 1: Introductory & Foundation Studies (September)
 - Module 10: Signal Processing, Statistics & Analysis (October)
 - Module 4: GW Control Theory (November)
 - Module 8. GW Energetics (December)
 - Module 9. GW Structures, Aeroelasticity & Materials (January)
- Year 2:
 - Module 2. GW Propulsion (September)
 - Module 5. EO & IR Systems 1 (October)
 - Module 3. GW Aerodynamics (November)
 - Module 12. EO & IR Systems 2 (January)
- Year 3:
 - Module 6. Radar Principles (October)
 - Module 7. GW Control & Guidance (February)
 - Module 11 or 13: Radar EW (February) or Hypersonic GW (March)
- Year 4:
 - Select Research Project (January to July)
 - Module 14: Missile System Design (March)

- Year 5:
 - Thesis workshop (September)
 - Complete Research Project (January to July)

7. Course Level Assessment Strategy

The assessment strategy for the Guided Weapon Systems MSc programme has three broad objectives. The assessments throughout the course are intended to satisfy the learning outcomes to enable the award of an M-level degree, as well as the competencies and skills development required by the UK Engineering Council. Secondly, since the course is sponsored by the MOD, the assessments are designed to certify that graduates have the required knowledge and skills in the subject to actively work in the Guided Weapons community. Finally, the assessments and their associated feedback are designed to facilitate students' reflective learning.

Guided Weapon Systems is a multidisciplinary programme, where each module relates to a different discipline. It is not possible for different modules to target specific course-level ILOs. Rather, each module assesses the student on several of the course-level ILOs but relating to the specific module content. The course uses a variety of assessment methods to challenge the students and enable them to demonstrate a full range of skills and attributes. Several of the modules require submission of a written piece of work as a technical report or an essay. These will be of varying lengths, recognising that writing articles to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is clearly stated within the module descriptor. This allows the student to develop their critical thinking and presentation of arguments in a written mode, as well as developing their technique at presenting information in a practical and scientific way for both expert and non-expert audiences. This type of assessment is used to determine a student's competence in relation to lab-based activities, numerical analysis and research of existing and future technologies and approaches. In general, the submission of reports and essays is required to address course level ILOs 1 to 6 in various modules.

Modules 2, 3, 4 and 14 are assessed by oral exam, or viva voce. These assessments are intended to develop the student's communication skills. Through practice prior to the examinations and formative feedback, alongside the summative assessment, students will develop their practice in expressing complex, scientific, and technical concepts clearly and succinctly in high pressure situations, to both expert and non-expert audiences. This is a relevant professional skill to many of the job roles students are required to take upon graduation from the programme. Modules 7 and 9 are assessed by written exam. This mode of assessment is used primarily as a rigorous certification of a student's knowledge of a subject, numeracy skills, and their ability to handle significant time pressures. Both the oral exams and written exams are intended to assess course level ILOs 1, 2 and 3.

Students have further opportunity to develop their communication skills, as they are required to give both a group presentation for module 14 and an individual presentation for module 15 as formative assessment. The ability to work effectively in groups is a highly desirable skill though it is not being summatively assessed as part of the course. The Missile System Design module contains a parametric study exercise, which involves the numerical design and analysis of a complete missile system. This type of activity is a significant undertaking and requires a deep understanding of all the required engineering disciplines. Due to time constraints it is impractical as an individual assessment therefore the activity is assessed as a group. Formative feedback is given immediately after the group presentation, which can be used to enhance the coursework submission. All modules are further supported by a number of other formative tasks including group discussion, case studies and oral presentations. Formative feedback is given verbally within the classroom following discussions, via a written summary from the module leader in the case of written work and oral feedback provided by the tutor and peers for presentations. Some modules have the requirement of compulsory written coursework submissions that are not assessed summatively but are used to provide formative feedback and serve as enhanced pre-work for later modules. The critical analysis and evaluation skills developed through the formative coursework in modules 2, 3 and 4 provides students with the tools required to

successfully carry out independent analytical research and write detailed technical reports, both in later summative assessment and as graduates of the course.

The research project addresses course level ILOs 7 to 9 and takes the form of a thesis, which incorporates ongoing formative feedback in the form of one-to-one supervisory interactions between student and advisor, and some limited advice when writing the thesis document.

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
													Type of Assessment	Weighting within module ⁷ (%) of	Weighting within module of multi-part assessment ⁸	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
1		R-GWS-IFS	Introductory and Foundation Studies A22	Dr D Galvão Wall	20		0	N	05/09/22	05/09/22	09/09/22	N/A	AO	N/A				N/A	
2		R-GWS-PRP	Guided Weapon Propulsion A22	Laura Lacey	28		10	N	19/09/22	19/09/22	23/09/22	50	OR	100				07-08/11/22 (FT & PT)	TBC
3		R-GWS-AER	Guided Weapon Aerodynamics A22	Dr A J Saddington	28		10	N	31/10/22	31/10/22	04/11/22	50	OR	100				07-08/12/22 (FT & PT)	TBC

⁴ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁵ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁶ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁷ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁸ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

⁹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁰ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of	Weighting within module ⁷ (%) of	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
4		R-GWS-GWCT	Guided Weapon Control Theory A22	Dr D Galvão Wall	30		10	N	28/11/22	28/11/22	02/12/22	50	OR	100				04-05/01/23 (FT & PT)	TBC
5		R-MES-EOIS1	Electro-Optics & Infrared Systems 1 A22	Dr A Khalid	32		10	Y	17/10/22	17/10/22	21/10/22	50	ICW	100				18/11/22 (FT & PT)	TBC
6		R-MES-RP	Radar Principles A22	Dr A Balleri	30		10	Y	14/11/22	14/11/22	18/11/22	50	ICW	100				16/12/22 (FT & PT)	TBC
7		R-GWS-CG	Guided Weapon Control & Guidance A22	Dr J T Economou/ Dr D Galvão Wall	30		10	N	20/02/23	20/02/23	24/02/23	50	EX	100				16/03/23 (FT & PT)	TBC
8		R-GWS-ENER	Guided Weapon Energetics A22	Mr S Champion	30		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100				27/02/23 (FT & PT)	TBC
9		R-GWS-SAM	Guided Weapon Structures, Aeroelasticity and Materials A22	Dr G Kister	30		10	N	12/12/22	12/12/22	16/12/22	50	EX	100				19/01/23 (FT & PT)	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of	Weighting within module ⁷ (%) of	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
10		R-MES-SPSA	Signal Processing, Statistics & Analysis A22	Dr P Barker	30		10	Y	03/10/22	03/10/22	07/10/22	50	ICW	100				04/11/22 (FT & PT)	TBC
11		R-MES-REW	Radar Electronic Warfare A22	Mr I Vagias	30		10	Y	30/01/23	30/01/23	03/02/23	50	ICW	100				03/03/23 (FT & PT)	TBC
12		R-MES-EOIS2	Electro-Optics and Infrared Systems 2 A22	Dr L Chermak	32		10	Y	09/01/23	09/01/23	13/01/23	50	ICW	100				10/02/23 (FT & PT)	TBC
13		R-GWS-HYPER	Hypersonic Guided Weapons A22	Dr A J Saddington	33		10	N	06/03/23	06/03/23	10/03/23	50	ICW	100				17/04/23 (FT) 02/05/23 (PT)	TBC
14		R-GWS-MSD	Missile System Design A22	Dr D Galvão Wall	80		20	N	20/03/23	20/03/23	31/03/23	50	OR	50				26-27/04/23 (FT & PT)	TBC
												50	ICW	50				05/05/23 (FT) 19/05/23 (PT)	TBC TBC
15		R-GWS-THESIS	Research Project A22	Dr D Galvão Wall	3		70	N	06/01/23 (FT & PT)	06/01/23 (FT & PT)	31/07/23 (FT & PT)	50	THESIS	100				31/07/23 (FT & PT)	N/A

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
													Type of Assessment	Weighting within module ⁷ (%) of	Weighting within module ⁷ (%) of	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
Legacy Students ONLY (Req TBC)																			
16		R-GWS-GWAPA	GW – Propulsion and Aerodynamics Applications A22	Alistair Saddington	28		10	N	TBC	TBC	TBC	50	ICW	100				N/A (FT) TBC (PT)	N/A TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-MES-SPSA	Signal Processing, Statistics & Analysis	Military Electronic Systems Engineering	Guided Weapon Systems & AeroSystems
R-MES-EOIS1	Electro-Optics & Infrared Systems 1	Military Electronic Systems Engineering	Guided Weapon Systems & AeroSystems
R-MES-RP	Radar Principles	Military Electronic Systems Engineering	Guided Weapon Systems & AeroSystems
R-MES-REW	Radar Electronic Warfare	Military Electronic Systems Engineering	Guided Weapon Systems & AeroSystems
R-MES-EOIS2	Electro-Optics & Infrared Systems 2	Military Electronic Systems Engineering	Guided Weapon Systems & AeroSystems

8. How are the ILOs assessed?

The course uses a wide range of assessment types. Students can expect to have written examinations (closed-book), oral examinations (in the subjects of propulsion, aerodynamics, control and missile system design) and a large number of submitted work assessments. There will also be some group activities, e.g. in the Radar Principles and Missile System Design modules. The individual project will be assessed via dissertation submission. This provides a balanced approach to the overall course assessment.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate & Postgraduate Diploma

The Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	PgCert			PgDip		
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1	AO	AO		AO		
2	OR	OR	OR			OR
3	OR	OR	OR			OR
4	OR	OR	OR			
5	ICW	ICW	ICW			

Award ILOs Module No.	PgCert			PgDip		
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
6	ICW	ICW	ICW	ICW		
7	EX	EX	EX	EX	EX	EX
8	ICW	ICW	ICW	ICW	ICW	ICW
9	EX	EX	EX	EX	EX	EX
10	ICW	ICW	ICW			
11	ICW	ICW	ICW		ICW	
12	ICW	ICW	ICW		ICW	
13	ICW	ICW	ICW		ICW	ICW
14	OR & ICW	ICW	OR & ICW	ICW	OR & ICW	ICW

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 8	ILO 9
15	THESIS	THESIS	THESIS

C. Bespoke GWAPA Module mapping

Award ILOs Module No.	PgCert			PgDip		
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
16	ICW	ICW			ICW	

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Nearly all students in recent years have been directly sponsored to undertake the course with a subsequent specific weapons-related position in mind. It is envisaged that this will remain the case in the foreseeable near and mid-terms, though the availability of PgCert and PgDip exit routes, and the possibility for taking the course on a Part-Time basis, may eventually change the nature of the student profile. The field of guided weapon systems technology is ever-changing and there are many opportunities within industrial companies (such as Thales and MBDA in the UK) for successful GWS students.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: April 2022

1. What is the course?

Course information

Course Title	Information Capability Management
Course code	MSICMFTR – PDICMFTR – PCICMFTR – MSICMPTR - PDICMPTR- PCICMPTR - SPICMPTR
Academic Year	2022/23
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time, and short course for credit
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Centre for Electronic Warfare, Information and Cyber
Course Director	Miss Antoinette Caird-Daley
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	Benchmarked against Subject Benchmark Statement for Computing (Master's)
Registration Period(s) available	Full-time: A student will have a registration period of one year. Part-time: A student will have a registration period of up to five years for an MSc, four years for a PgDip, and three years for a PgCert.
Course Start Month(s)	Full-time and Part-time - September Part-time - January

Institutions delivering the course

This course is delivered by Cranfield Defence and Security, Centre for Electronic Warfare, Information and Cyber, where the research interests associated with the course include Information Management, Human Factors, Information Systems (IS) and Systems Thinking.

Cranfield University interacts with the following institutions and in the following ways:

- Guest lecturers are drawn from other academic institutions and the practitioner community.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The course is accredited formally by the British Computer Society (BCS) up to and including academic year 2022/23. The course is also accredited by the Chartered Institute of Library and Information Professionals (CILIP).

2. What are the aims of the course?

Cranfield University offers this course in order to achieve the following aims:

- To provide students with a broad base of information system (IS) and management theories, concepts, applications and techniques in order to contribute to IS provision in support of an organisation's business goals.
- To develop or enhance professional competence and agility in individuals who wish to become senior managers who can master the disciplines of both business and information.
- To develop students' ability through comprehensive analysis and synthesis of key issues and specific areas of interest that will enable them to be effective within the IS profession.
- To provide students with a knowledge of information systems, management theories and enabling technologies along with the skills to critically analyse their practical application in order to support business goals.
- To develop the skills to work with others in a team based environment.
- To enable optimum effectiveness through conceptualisation, abstraction, and evaluation of complex often competing requirements, constraints and imperatives from a variety of stakeholders in order to exercise informed professional IS judgement.

Additional MSc Aims

- To enhance and synthesise independent learning abilities.
- To apply critical appraisal skills to research and analyse a relevant information system issue, challenge or opportunity in an evidence based dissertation.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) entry routes are provided for students who wish to access only parts of the Course provided.

This programme is intended for the following range of students:

- Personnel from the Ministry of Defence.
- Personnel from Government bodies.
- Employees from industry.
- People wishing to develop the skills and knowledge associated with development of business systems.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate/Postgraduate Diploma

In completing this course, and achieving the associated award, a diligent student should be able to:

- | | |
|---------|---|
| ILO 1. | Analyse the conceptualisation of the information systems environment in the UK specifically and more generally in a global context. |
| ILO 2. | Compare contemporary IS methodology and their applicability to the development of strategy and systems. |
| ILO 3. | Distinguish the nature and impact of project management on the effective delivery and operation of information systems. |
| ILO 4. | Outline contemporary emerging technology and illustrate its application to a range of scenarios. |
| ILO 5. | Critically evaluate requirements within selected business environments (including legal and ethical) in order to best support business process with information systems. |
| ILO 6. | Demonstrate synthesis and evaluation in the consideration of key approaches to strategic information system development. |
| ILO 7. | Develop representational models of information system processes and apply them within the strategic information system development environment. |
| ILO 8. | Critically analyse information from disparate sources synthesising unique interpretation. |
| ILO 9. | Demonstrate the ability to work within teams, communicating and collaborating in order to develop solutions to information systems challenges. |
| ILO 10. | Utilise value judgement to act as an informed customer in information system discussions. |
| ILO 11. | Apply relevant theories, concepts and techniques in the development of information systems in an integrated team based environment. |
| ILO 12. | Critically analyse risk and uncertainty, undertaking alleviation action (including system protection and security) in order to achieve cost effective and timely performance. |
| ILO 13. | Develop and prioritise strategies and approaches that develop and enhance effective information systems. |

- ILO 14. Evaluate influences, and apply concepts and techniques in the production of strategy and development of information systems.

B. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 15. Undertake analytical research, using appropriate research methodology, data collection and analysis into defined areas to produce evidence based meaningful and applicable recommendations for action to enhance information system development.
- ILO 16. Exercise self-direction, independent learning abilities and originality of thought in optimising, evaluating and presenting information system development recommendations and solutions.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Dedicated study skills sessions in the Foundations module.
- Access to materials on the Virtual Learning Environment (VLE) that support study skills development.
- Case studies that translate the theories into practical solutions.
- Lectures from subject matter experts both internal and external to the University.
- Visits to relevant organisations.
- Group-work involving investigation into a current subject area and presentation to peers.
- Physical and electronic access to resources provided by the University Library services.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Foundations of IS	10
ELECTIVE MODULES:	
5 modules chosen from modules 2-12	50
TOTAL:	60

³ Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

⁴ Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
ELECTIVE MODULES:	
N/A	
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1–12	120
Module 13 (Thesis)	80
ELECTIVE MODULES:	
N/A	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

⁵ Providing the minimum mark is met, a mark of 40–49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time

Full-time students register for the course in September and are expected to complete the course within 48 weeks. Full-time modules run in three week blocks with a week of directed study prior to a taught week and another directed study period after the taught week to allow time for more independent learning, reflection and completion of coursework. Two modules are run via the VLE over a period of approximately 14 weeks.

Part-Time

Part-time students have up to five years to complete the 12 modules and dissertation (on average four modules per year) but could complete in less than three years depending on student availability to study. Modules are taken with the full time students during the full-time delivery and via the virtual learning environment (VLE). Part time students typically complete each module over a seven week period (sharing the same taught week with the full-time students but with six weeks of directed study, made up of three weeks of directed study before the taught week and three weeks after the taught week to allow time for more independent learning, reflection and completion of coursework).

7. Course Level Assessment Strategy⁴

The varied assessment tasks are challenging and enable students to demonstrate a full range of skills and attributes. The pre-requisite module, Foundations of Information Systems, will introduce students to masters level study, research techniques and academic writing and will be assessed through an essay. Assessments will be of varying lengths, recognising that writing articles to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length and type of each assessment task is clearly stated within the module descriptor. Students will produce employability relevant policy briefing documents, reports, posters, and presentations to equip them with the skills they require to succeed in Information Capability Management and to address the specific award ILOs [1-14]. Students have opportunities to develop their communication skills, as they are required to presentations. The ability to work effectively in groups is a highly desirable skill which has translated into ILOs [9 and 11]. Feedback is given immediately after the group presentation. Modules are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative

50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

⁶ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

feedback is given verbally/written within the classroom/on the Virtual Learning Environment (VLE) following discussions from the module leader and oral feedback provided by the tutor and peers for presentations. Students are generally encouraged to support each other by asking and answering questions via the VLE. The taught components precede the dissertation, so assessment can be used to develop skills required for the individual research project. This is further supported by a dissertation workshop. Students are generally expected to be more self-directed in their learning during this research project, and guidance will be provided through materials on the VLE and their supervisor. The research project specifically addresses ILOs 15 and 16 and takes the form of a Thesis.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
											Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date		Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	R-SISD-F	Foundations of IS	Antoinette Caird-Daley	30		10	N	05/09/22	05/09/22	09/09/22	40	ICW	100				19/09/22 FT 03/10/22 PT (A)	AY 22/23 AY 22/23

+ Distance learning module

⁷ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁸ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁹ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

¹⁰ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

¹¹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹² Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹³ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
								09/01/23	09/01/23	13/01/23							06/02/23 PT(B)	AY 23/24
2	R-SISD-PI	Professional Issues	Truth Lumor	10		10	N	05/09/22	05/09/22	06/01/23 end of online module	40	ICW	100				09/01/23 FT/PT	AY 23/24
6	R-SISD-MT	Methods and Tools for Information Systems Development	Ian Owens	30		10	Y	05/09/22 PT 19/09/22 FT	26/09/22	30/09/22	40 --- 40	GPR ES ----- ICW	25 ----- 75				30/09/22 FT/PT ----- ----- 10/10/22 FT 24/10/22 PT	AY 23/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
4	R-SISD-STOV	Systems Thinking for Organisational Viability	Jeremy Hilton	35		10	Y	12/09/22 PT	03/10/22	07/10/22	40	ICW	100				31/10/22 PT (A)	AY 22/23 AY 23/24
								06/03/23 PT 20/03/23 FT	27/03/23	31/03/23							10/04/23 FT (B) 24/04/23 PT (B)	
3	R-SISD-PM	Programme and Project Management for Information Systems	Simon Renfrey	30		10	Y	26/09/22 PT 10/10/22 FT	17/10/22	21/10/22	40	ICW	100				14/11/22 PT 31/10/22 FT	AY 23/24
5	R-SISD-SE	Software Engineering	Pathmeswaran Raju	30		10	Y	17/10/22 PT	07/11/22	11/11/22	40 40	GCW ICW	25 75				11/11/22 FT/PT	AY 23/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
								31/10/22 FT									21/11/22 FT 05/12/22 PT	
7	R-SISD-ISA	Systems Architecture	Rick Adcock	30		10	N	07/11/22 PT 21/11/22 FT	28/11/22	02/12/22	40 ----- 40	ICW ----- GCW	75 ----- 25				12/12/22 FT 09/01/23 PT ----- 02/12/22 FT/P T	AY 23/24
8	R-SISD-ETM	Emerging Technology Monitoring	Ian Owens	7		10	Y	09/01/23	09/01/23	12/05/23 end of	40	ICW	100				15/05/23 FT/PT	AY 23/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
										online module								
9	R-SISD-DMSM	Data Modelling, Storage and Management	Pathmeswaran Raju	30		10	N	03/01/23 PT 16/01/23 FT	23/01/23	27/01/23	40 ----- 40	GCW ----- ICW	25 ----- 75				27/01/23 FT/PT ----- 06/02/23 FT 20/02/23 PT	AY 23/24
10	R-SISD-DLDS	Data-led Decision Support and Artificial Intelligence	Adam Zagorecki	30		10	Y	23/01/23 PT 06/02/23 FT	13/02/23	17/02/23	40	ICW	100				27/02/23 FT 13/03/23 PT	AY 23/24
11	R-SISD-IAS	Cyber Security and Information	Danny Steed	30		10	N	13/02/23 PT	06/03/23	10/03/23	40 -----	GCW -----	25 -----				10/03/23 FT/PT	AY 23/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
		Assurance						27/02/23 FT			40	ICW	75				20/03/23 FT 03/04/23 PT	
12	R-SISD-SAIS	Digital Business Strategy	Truth Lumor	30		10	N	03/04/23 PT 17/04/23 FT	24/04/23	28/04/23	40	GCW ----- ICW	25 ----- 75				28/04/23 FT/PT ----- ----- 08/05/23 FT 22/05/23 PT	AY 22/23
13	R-ICM-THESIS	Thesis ¹²	Victoria Smy	48		80	N	Workshop:	12/12/22	14/12/22	50	Thesis	100					

¹² Occurrence A is for Full time students. Occurrences B & C are for Part-time students who have completed the taught phase of the Course; Occurrence chosen is to be agreed in consultation with Course Director

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module Code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
								A 08/05/23	A 08/05/23	19/06/23 21/02/23							A 28/07/23 FT	
								B 30/09/22	B 30/09/23	A 28/07/23							B 30/09/23 PT	
								C 31/03/23	C 31/03/23	B 30/09/23 C 29/03/24							C 29/03/24 PT	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-SISD-DLDS	Data Led Decision Support & Artificial Intelligence	Information Capability Management	Defence Cyber Masters Programme Defence and Security Programme
R-SISD-ETM	Emerging Technology Monitoring	Information Capability Management	Defence Cyber Masters Programme Defence and Security Programme
R-SISD-PM	Programme and Project Management for Information Systems	Information Capability Management	Defence and Security Programme
R-SISD-SE	Software Engineering	Information Capability Management	Defence and Security Programme
R-SISD-MT	Methods and Tools for Information Systems Development	Information Capability Management	Defence and Security Programme
R-SISD-STOV	Systems Thinking for Organisational Viability	Information Capability Management	Defence Cyber Masters Programme Defence and Security Programme

8. How are the ILOs assessed?

The Course uses a range of assessment types. Depending on the number and type of modules taken students can expect assessment by submitted work and elements of assessment by presentation. Some of this assessed work will be completed in groups. For each module students will be invited to undertake one or more pieces of coursework which collectively will form a portfolio of work to be assessed.

This approach has been adopted in order to present students with a variety of realistic problems that need to be solved using a variety of approaches which provide opportunities to demonstrate their ability to apply skills and knowledge developed on the course, many of which relate to situations that might be found in the workplace. To obtain an MSc, students must complete a thesis, demonstrating their ability to apply the skills and knowledge gained on the course to a real world problem.

Assessment and ILO Mapping

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A. Postgraduate Certificate/Diploma

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14	ILO15	ILO16
R-SISD-F	ICW							ICW								
R-SISD-PI	ICW				ICW									ICW		
R-SISD-PM		ICW	ICW		ICW		ICW		ICW		ICW					ICW
R-SISD-MT	ICW GPRES	ICW GPRES			ICW GPRES			ICW GPRES	ICW GPRES		ICW GPRES		ICW GPRES	ICW GPRES	ICW GPRES	ICW GPRES
R-SIDS-SE		GCW/ ICW			GCW	GCW/ ICW	ICW		GCW		ICW					
R-SIDS-ISA	ICW	ICW GCW			ICW, GCW	ICW, GCW		ICW	GCW	ICW	GCW	ICW	GCW	GCW	ICW	ICW
R-SISD-SAIS	GCW	ICW				ICW/ GCW		ICW/ GCW	GCW	GCW	GCW	GCW	ICW	GCW		
R-SISD-ETM				ICW				ICW								
R-SISD-STOV		ICW							ICW		ICW				ICW	
R-SISD-IAS								ICW	GCW			ICW				
R-SISD-DMSM					ICW, GCW		ICW	ICW, GCW	GCW	ICW, GCW	GCW	ICW, GCW			ICW	ICW
R-DISD-DLDS								ICW					ICW	ICW		

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO15	ILO16
R-ICM- THESIS	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

On successful completion of the course the student will have a Masters' Degree in Information Capability Management accredited by two professional bodies, recognised by Government and industry, representing Information Professionals (CILIP) and IT Professionals (BCS). The course will take students on to further senior management career opportunities with skills in appropriate areas including business strategy development and implementation, information management, information assurance/ cyber security, development of appropriate business systems and strategic application of information systems.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: April 2021 / July 2022

1. What is the course?

Course information

Course Title	MSc in Investment Management
Course code	MSIVMFTC, PDIVMFTC, PCIVMFTC
Academic Year	2022/23
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Finance and Economics
Course Director	Dr Nemanja Radić
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc – one year
Course Start Month(s)	September

Institutions delivering the course

This course will primarily be delivered by Finance and Accounting group in School of Management. The course has 90 credits on the core modules and 30 credits of specialism being completed through 3 electives.

Cranfield University interacts with the following institutions and in the following ways:

- Teaching/instruction from external academic, industry and other guest speakers
- Individual thesis

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The Chartered Financial Analyst (CFA) Institute University Affiliation Program provides an approved route to work towards an additional professional qualification.

2. What are the aims of the course?

Cranfield University offers this course in order to provide students with an advanced-level conceptual foundation in various functional dimensions of the complex world of investment management. It will impart better understanding of investment issues and develop the necessary skills and knowledge in line with the requirements of the investment industry within the UK and worldwide.

The objectives are six-fold:

1. To prepare students for the world of employment in investment management through a high-quality teaching of specialised modules that will focus on developing a strong understanding of theory and its application in practice.
2. To provide a rich student learning experience through hands on teaching techniques that will utilise the application of data analysis using Bloomberg and other sources.
3. To enrich student learning experience by offering an opportunity to do independent research projects.
4. To impart advance study and understanding of the investment sector and the changing external context in which it operates.
5. To develop a range of finance knowledge and skills, together with self-awareness and personal development appropriate for successful career in the investment industry.
6. To enhance lifelong learning through the development of transferable intellectual and study skills to enable self-direction and creativity, in order to contribute to business, the economy and society at large.

The proposed programme will be equally attractive to new graduates and those looking to develop a career in the investment industry such as investment specialists, traders, fund managers, risk managers, analysts and brokers.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Appraise key investment and management issues.
- ILO 2. Interpret and apply accounting and financial information effectively.
- ILO 3. Demonstrate originality in the application of firm valuation and financial modelling for practical decision making.
- ILO 4. Apply key investment management skills required for decision making.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Critically assess current research in finance and investment together with the capacity to evaluate its relevance to practice.
- ILO 6. Use their conceptual understanding to evaluate contemporary issues and methods for financial analysis and, where appropriate, adapt them in the context of both advanced scholarship and their selected specialisms.
- ILO 7. Acquire and use information effectively in any appropriate medium, including the increasing range of analytical tools for investment decision making.
- ILO 8. Advance their knowledge and develop new financial and management skills to a high level.
- ILO 9. Apply investment management theories, tools and techniques in a variety of contexts including case studies, trading simulations and the individual thesis project.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 10. Evaluate appropriate theoretical frameworks for an issue or situation under consideration and to apply the technique(s) correctly.
- ILO 11. Display practical capabilities in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 12. Carry out research using appropriate techniques and draw justifiable inferences from the data obtained.
- ILO 13. Critically evaluate and synthesis the published literature in finance and investment.
- ILO 14. Produce a high-quality thesis and critically evaluate the interpretations of the data.

4. How is the course taught?

Overall, the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course will be supported by an electronic learning environment (VLE - Canvas) which will be the central repository for all information relating to the course and available to the students at all times. This will be supplemented by online module case packs. Additional practical expertise will be provided by visiting fellows and guest speakers. Each core module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving 100 notional learning hours per module. Each elective module has 100 notional hours consisting of 20 class contact hours and a further 80 private study hours. The thesis component of the module is a total of 80 credits.

The teaching methods, as laid out in section 2, include:

- Lectures
- Student centred learning/reflection
- Exercises/Case studies
- Trading Simulations
- Thesis supported by academic supervision

In addition to the teaching methods outlined above, students are supported in their learning and personal development by:

- Personal development lectures delivered by the head of the careers development service
- Help with preparation of CVs
- Help through mock interviews

The MSc in Investment Management will be differentiated from our existing Finance and Management MSc by:

- By targeting students with strong quantitative skills looking for careers in investment industry
- By offering a number of new and unique electives with a global perspective
- By making suitable changes to the existing Finance and Management programme contents and making it more corporate finance-oriented MSc
- By orientating career development towards investment industry

Students will be supported in their learning and personal development by:

- Two-week orientation program in accounting, finance and statistics aimed at students with quantitative background but have little or no prior background in accounting and finance and statistics
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions
- Organisation Behaviour and Personal Development module
- A Virtual Learning Environment
- Learning teams supported by an academic tutor

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	60
Any 6 core modules from 1-5, and 8-11. and/or	
ELECTIVE MODULES:	n.a.
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
All modules 1-5, and 8-11	90
ELECTIVE MODULES:	
3 modules from 6-7, and 12-16	30
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
All modules 1-5, and 8-11	90
17 Thesis	80
ELECTIVE MODULES:	
3 modules from 6-7, and 12-16	30
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis**, a mark of ≥50% in order to receive a pass (where it exists).

6. **How is the course structured?**

The course will be offered on a full-time base only. Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

The core modules will be taught in a series of 10x2 hour lectures in the first two terms. The elective modules will be taught in a series of 10x2 hour lectures across term 1 (1 out of 2) and term 2 (2 out of 5). The individual research-based thesis is undertaken during terms 3 and 4.

7. **Course Level Assessment Strategy**⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience.

The assessment strategy of this course is challenging and diverse and enable students to demonstrate a full range of skills and attributes.

Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams.

This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days of submission deadline.

Many modules (and especially electives) are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through the [*Applied Research Methods in Finance* module] and meetings with their thesis supervisor.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules

Investment Management (Cranfield)

Module occ A

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
0		M-T-IND	SOM MSc Induction Week	Nemanja Radic	0			Y		26/09/22	30/09/22		AO							
1		M-F/COF	Corporate Finance	Prof. Yacine Belghitar	20		10	Y	26/09/22	05/10/22	03/11/22	40	EX	100					w/c 12/12/22	w/c 19/06/23

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
2		M-F/SAF	Statistical Analysis in Finance	Dr Nemanja Radić	20		10	Y	26/09/22	03/10/22	15/11/22	40	EX	100				w/c 12/12/22	w/c 19/06/23
3		M-F/ACC	Accounting	Dr Matthias Nnadi	20		10	Y	26/09/22	04/10/22	01/12/22	40	EX	100				w/c 12/12/22	w/c 19/06/23
4		M-F/ECO	Economics for Financial Markets	Prof. Constantinos Alexiou	20		10	Y	26/09/22	04/10/22	04/11/22	40	EX	100				w/c 12/12/22	w/c 19/06/23
5		M-F/FMRE	Financial Markets, Regulation and Ethics	Dr Walter Gontarek	20	20	10	Y	26/09/22	05/10/22	08/11/22	40	GCW	100				06/12/22	TBC
6		M-F/ORG	Organisational Management	Lyn Lanka	20		10	Y	26/09/22	07/11/22	01/12/22	40	ICW	100				09/01/23	TBC
7		M-F/IES	Investing for Environmental and Social Impact	Dr Nemanja Radić Dr Walter Gontarek	20	20	10	Y	26/09/22	10/11/22	02/12/22	40	GPRES	100				09/01/23	TBC
8		M-F/VFM	Valuation and Financial Modelling	Dr Vineet Agarwal	20		10	Y	09/01/23	09/01/23	20/02/23	40	EX	100				w/c 24/04/23	w/c 26/06/23
9		M-F/ARMF	Applied Research Methods in Finance	Dr Vineet Agarwal	20		10	Y	09/01/23	18/01/23	02/03/23	40	GCW	100				30/03/23	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
10		M-I/IPM	Investment and Portfolio Management	Prof. Sunil Poshakwale/ Dr Peter Yallup	20		10	N	09/01/23	11/01/23	13/02/23	40	EX	100				w/c 24/04/23	w/c 26/06/23
11		M-I/DFRM	Derivatives and Financial Risk Management	Dr Peter Yallup	20	20	10	N	09/01/23	10/01/23	13/02/23	40	EX	100				w/c 24/04/23	w/c 26/06/23
12		M-F/PEQ	Private Equity	Dr Wasim Ahmad	20		10	Y	09/01/23	15/02/23	23/03/23	40	ICW	100				20/04/23	TBC
13		M-F/MAR	Mergers, Acquisitions and Restructuring	Prof. Yacine Belghitar Dr Andrea Moro	20		10	Y	09/01/23	14/02/23	12/04/23	40	GPRES	100				10/05/23	TBC
14		M-F/FIS	Fixed Interest Securities and Credit Risk Modelling	Dr Vineet Agarwal	20		10	Y	09/01/23	27/02/23	23/03/23	40	ICW	100				20/04/23	TBC
15		M-F/FSS	FinTech, Start-Ups and Small Business Finance	Dr Andrea Moro	20		10	Y	09/01/23	21/02/23	11/04/23	40	GPRES	100				09/05/23	TBC
16		M-F/IEM	Investing in Emerging Markets and Alternative Investments	Prof. Sunil Poshakwale	20		10	Y	09/01/23	20/02/23	16/03/23	40	ICW	100				13/04/23	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
	Module Start Date (eg Pre-course task)								Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date		
17		M-F/THS	Thesis	Dr Nemanja Radić	50		80	Y	09/01/23	June 23 (TBC)	12/09/23	50	THESIS	100				12/09/23	TBC	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Module Type</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-F/COF	Corporate Finance	Compulsory	Finance and Management	Investment Management
M-F/SAF	Statistical Analysis in Finance	Compulsory	Finance and Management	Investment Management
M-F/ACC	Accounting	Compulsory	Finance and Management	Investment Management
M-F/ECO	Economics for Financial Markets	Compulsory	Finance and Management	Investment Management
M-F/FMRE	Financial Markets, Regulation and Ethics	Compulsory	Finance and Management	Investment Management
M-F/ORG	Organisational Management	Elective	Finance and Management	Investment Management
M-F/IES	Investing for Environmental and Social Impact	Elective	Finance and Management	Investment Management
M-F/VFM	Valuation and Financial Modelling	Compulsory	Finance and Management	Investment Management
M-F/ARMF	Applied Research Methods in Finance	Compulsory	Finance and Management	Investment Management
M-F/ICF	International Corporate Finance	Compulsory	Finance and Management	
M-F/STR	Strategic Management	Compulsory	Finance and Management	
M-I/IPM	Investment and Portfolio Management	Compulsory	Investment Management	
M-I/DFRM	Derivatives and Financial Risk Management	Compulsory	Investment Management	
M-F/PEQ	Private Equity	Elective	Finance and Management	Investment Management
M-F/MAR	Mergers, Acquisitions and Restructuring	Elective	Finance and Management	Investment Management
M-F/FIS	Fixed Interest Securities and Credit Risk Modelling	Elective	Finance and Management	Investment Management
M-F/FSS	FinTech, StartUps and Small Business Finance	Elective	Finance and Management	Investment Management
M-F/IEM	Investing in Emerging Markets and Alternative Investments	Elective	Finance and Management	Investment Management
M-F/THS	Thesis		Finance and Management	Investment Management

8. **How are the ILOs assessed?**

The course uses a range of assessment types: exams, group and individual assignments and an 80-credit thesis at the end of the programme.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs														
Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14
	Postgraduate Certificate				Postgraduate Diploma					MSc				
1	✓	✓	✓	✓										
2		✓	✓	✓										
3		✓		✓										
4	✓			✓										
5	✓			✓										
6	✓			✓										
7	✓			✓	✓			✓						
8	✓	✓	✓	✓		✓	✓	✓						
9	✓	✓		✓										
10	✓	✓		✓										
11	✓	✓		✓										
12					✓	✓		✓						
13					✓	✓	✓	✓						
14						✓	✓	✓						
15				✓	✓	✓	✓	✓						
16					✓		✓	✓						
17									✓	✓	✓	✓	✓	✓

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5-year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Investment management is one of the fastest growing industries and the potential for recruitment is very promising. The rapid growth and developmental needs of investment expertise, especially in emerging countries, will demand people with necessary knowledge and skills. Therefore, our graduates can expect to work in top investment banks, hedge funds, major consulting firms and other financial and banking sectors around the world.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: August 2020/April 2022

1. What is the course?

Course information

Course Title	MSc in Logistics and Supply Chain Management
Course code	MSLOSFTC, PDLOSFTC, PCLOSFTC
Academic Year	2022/23
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time (Cranfield only),
Location(s)¹ of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Centre for Logistics, Procurement and Supply Chain Management
Course Director	Hendrik Reefke
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	n/a
Is the Degree apprenticeship integrated or non-integrated?	n/a
Is the Mastership offered as an open and/or closed course?	n/a
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FEHQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year (Cranfield),
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the School of Management/ Centre for Logistics, Procurement and Supply chain Management, where the research interests include:

Procurement, logistics, supply chain management and marketing.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by The Chartered Institute of Logistics & Transport (CILT) and the European Logistics Association (ELA) until 2022.

2. What are the aims of the course?

Cranfield University offers this course in order to fulfil a market demand for highly capable graduates in the field of Logistics and Supply Chain Management. This is addressed through the aims of the course which are to provide students with:

- An overall appreciation of logistics and supply chain management and their importance to modern business.
- Appropriate technical knowledge in the key areas of logistics and supply chain management.
- Analytical, managerial and critical thinking skills that will enable them to apply this knowledge within a business environment.
- A critical understanding of the need to manage and plan supply chains within an overall business environment in an integrated and co-ordinated manner.
- Development in their ability to manage in complex and uncertain situations by focusing on soft skills such as communication, team-working and negotiation.
- Development in their ability to analyse, synthesise and critically evaluate information to take more effective management decisions.
- An understanding of the ethical and environmental implications of logistics and supply chain management decisions.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Possess a systematic understanding of logistics and supply chain knowledge, and a critical awareness of current supply chain problems and new thinking at the forefront of the discipline.

- ILO 2. Be able to identify appropriate techniques to address specific challenges in supply chain management.
- ILO 3. Analyse and solve supply chain problems systematically.
- ILO 4. Make reasoned judgements in the absence of complete data.
- ILO 5. Critically evaluate the application of current logistics and supply chain management research and evaluate its relevance to organisational practice.
- ILO 6. Communicate their conclusions clearly to specialist and non-specialist audiences.
- ILO 7. Demonstrate transferrable skills, including; time management, general communication, reflection, report writing and presentational and team working.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Be able to be original in the application of knowledge, together with a practical understanding of the analytical and managerial skills that will enable them to apply this knowledge within an overall business environment in a logical and coherent manner.
- ILO 9. Be able to analyse and solve complex logistics and supply chain problems systematically and creatively.
- ILO 10. Demonstrate self-direction and originality in solving supply chain problems and to act professionally in planning and implementing tasks and projects.
- ILO 11. Demonstrate additional transferrable skills, including; consultancy, project management, negotiation, cultural awareness and leadership.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 12. Independently and confidently be able to apply logistics and supply management theories, tools and techniques to a variety of situations.
- ILO 13. Demonstrate the ability to adapt appropriate logistics and supply management frameworks and contextualise for a specific organisational issue accurately.
- ILO 14. Display practical ability in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 15. Judge appropriate research methodologies for conducting research, and draw justifiable inferences from the data and analysis generated.
- ILO 16. Critically evaluate and synthesise the published literature.
- ILO 17. Undertake independent study on a relevant logistics and supply management subject, demonstrating the ability to plan, manage and execute an industrial (private or public sectors) or research-based project with specified time scales.
- ILO 18. Produce a high-quality thesis and critically evaluate the interpretations of the data.

4. How is the course taught?

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The teaching methods are:

- Lectures
- Student centred learning/reflection
- Case studies
- Video and audio materials
- Simulation
- Tutorials
- Problem based learning projects
- Individual research project with academic supervisors

In addition to these methods the programme offers:

- Induction Programme
- Learning teams supported by an academic tutor
- Extensive use of Virtual Learning Environment (VLE) as a means of delivering material to support and augment classroom learning
- Extensive use of the VLE as a means of delivering material to support and augment classroom learning
- Library induction, referencing and plagiarism sessions

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1	10
50 credits from the taught modules (2-10)	50
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 to 10	100
ELECTIVE MODULES:	
4 Modules from 11 to 25	20
TOTAL:	120

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 to 10	100
Module 26	0
Thesis	80

ELECTIVE MODULES:	
4 Modules from 11 to 25	20
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course in September in the following year.

The course is structured around four eleven week terms. In the first from September to December the students are given a thorough grounding in procurement and supply chain management through a series of six compulsory core elements, including the participation in a supply chain game, which integrates students' learning from the course and develops their team working skills.

In the second term from January to March, students study the remaining four compulsory 10 credit modules, two procurement 5 credit modules and two 5 credit options. The electives allow the students to

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

start to specialise and to tailor their learning to their own interests within procurement and supply chain management.

The third and fourth terms are effectively merged and during this period the students undertake an individual thesis project. It is expected that the majority of students will undertake this thesis project within an organisation, which can be in the profit or not for profit sector. Alternatively, students can undertake a Cranfield led research-based thesis project.

7. Course Level Assessment Strategy⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience.

The assessment strategy of this course is challenging and diverse and enable students to demonstrate a full range of skills and attributes.

Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams.

This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days.

Many modules *SCSS, PSP, IOM, NCM, PMI, WHS, BMG, SXS, SOP, CSC* are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session

Formative feedback

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through the *Evidence-Based Management* module and meetings with their thesis supervisor.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Logistics and Supply Chain Management (Cranfield)

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment									
											Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
															Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0		M-T-IND	SOM MSc Induction Week				0			26/09/2022	30/09/2022		AO								
1		M-L/SCSS	Supply Chain Strategy and Sustainability	Dr Heather Skipworth	20		10	Y	04/10/22	04/10/22	21/10/22	40	ICW	100					11/11/2022		

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Minimum Mark ⁷ - 40% or 50%	Assessment						
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date		Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
2		M-L/PSP	Principles of Strategic Procurement	Dr Farooq Habib	20		10	Y	01/11/22	01/11/22	07/12/22	40	ICW	100				12/01/2023	
3		M-L/AFSC	Accounting and Finance for Supply Chain Management	Dr Simon Templar	20		10	Y	26/10/22	26/10/22	08/12/22	40	EX	100				TBC W/c 12/12/2022	
4		M-L/ATS	Analytical Techniques for Supply Chain Management	Prof Emel Aktas	20		10	Y	03/10/22	03/10/22	24/11/22	40	ICW	100				13/12/2022	
5		M-L/FRT	Freight Transport	Prof Melvyn Peters	20		10	Y	31/10/22	31/10/22	09/12/22	40	ICW	100				06/01/2023	
6		M-L/IOM	Inventory and Operations Management	Dr Anurag Tewari	20		10	Y	03/10/22	03/10/22	11/11/22	40	GCW	100				02/12/2022	
7		M-L/ISB	Information Systems and e-Business	Dr Abhijeet Ghadge	20		10	Y	03/10/22	03/10/22	02/11/22	40	GCW	100				21/11/2022	
8		M-L/PMI	Project Management Introduction	Chantal Cantarelli	20		10	Y	Occ-A 20/02/23	20/02/23	24/02/23	40	GCW	100				17/03/2023	
9		M-L/PND	Physical Network Design	Dr Nicky Yates	20		10	N	09/01/23	09/01/23	13/02/23	40	ICW	100				14/03/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Minimum Mark ⁷ - 40% or 50%	Assessment						
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date		Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
10		M-L/WHs	Warehousing	Dr Hendrik Reefke	20		10	N	16/01/2023	16/01/23	09/02/23	40	ICW	100				03/03/2023	
11		M-P/BPO	Business Process Outsourcing	TBC	12		5	Y	10/01/23	10/01/23	13/01/23	40	GCW	100				03/02/2023	
12		M-P/RSC	Designing and Managing Resilient Supply Chains	Dr Uta Jüttner	12		5	Y	31/01/23	31/01/23	03/02/23	40	GCW	100				24/02/2023	
13		M-L/OUT	Logistics Outsourcing	Prof Melvyn Peters	12		5	Y	09/01/23	09/01/23	11/01/23	40	ICW	100				01/02/2023	
14		M-L/PRR	Planning and Resourcing Road Freight Transport	Prof Melvyn Peters	12		5	Y	20/02/23	20/02/23	22/02/23	40	GCW	100				22/03/2023	
15		M-L/HLR	Humanitarian Logistics	Dr Hendrik Reefke	12		5	Y	16/03/23	16/03/23	17/03/23	40	ICW	100				24/04/2023	
16		M-L/SIM	Simulation	Dr Nicky Yates	12		5	Y	20/03/23	20/03/23	22/03/23	40	ICW	100				27/04/2023	
17		M-L/SXS	Six Sigma	Dr Farooq Habib	12		5	Y	13/03/23	13/03/23	14/03/23	40	GCW	100				19/04/2023	
18		M-L/PFM	Performance Measurement in	Rick Forster	12		5	Y	08/03/23	08/03/23	10/03/23	40	GCW	100				17/04/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			the Supply Chain																
19		M-L/SOP	Sales and Operations Planning	Dr Heather Skipworth	12		5	Y	23/03/23	23/03/23	24/03/23	40	ICW	100				03/05/2023	
20		M-L/RLO	Retail Logistics	Prof Aristides Matopoulos	12		5	Y	02/03/23	02/03/23	03/03/23	40	ICW	100				17/04/2023	
21		M-L/SNCC	Social Network Analysis in a Supply Chain Context	TBC	12		5	Y	Not running AY 22-23	N/A	N/A	40	ICW	100				N/A	
22		M-L/BMG	Business Model Generation	TBC	12		5	Y	Not running AY 22-23	N/A	N/A	40	GCW	100				N/A	
23		M-P/FDP	Future of Digital Procurement	Dr Farooq Habib	12		5	Y	06/03/23	06/03/23	07/03/23	40	GCW	100				12/04/2023	
24		M-L/BDA	Big Data Analytics for Supply Chain Management	Dr Abhijeet Ghadge	12		5	Y	28/02/23	28/02/23	15/03/23	40	ICW	100				17/03/2023	
25		M-L/CSC	Circular Supply Chains	Hendrik Reefke	12		5	Y	06/02/23	06/02/23	13/02/23	40	GCW	100				06/03/2023	
26		M-L/RSM	Research Methods	Hendrik Reefke	12		0	Y	17/04/23	17/04/23	03/05/23	N/A	AO	N/A				N/A	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
											Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates			
	Module Start Date (eg Pre-course task)								Module Delivery Start Date	Module Delivery End Date		Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date		
27		M-L/THS	Thesis	Hendrik Reefke	0		80	Y	17/04/23	17/04/23	01/09/23	50	THESIS	100					01/09/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/SCSS	Supply Chain Strategy and Sustainability	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/PSP	Principles of Strategic Procurement	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/AFSC	Accounting and Finance for Supply Chain Management	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Management; Management and Corporate Sustainability; Management and Entrepreneurship; Exec LSCM
M-L/ATS	Analytical Techniques for Supply Chain Management	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/FRT	Freight Transport	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/IOM	Inventory and Operations Management	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/ISB	Information Systems and e-Business	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM
M-L/PMI	Project Management Introduction	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Exec LSCM, Design Strategy and Leadership, Digital Design and Strategic Communication, Innovation and Creativity in Industry
M-L/PND	Physical Network Design	Logistics and Supply Chain Management	Exec LSCM
M-L/WHs	Warehousing	Logistics and Supply Chain Management	Exec LSCM
M-P/BPO	Business Process Outsourcing	Procurement and Supply Chain Management	Logistics and Supply Chain Management
M-P/RSC	Designing and Managing Resilient Supply Chains	Procurement and Supply Chain Management	Logistics and Supply Chain Management
M-L/OUT	Logistics Outsourcing	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/PRR	Planning and Resourcing Road Freight Transport	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/HLR	Humanitarian Logistics	Logistics and Supply Chain Management	Procurement and Supply Chain Management

M-L/SIM	Simulation	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/SXS	Six Sigma	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/PFM	Performance Measurement in the Supply Chain	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/SOP	Sales and Operations Planning	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/RLO	Retail Logistics	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/SNCC	Social Network Analysis in a Supply Chain Context	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/BMG	Business Model Generation	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-P/FDP	Future of Digital Procurement	Procurement and Supply Chain Management	Logistics and Supply Chain Management
M-L/BDA	Big Data Analytics for Supply Chain Management	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/CSC	Circular Supply Chains	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/RSM	Research Methods	Logistics and Supply Chain Management	Procurement and Supply Chain Management
M-L/THS	Thesis	Logistics and Supply Chain Management	Procurement and Supply Chain Management

8. How are the ILOs assessed?

The course uses a range of assessment types including both individual and group coursework, exams and a thesis.

This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs																		
	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14	ILO15	ILO16	ILO17	ILO18

Module No.																			
	PG Certificate in Supply Chain Management							PG Diploma in Logistics and Supply Chain Management				MSc in Logistics and Supply Chain Management							
1	✓		✓	✓	✓	✓	✓			✓	✓		✓						
2	✓	✓	✓		✓	✓	✓				✓		✓						
3					✓				✓										
4	✓	✓	✓	✓	✓		✓	✓	✓				✓						
5	✓		✓		✓	✓													
6	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓						
7		✓			✓						✓								
8		✓		✓		✓	✓			✓	✓								
9	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓							
10	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓							
11	✓			✓		✓					✓	✓	✓						
12	✓	✓	✓	✓		✓		✓	✓		✓	✓							
13	✓	✓				✓					✓	✓							
14	✓	✓				✓	✓				✓	✓							
16	✓	✓				✓	✓				✓	✓							
17	✓	✓	✓	✓		✓	✓				✓	✓	✓						
18	✓					✓					✓	✓		✓					
19	✓	✓	✓	✓		✓					✓	✓							
20	✓	✓					✓	✓		✓	✓								
21	✓	✓	✓			✓	✓	✓		✓	✓								
22		✓				✓	✓	✓			✓								
23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓			
24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓				
25	✓	✓	✓	✓			✓	✓		✓	✓	✓							
26					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
27					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Graduates of the course are much sought after by employers. They include organisations from the 'not for profit' sector as well as a wide range of companies from the 'for profit' sector. Career progression for

many of the graduates is often very rapid and a number have become logistics or supply chain directors for major international organisations.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: March 2022

1. What is the course?

Course information

Course Title	Maintenance Engineering and Asset Management
Course code	MSMEAFTC, MSMEAPTC, (PDMEAFTC, PDMEAPTC, PCMEAFTC, PCMEAPTC exit routes only)
Academic Year	2022-23
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full Time, Part Time,
Location(s)¹ of Study	Cranfield
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Centre for Life-cycle Engineering and Management (CLEM)
Course Director	Dr Muhammad Khan
Awarding Body	Cranfield University
Is this an AP Contract course?²	n/a
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	No
Is the Degree apprenticeship integrated or non-integrated?	No
Is the Mastership offered as an open and/or closed course?	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University Entry Requirement
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	n/a
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years,
Course Start Month(s)	Full-time MSc: September, Part-time: September

Institutions delivering the course

This course is delivered by School of Aerospace, Transport and Manufacturing/Manufacturing/Centre for Life-cycle Engineering and Management (CLEM) where the research interests include:

- Reliability and Maintainability
- Failure Analysis and Condition Based Maintenance
- Asset Management
- Diagnostics and Prognostics
- Risk Assessment
- Digital Engineering Services

Centre for Life-cycle Engineering and Management (CLEM) is among the world leaders in through-life approaches for high-value systems, condition monitoring, damage tolerance and asset management. CLEM was developed with the aim to achieve research excellence and address the research problems in the sector of Through-life Engineering services. CLEM is providing its excellent academic teaching and research services to industrial clients such as Boeing, BAE Systems, Rolls-Royce, Meggitt, Thales, MOD, Bombardier, QinetiQ, Network Rail, Schlumberger and Alstom.

In the last decade, Cranfield's CLEM has built world-class critical mass, capability and reputation in the fields of maintenance engineering and asset management. The Institute currently has more than 20 full-time academic staff actively involved in maintenance related academic teaching and research. Most of them are active Fellows or Members of reputed professional organizations such as Institute of Asset Management, British Institute of Non-Destructive Testing, Institute of Mechanical Engineers and Institute of Engineering Technology. The CLEM has a proud history in successfully running an Executive Master's course in Through-life System Sustainment. The institute will be actively involved in offering the Apprenticeship in Through-life Engineering Services.

The unique feature of the proposed course (i.e., Maintenance Engineering and Asset Management) is its applied and practical nature, aimed at the availability of strategic assets. The laboratories in CLEM are fully equipped with the state of the art equipment and make it possible to provide a hands-on learning environment during the delivery of the proposed course.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Maintenance Engineering, Condition Monitoring, Asset Management, Reliability

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not currently accredited by any PSRB.

2. What are the aims of the course?

This course provides a deep understanding, skills and critical appraisal in maintenance engineering and asset management, so graduates can transform their industry culture in cost-effective maintenance. It

enables graduates to create strategic maintenance plans for technologies and management. The course taught content blends with hands-on exercises and covers maintenance from fundamentals to implementation.

This programme is intended for the following range of students:

This course is suitable for graduates with engineering or sciences or related degrees keen to pursue careers in industrial maintenance planning, control and management; graduates currently working in industry keen to extend their qualifications; or individuals with other qualifications who possess considerable relevant experience.]

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Assess the regular and sudden failures in machines and structures and determine their root cause.
- ILO 2. Evaluate the suitability of inspection techniques in the context of real operation failures.
- ILO 3. Analyse the potential risks in considered maintenance routines and recommend mitigation activities.
- ILO 4. Assess the impact of technical and financial management on asset availability.
- ILO 5. Evaluate and solve the technical complexities in implementing new methodologies and technologies to develop customized maintenance routines.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Critically analyze the existing academic and industrial practices in maintenance engineering or closely related disciplines.
- ILO 7. Propose ideas and methodologies to enhance and/or improve the current practices in maintenance engineering or closely related disciplines by means of a written communication or an oral presentation or both.
- ILO 8. Develop the required skills (such as time and team management, presenting technical topics and writing technical document) that ensure successful delivery and/or submission of your own reflections about the current practices in maintenance engineering or closely related disciplines while working individually or in a team.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 9. Formulate a solution to any given academic or industrial research problem in the form of a concisely written thesis project report.
- ILO 10. Deliver a synthesis of the project in the form of an oral examination with reference to a poster that illustrates the research.

4. How is the course taught?

Students will be supported in their learning and personal development by:

The Maintenance Engineering and Asset Management course will deliver the modules through conventional lectures, problem based learning and reflection based learning. One of the key objectives of the proposed course is to inculcate a set of hands-on maintenance skills in the students. These skills will provide a comprehensive understanding of failure mechanisms of real machinery setups and their suitable maintenance routines. Extensive hands-on training sessions will be setup on the existing CLEM research facilities and will be delivered as a part of the taught modules

In addition to the teaching methods outlined students will be supported in their learning and personal development by:

1. Comprehensive course materials (provided), as well as a website using the Virtual Learning Environment (VLE). Part-time students will be supported by distance-learning methods including telephone/conference calls and e-mail interactions for two of their modules: Individual Research Project and Dissertation of Part Time Students.
2. Students are guided through the use of study texts, and the use of interactive exercises. Problem-based/Reflection based learning will be included to promote self-centred learning. The TEL team will be involved in the preparation of some lecturing material.
3. Course directors and module leaders will be available to provide support and advice on an informal basis to student queries. The same support will be provided to part-time students via email and telephone communication

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Any 6 from modules 1 to 8 Module 0	60 0
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 to 8 Module 0 Group Project(FT) or Dissertation (PT)	80 0 40
TOTAL:	120

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 to 8	80
Module 0	0
Group Project (FT) or Dissertation (PT)	40
Individual Research Project (10)	80
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 11 calendar months.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

Part-time students register for the course in September and are expected to complete the course within 3 years.

The taught modules and group projects are delivered between October and April, thereafter the full-time students undertake an individual research project. Modules are taught over one week and a second week is provided which is largely free of structured teaching to allow time for more independent learning and reflection.

Part-time students will attend modules with full-time students. However, they can complete their course within 2 or 3 years. The number of modules which they need to select in a year will be dependent on their planned time to complete the course. Indicative timetables are provided here considering two and three years pathways for a part time student:

Part Time Student with two year plan of completion:

Year-1:

Taught Modules: Induction (Sept), Industrial Maintenance (Oct), Failure of Materials and Structures (Oct), Maintenance Planning and Control (Nov), Asset Management (Jan) and Dissertation (Feb - August)

Year-2:

Taught Modules: System availability and maintainability (Jan), Condition based maintenance (Nov), Diagnostics and Prognostics (Dec), Probability and Statistics in risk and Reliability Engineering (Oct), Individual Thesis Project (Feb - Sep)

Part Time Student with three year plan of completion:

Year-1:

Taught Modules: Induction (Sept), Industrial Maintenance (Oct), Condition based maintenance (Nov), Asset Management (Jan)

Year-2:

Taught Modules: System availability and maintainability (Jan), Maintenance Planning and Control (Nov), Probability and Statistics in risk and Reliability Engineering (Oct) and Dissertation (Feb - August)

Year-3:

Taught Modules: Failure of Materials and Structures (Nov), Diagnostics and Prognostics (Nov), Individual Thesis Project (Feb – Sep)

Part-time students can propose work-related research projects for their Dissertation and Individual thesis Project modules. They will be allowed to pursue the research under these modules at their work places while assessment will only be done at Cranfield campus.

7. Course Level Assessment Strategy⁴

MEAM course comprises 8 taught modules, a group project and an individual thesis. The overall course assessment strategy includes the assessment methods defined for each of the mentioned in their respective descriptors. These methods are summative and formative. The selection of these methods for a module depends on its ILO's. The course assessment will start with the delivery of its first module (i.e., Industrial maintenance) by a formative assessment during the brainstorming and the open discussion sessions. The module will end up in a summative assessment with a closed book written examination of 2 hours. The exam questions will evaluate student's understanding about the suitability and the significance of maintenance approaches in industrial scenarios. The student will receive feedback on this summative assessment within 20 working days of the exam date. Module Failure of Structures and Materials will use summative assessment (i.e., closed book examination) for evaluating student's comprehension about the material failures. The rest of the seven taught modules (i.e., Condition-Based Maintenance, Diagnostics and Prognostics, Maintenance Planning and Control, Industrial Maintenance, Asset Management, Probability and Statistics in Risk and Reliability Engineering and System Availability and Maintainability) will use individual assignment based summative assessments. These assignments will focus on real industrial case studies to judge student's ability in the selection of a feasible

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

maintenance approach with all related details such as planning, NDT techniques and asset maintainability optimization. The student will receive feedback on these assignments within 20 working days of the submission date. Similar to the first module, most of the mentioned taught modules will involve open discussion sessions that end up in formative feedback for the students. Five of the above modules will also include up to 30 hours of lab sessions. In these sessions, students will perform physical testing on assets and/or software-based tasks. Formative feedback will be provided after each of these lab sessions. After the taught module delivery and assessment (that covers the first 5 ILO's), students will then have opportunities to develop their communication skills, as they will be required to give a group presentation. The ability to work effectively in groups is a highly desirable skill, which mainly covers ILOs 6, 7 and 8. Feedback will be available immediately after the group presentation. In the last four months of the academic year, students will undertake an individual research project and that covers ILO's 9 and 10. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through the dedicated academic staff. The individual research project will mainly use summative mode of assessment where students have to submit a thesis report and a poster. The feedbacks on both submissions will be available for the students.

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
0	I-MAT-INWK	Introduction	Dr Sue Impey	39	0	0	Y	28/09/22	03/10/22	07/10/22	n/a	AO						N/A	N/A
1	I-MNU-A1008	Industrial Maintenance	Dr Muhammad Khan	27	0	10	N	10/10/22	10/10/22	14/10/22	50	ICW	100					07/11/22	TBC – if required
2	I-MNU-A1013	Probability and Statistics in Risk and Reliability Engineering	Dr Gustavo Castelluccio	30	0	10	N	17/10/22	17/10/22	21/10/22	50	ICW	100					14/11/22	TBC – if required

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. **10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education**

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. **Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.**

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	I-MAT-A1015	Failure of Materials and Structures	Dr Muhammad Khan	32	0	10	Y	31/10/22	31/10/22	04/11/22	50	EX	100				15/12/22	Manufacturing resit exams will be during week commencing: 15/05/23
4	I-MNU-A1010	Condition Based Maintenance	Dr Isidro Durazo Cardenas	32	0	10	N	21/11/22	21/11/22	25/11/22	50	ICW	100				04/01/23	TBC – if required
5	I-MNU-A1011	Maintenance Planning and Control	Dr Agusmian Ompusunggu	32		10	N	07/11/22	07/11/22	11/11/22	50	ICW	100				05/12/22	TBC – if required
6	I-IVH-A1514 (Occ C)	Diagnostics and Prognostics	Dr Muhammad Khan	25		10	Y	28/11/22	28/11/22	02/12/22	50	ICW	100				10/01/23	TBC – if required
7	I-MNU-A1012	Asset Management	Prof Andrew Starr	32		10	N	09/01/23	09/01/23	13/01/23	50	ICW	100				06/02/23	TBC – if required
8	I-MNU-A1009	System availability and Maintainability	Dr Suresh Perinpanayagam	30		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	TBC – if required
9a	I-MAT-GRPP	Group Project for Full-Time Students	Dr David Ayre	20		40	Y	30/01/23	30/01/23 Occ A FT	25/04/23 FT	50	GPRES GCW	16 64 10				25/04/23 02/05/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			Dr Supriyo Ganguly						06/02/23 Occ B PT	01/08/23 PT	50	ICW IPRAC	10				02/05/23 02/05/23	
												GPRES GCW ICW IPRAC	16 64 10 10				25/07/23 01/08/23 01/08/23 01/08/23	
9b	I-MAT-DISS	Dissertation for Part-time Students	Dr David Ayre/	20		40	Y	06/02/23	06/02/23	25/08/23	50	ICW ICW	90 10				25/08/23 25/08/23	
10	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y	06/02/23	cc A = PT 06/02/23	PT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	
								28/04/23	Occ B = FT 28/04/23	FT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAT-INWK	Induction	Advanced Materials	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Welding Engineering, Engineering and Management of Manufacturing Systems
I-MAT-A1015	Failure of Materials and Structures	Advanced Materials	Aerospace Materials, Aerospace Manufacturing
I-IVH-A1514	Diagnostics and Prognostics	Through life System Sustainment	
I-MAT-GRPP	Group Project for Full-Time Students	Advanced Materials	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing.
I-MAT-DISS	Dissertation	Advanced Materials,	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

			Development and Management, Management and Information Systems, Welding Engineering
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Advanced Materials, Aerospace Materials, Manufacturing Technology and Management, Welding Engineering, Metal Additive Manufacturing.

8. How are the ILOs assessed?

The following assessment types are utilised:

Students can expect to have either examinations or assessment by submitted work and elements of assessment by presentation or viva.

This approach has been adopted because:

It allows the students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRACT – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO4	ILO 5
1		ICW		ICW	ICW
2	ICW		ICW	ICW	
3	EX				EX
4	ICW	ICW			ICW
5			ICW	ICW	ICW
6	ICW	ICW			ICW
7			ICW	ICW	ICW
8			ICW	ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 6	ILO 7	ILO 8
9a	GPRES GRPROJ ICW IPRAC	GPRES GRPROJ ICW IPRAC	GPRES GRPROJ ICW IPRAC
9b	ICW	ICW	ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Award ILOs Module No.	ILO 9	ILO 10
10	THESIS IPRES	THESIS IPRES

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
None	None	N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

This qualification takes you on to a wide range of careers involving maintenance engineering and asset management, with responsibilities in industries including Oil and Gas, Aerospace, Defense, Power generation and distribution, Nuclear, Automotive, Chemical and Process, Manufacturing Textile, Civil

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Infrastructure, Logistics and Health. The unique feature of this course is its applied and practical nature, aimed at the availability of strategic assets. This course will qualify you to transform the current industry culture of OEM's based maintenance routines to strategy based maintenance.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: May 2022

1. What is the course?**Course information**

Course Title	MSc in Management
Course code	MSMGTFCTC, PDMGTFCTC, PCMGTFCTC
Academic Year	2022 - 2023
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Centre for Management
Course Director	Professor Michael Dickmann
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the School of Management (SOM), Leadership and Management Theme, Centre for Management across its four Communities where the research interests include:

a wide range of Management areas. The modules are either existing or combinations of modules already taught on existing MSc courses offered by SOM. Teaching is provided by SOM Faculty and selected lectures and case studies provided by Visiting Fellows/Professors. Company based thesis projects and internships will involve external organisations. However, Cranfield University School of Management remains fully responsible for the quality of delivery of the course and the assessment of the course. It also provides a core set of management modules which can be offered to the University and the opportunity to jointly develop MSc in Management plus programmes with other Schools.

Cranfield University interacts with the following outside institutions and in the following ways:

- Teaching/instruction from external academic, industry and other guest speakers.
- Individual thesis and particularly internship projects will be offered to and by various organisations (including not-for-profit and voluntary organisations).

To develop the above internship projects, we have outsourced the internship development function to a specialist internship company (e.g., Instant Impact Ltd) and to support this with an administrator to manage the relationship between the university and the students.

The course director has also developed a practice advisory board. Members have been drawn from recommendations made by module convenors and Directors of Community.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by The Chartered Management Institute (CMI.)

2. What are the aims of the course?

Cranfield University offers this course in order to add value to first degrees by developing in individuals a critical awareness of management and organisations, and assist them in taking effective roles within them at managerial career entry level.

The objectives are fivefold:

1. To prepare students for the world of employment in management, partly through a strong balanced focus between theoretical perspectives and simulation in the curriculum and partly through the thesis which is normally linked to the internship.
2. The advanced study of organisations, their management and the changing external context in which they operate.
3. Development of a range of business knowledge and skills, together with self-awareness and personal development appropriate for managerial career entry.
4. Development of the ability to apply concepts and theories to complex management issues, both systematically and creatively, to advance the effectiveness and competitiveness of the employing organisation.

5. Enhancement of lifelong learning through the development of transferable intellectual and study skills, personal development to enable self-direction and creativity, in order to contribute to business, the economy and society at large.

This programme is intended for the following range of students:

This is a pre-work experience programme intended for graduates from a non-business/ management subject looking to develop key managerial skills commensurate with managerial career entry opportunities. We also anticipate that some students who already have a higher educational degree in a technical area but lack managerial experience and would not meet the relevant work experience qualification for the MBA might also be interested in joining the MSc in Management (MiM) programme.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Diploma

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a systematic application and a critical awareness of current management research and to evaluate its relevance to industrial and commercial practice.
- ILO 2. Have a conceptual understanding that enables the student to evaluate critically current research and/or methodologies, develop critiques of them, and where appropriate adapt them.
- ILO 3. Demonstrate the ability to identify the appropriate management frameworks for an issue or situation under consideration, and to apply the tool or technique accurately.
- ILO 4. Make informed judgements in the absence of complete data.
- ILO 5. Undertake and show an ability for independent learning and an interest in advancing their knowledge and understanding and developing new skills to a high level.
- ILO 6. Demonstrate transferrable skills, including; time management, report writing and presentational and team working.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Integrate their learning from the PgCert.
- ILO 8. Demonstrate originality in the application of knowledge, including data and information collected by the student.
- ILO 9. Show self-direction and originality in tackling and solving problems.
- ILO 10. Possess a comprehensive understanding of the leading management literature.
- ILO 11. Demonstrate additional transferrable skills, including; consultancy, effective communication, cultural awareness and interpersonal team working and leadership.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 12. Integrate their learning from the PgCert and PgDip and apply it to a research project.

- ILO 13. Understand, have experience with, and confidently be able to apply management theories, tools and techniques and will have practised implementing theories and tools in a variety of situations including case studies, business simulations and the individual project.
- ILO 14. Demonstrate the ability to identify the appropriate management frameworks for an issue or situation under consideration, to apply the tool or technique accurately.
- ILO 15. Display practical capabilities in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 16. Carry out research using appropriate techniques and draw justifiable inferences from the data obtained.
- ILO 17. Critically evaluate and synthesis the published literature within and across management disciplines.
- ILO 18. Produce a high-quality thesis and critically evaluate the interpretations of the data.
- ILO 19. Undertake independent research on a relevant management subject, demonstrating the ability to plan, manage and execute an industrial, research based or internship project to realistic time scales.

• **How is the course taught?**

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. A management consultancy simulation will allow students to test their accumulated management understanding in a non-threatening environment. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course will be supported by an electronic learning environment (VLE - Blackboard) which will be the central repository for all information relating to the course and available to the students at all times. This will be supplemented by online module case packs. Additional practical expertise will be provided by visiting fellows and guest speakers. All modules will be taught in block format. Each assessed module comprises 25 hours of class contact time with a further 75 hours of study time to consolidate learning and carry out assignments, giving 100 notional learning hours per module. The thesis component of the module is in total 90 credits to reflect the fact that many students will be undertaking a 3-month internship over the May-September period.

The MSc in Management will be strongly differentiated from our existing MBA programmes. This will be achieved in a number of ways as follows by:

- Targeting the course at pre-work experienced graduates
- Utilising module material principally from, or developed for, existing MSc programmes
- Incorporating a multi-option thesis at the end of the programme
- Orientating career development towards a first line management position.
- Using a greater mix of theoretical input and simulation (for the MiM) as opposed to practical workshops and the case method (for the MBA).

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
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COMPULSORY MODULES:	
6 modules from modules 1-9	60
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-9 & 14	100
ELECTIVE MODULES:	
2 modules from modules 10-13	20
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 220 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-9, 14 & 15	110
Masters of Management Thesis (Internship) 16 or Masters of Management Thesis (Non-internship) 17	90
ELECTIVE MODULES:	
2 modules from modules 10-13	20
TOTAL:	220

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

The course will be offered on a full-time basis only. Full-time students register for the course in September and are expected to complete the course within 13 calendar months.

The course modules will be taught over terms 1, 2 and 3. The individual thesis project is undertaken during terms 3 and 4. In addition to the teaching methods outlined in section 3 above, students will be supported in their learning and personal development by:

- Welcome week
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions and 2 modules specifically
 - Organisational Behaviour
 - Management Consulting
- A Virtual Learning Environment (Canvas)
- Learning teams supported by an learning team tutor
- Provision of language classes. Mandatory for those with only one language and optional for those with more.

7. Course Level Assessment Strategy⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $< 40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module. For instance, modules - such as core modules in the areas of marketing, strategy, corporate sustainability, management consulting or operations management, or electives such as supply chain management or cross-cultural management - are supported by a number of formative tasks including group discussions, group exercises, case studies and oral presentations.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through the *Evidence-Based Management* module and meetings with their thesis supervisor.

Course modules – all Occ A unless specified

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (e.g., Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0		M-T-IND	SOM MSc Induction Week	Michael Dickman			0	Y		26/09/2022	30/09/2022		AO						
1		M-T/MMT	Strategic Marketing	Dr Marwa Tourky	20		10	Y	13/02/2023	13/02/2023	10/03/2023	40	ICW	100				06/04/2023	
2		M-T/OBA	Organisational Behaviour: Application	Dr Chia-yu Kou-Barrett	20		10	Y	03/10/2022	03/10/2022	21/10/2022	40	ICW	100				25/11/2022	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (e.g., Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3		M-L/ACF	Accounting and Finance	Dr Matthias Nnadi	20		10	Y	17/10/2022	17/10/2022	09/11/2022	40	EX	100				W/C 12/12/2022	23/03/2023
4		M-T/PML	People Management and Leadership	Dr Mengyi Xu	20		10	Y	07/11/2022	07/11/2022	23/11/2022	40	ICW	100				06/01/2023	
5		M-T/ECM	Economics for Managers	Prof Catarina Figueira	20		10	Y	04/10/2022	04/10/2022	03/11/2022	40	GCW	100				09/12/2022	
6		M-T/MNO	Managing Operations	Dr Abdelkader Aoufi	20		10	Y	08/02/2023	08/02/2023	17/02/2023	40	GCW	100				24/03/2023	
7		M-T/STG	Strategic Management	Dr Will Lewis	20		10	Y	09/01/2023	09/01/2023	30/01/2023	40	EX	100				20/03/2023	W/C 29/05/2023
8		M-T/MAC	Management Consulting	Dr Monica Franco-Santos	20		10	Y	24/04/2023	24/04/2023	24/05/2023	40	GCW	100				02/06/2023	
9		M-T/LCS	Leading Corporate Sustainability	Dr Namita Shete	20	5	10	Y	09/01/2023	09/01/2023	07/02/2023	40	ICW	100				10/03/2023	
10		M-T/ORP	Organisational Performance: Direction	Dr Rick Forster	20		10	N	21/11/2022	21/11/2022	06/12/2022	40	ICW	100				13/01/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
										Module Start Date (e.g., Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
														Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			Control and Measurement																	
11		M-T/ SCM	Supply Chain Management	Dr Lorenzo Prataviera	20		10	Y	27/02/2023	27/02/2023	15/03/2023	40	GCW	100					21/04/2023	
12		M-T/ ENT	Entrepreneurs hip	Dr Zimu Xu	20		10	N	23/02/2023	23/02/2023	13/03/2023	40	GCW	100					14/04/2023	
13		M-T/ MPM	Mastering Project Management	Dr Chantal Cantarelli	20		10	N	28/11/2022	28/11/2022	02/12/2022	40	GCW	100					20/01/2023	
14		M-T/ ECC	Effective Cross-Cultural Management	Prof Michael Dickmann	20		10	N	24/04/2023	24/04/2023	24/05/2023	40	GCW	100					23/06/2023	
15		M-T/ EBM	Evidence-Based Management	Prof Emma Parry	20		10	Y	11/04/2023	11/04/2023	21/04/2023	40	GCW	100					09/06/2023	
16		M-T/ THS	Masters of Management Thesis (Internship)	Prof Michael Dickmann	10		90	N	01/06/2023	01/06/2023	20/10/2023	50 50	ICW THESIS	30 70					20/10/2023 @ 14:00	
17		M-T/ THSNI	Masters of Management (Non-Internship)	Prof Michael Dickmann	10		90	N	01/06/2023	01/06/2023	20/10/2023	50	THESIS	100					20/10/2023 @ 14:00	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/ACF	Accounting and Finance	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management; Marketing and Leadership
M-T/MMT	Strategic Marketing	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/SCM	Supply Chain Management	Management	Management and Leadership
M-T/OBA	Organisational Behaviour: Application	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/ECM	Economics for Managers	Management	Management and Corporate Sustainability; Management and Leadership; Management and Human Resource Management
M-T/MNO	Managing Operations	Management	Management and Corporate Sustainability, Management and Entrepreneurship
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/MAC	Management Consulting	Management	Management and Leadership; Management and Human Resource Management
M-T-LCS	Leading Corporate Sustainability	Management	Management and Corporate Sustainability; Business and Strategic Leadership; Management and Leadership; Future Food Sustainability; Food Systems and Management; Environmental Management for Business; Management and Human Resource Management
M-T/EBM M-T/EBMA	Evidence-based Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Leadership; Exec Logistics and Supply Chain; Management and Human Resource Management
M-T/PML	People Management and Leadership	Management	Management and Leadership, Marketing and Leadership;

8. How are the ILOs assessed?

The following assessment types are utilised:

This is a full-time course conforming to the University's system of 10 credits (100 NLH) per module taken over 13 months comprising 220 credits in total. It will be assessed by conventional means: written assessment of cases (WACs), exams and group and individual assignments and a thesis project at the end of the programme. This thesis project will comprise 90 credits in total and will normally be linked to the 3-month internship. In the event that a student is unable to secure an internship or the internship is curtailed, for whatever reasons, there is an option to direct a student towards an empirical or systematic literature review similar to existing MSc students but the length of the thesis should reflect the additional credits and time available for the thesis.

This approach has been adopted because it is impossible to preclude the risk of companies curtailing an internship or that some students are not able to gain an internship.

This approach has been adopted because:

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Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs Module No.																			
	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14	ILO15	ILO16	ILO17	ILO18	ILO19
	Postgraduate Certificate						Postgraduate Diploma					MSc							
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
3	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓								
4	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓								
5	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓								
6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
7	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓								
8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
9	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓								
10							✓	✓	✓	✓	✓								
11							✓	✓	✓	✓	✓								
12							✓	✓	✓	✓	✓								
13							✓	✓	✓	✓	✓								
14							✓	✓	✓	✓	✓								
15													✓	✓	✓	✓			
16				ICW	ICW	ICW		ICW		ICW		THESIS	THESIS	THESIS	THESIS	THESIS	THESIS	THESIS	THESIS
17				ICW	ICW	ICW		ICW		ICW		THESIS	THESIS	THESIS	THESIS	THESIS	THESIS	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5-year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive understanding/knowledge of management with the practical skill set commensurate with entry to a first line managerial post. As such, many of the students will go into large organisations' graduate entry schemes but will equally be attractive to SMEs where the managerial component will add value to the student's technology or single discipline first degree. Evidence from current recruitment patterns for our young MSc students (on specialist MSc) already shows the trend toward graduate entry schemes and many companies are transferring their search to post-graduates rather than fresh graduates. Students are therefore typically recruited for early-career roles and graduate schemes in industry, banks, consultancies and other large organisations. However, this master's programme is also ideal for recent graduates seeking a conversion path into business management in order to give them an edge in today's job market. For example, employers want an engineer who can grasp marketing or an arts graduate with an ability to devise business plans. Finally, some students will want to develop their own businesses and the flexibility of the programme is that it can provide pathways for such students who want to move in this direction, e.g., by taking the entrepreneurship elective and opting to do an entrepreneurship internship or company-based project.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: May 2022

1. What is the course?

Course information

Course Title	Management and Corporate Sustainability
Course code	MSMPSFTC, PDMPSTFC, PCMPSTFC
Academic Year	2022-2023
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield
School(s)	School of Management
Theme	Leadership and Management
Centre	Policy, Sustainability and Performance
Course Director	Dr Namita Shete
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ – Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	1 year
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the School of Management, Leadership and Management Theme, Centre for Policy, Sustainability and Performance where the research interests include:

Business sustainability and Risk Management.

There are no academic partners for this course.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by The Chartered Management Institute (CMI.)

2. What are the aims of the course?

Cranfield University offers this course to add value to first degrees in Business and Management, Applied Science fields, Humanities and the Social Sciences. It seeks to develop candidates from different academic disciplines and backgrounds, with perhaps some relevant experience, who want to undertake a sustainability related qualification and future career.

The aim of the MSc in Management and Corporate Sustainability is to add value to applicants' first degrees by providing individuals with an integrated and critical awareness of management and organisations (e.g. private, public and third sector) and subsequently develop a specialised focus in corporate sustainability, and assisting them in pursuing entry level managerial careers within those organisations. More specifically it seeks to ensure the:

- Provision of a comprehensive and advanced understanding of the range of global sustainability challenges facing organisations in public, private and third sectors.
- Integration and application of in-depth knowledge and understanding of management sub-disciplines to support the development of corporate responsibility and sustainability initiatives.
- Ability of students to synthesise large elements of data to inform management decision making.
- Development of students to apply management and applied science concepts for improving the effectiveness of organisations in addressing sustainability issues.
- Coalescence of previous work experience and knowledge, concepts and theories creatively to enhance corporate sustainability policy and practice.
- Development of student capabilities to manage complex sustainability agendas and apply them in a practical and pragmatic way within a specific organisational context.
- Enhancement of lifelong learning through the development of management, sustainability, communication, team working, negotiation, project planning capabilities and self-direction, so students acquire the necessary high-level skills employers favour for making contributions to business, public service and society.

This is a predominantly pre-work experience programme intended for graduates from a wide range of backgrounds who are interested in developing a sustainability management related career. This course may also appeal to candidates with first degrees that are not in a business academic discipline but, have some relevant sustainability experience and would benefit from obtaining a post-graduate qualification as a developmental step in their career.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a systematic understanding of the principles of management and how these apply to corporate sustainability.
- ILO 2. Use new management skills to support decision making in the development of corporate sustainability strategy.
- ILO 3. Identify the appropriate sustainability management frameworks and methodologies to address specific sustainability issues.
- ILO 4. Show ability for independent learning and an interest in advancing knowledge and understanding.
- ILO 5. Demonstrate transferrable skills, including:- time management, general communication, negotiation, reflection, report writing and presentational and team working.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Integrate their learning from the PgCert.
- ILO 7. Critically review the application of current corporate responsibility and sustainability management research and evaluate its relevance to organisational practice.
- ILO 8. Exhibit originality and self-direction in the application of knowledge, including data and information collected by the student.
- ILO 9. Comprehensively appraise leading corporate responsibility and sustainability academic literature.
- ILO 10. Demonstrate additional transferrable skills, including; effective communication, consultancy, cultural awareness and interpersonal team working and leadership.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 11. Integrate their learning from the PgCert and PgDip and apply it to a research project.
- ILO 12. Independently and confidently apply management and corporate sustainability theories, tools/techniques to a variety of situations including case studies, business simulations and the individual project.
- ILO 13. Demonstrate the ability to create and adapt appropriate sustainability management frameworks and contextualise for a specific organisational issue accurately.
- ILO 14. Display practical ability in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 15. Judge appropriate research methodologies for conducting research, and draw justifiable inferences from the data and analysis generated.
- ILO 16. Critically synthesise and evaluate the academic research within and from related sustainability management disciplines.

- ILO 17. Undertake independent study (including empirical work) on a relevant corporate sustainability domain, demonstrating the ability to plan, manage and execute an industrial (private, public or charitable sectors) or research based project with specified time scales.
- ILO 18. Produce a thesis and critically evaluate the interpretations of the findings.

4. How is the course taught?

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. Additional practical expertise will be provided by visiting fellows and guest speakers.

Each assessed module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carryout assignments, giving a 100 notional learning hours.

The teaching methods are:

- Lectures
- Student centred learning/reflection
- Case studies
- Video and audio materials
- Simulation
- Tutorials
- Problem based learning projects
- Individual research project with academic supervisors

Students will be supported in their learning and personal development by:

- Welcome week
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions
- A Virtual Learning Environment (Canvas)

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

Six modules from 1-12 which must include 2 of the following: <ul style="list-style-type: none"> Leading Corporate Sustainability (8) Creating Sustainable Organisations (9) Green and Sustainable Finance (10) Applied Science and Technology for Environmental Sustainability (11) 	60
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
Thesis 13	80
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

The course will be offered on a full-time basis only. Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Each assessed module is based on 100 notional learning hours, comprising 20 class contact hours with a further 80 hours of private study to consolidate learning and to carry out assessments.

The majority of the course modules will be taught as a series of lectures within 1 or 2 week blocks within in first 3 terms of the 4 term framework. The Evidence-Based Management course will be taught in term 3. An international study tour is usually planned for term 2 or term 3 (subject to annual confirmation). The individual thesis project is undertaken during terms 3 and 4. Please note there may be some variation to module dates due to the scheduling of timetables across a number of academic programmes.

7. Course Level Assessment Strategy⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $< 40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through the Evidence-Based Management module and meetings with their thesis supervisor.

Course modules – all Occ A unless specified below

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment									
											Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
															Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0		M-T-IND	SOM MSc Induction Week	Namita Shete			0	Y	26/09/2022	30/09/2022			AO								
1		M-T/MMT	Strategic Marketing	Dr Marwa Tourky	20		10	Y	13/02/2023	13/02/2023	10/03/2023	40	ICW	100				06/04/2023			
2		M-T/OBA	Organisational Behaviour: Application	Dr Chia-yu Kou-Barrett	20		10	Y	03/10/2022	03/10/2022	21/10/2022	40	ICW	100				25/11/2022			

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3		M-L/ACF	Accounting and Finance	Dr Matthias Nnadi	20		10	Y	17/10/2022	17/10/2022	09/11/2022	40	EX	100				W/C 12/12/2022	23/03/2023
4		M-E/SEM	Social Entrepreneurship	Dr Richard Adams	20		10	Y	27/04/2023	27/04/2023	17/05/2023	40 40	GPRES ICW	50 50				25/05/2023 16/06/2023	
5		M-T/ECM	Economics for Managers	Prof Catarina Figueira	20		10	Y	04/10/2022	04/10/2022	03/11/2022	40	GCW	100				09/12/2022	
6		M-T/MNO	Managing Operations	Dr Abdelkader Aoufi	20		10	Y	08/02/2023	08/02/2023	17/02/2023	40	GCW	100				24/03/2023	
7		M-T/STG	Strategic Management	Dr Will Lewis	20		10	Y	09/01/2023	09/01/2023	30/01/2023	40	EX	100				20/03/2023	W/C 29/05/2023
8		M-T/LCS Occ B	Leading Corporate Sustainability	Dr Namita Shete	20	5	10	Y	28/11/2022	28/11/2022	08/12/2022	40	ICW	100				13/01/2023	
9		M-C/CSO	Creating Sustainable Organisations	Prof David Grayson	20		10	N	27/02/2023	27/02/2023	02/03/2023	40	GPRES	100				16/03/2023	
10		M-C/GSF	Green and Sustainable Finance	Dr Richard Adams	20		10	Y	20/01/2023	20/01/2023	26/01/2023	40	RP	100				24/02/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11		M-C/AST	Applied Science and Technology for Environmental Sustainability	Prof Phil Longhurst	20		10	N	17/11/2022	17/11/2022	24/11/2022	40	ICW	100				06/01/2023	
12		M-T/EBM	Evidence-based Management	Prof Emma Parry	20		10	Y	11/04/2023	11/04/2023	21/04/2023	40	GCW	100				09/06/2023	
13		M-C/THS	Thesis	Dr Namita Shete	10		80	N	01/05/2023	01/05/2023	08/09/2023	50	THESIS	100				08/09/2023 @ 14:00	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/ACF	Accounting and Finance	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management; Marketing and Leadership
M-T/MMT	Strategic Marketing	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management
M-T/OBA	Organisational Behaviour: Application	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management
M-E/SEM	Social Entrepreneurship	Management and Entrepreneurship	Management and Corporate Sustainability; Sustainability
M-T/ECM	Economics for Managers	Management	Management and Corporate Sustainability
M-T/MNO	Strategic Operations Leadership	Management	Management and Corporate Sustainability; Management and Entrepreneurship
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T-LCS	Leading Corporate Sustainability	Management	Management and Corporate Sustainability; Business and Strategic Leadership; Management and Leadership; Food Systems and Management; Environmental Management for Business; Management and Human Resource Management
M-T/EBM M-T/EBMA	Evidence based Management	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have 3 written examinations, 13 pieces of assessment by submitted work and one assessment by presentation (although there are formative assessment by presentation and debate) or no assessment by viva.

This mixed approach of assessment combined with examinations has been adopted in order to adopt a range of assessment with presentations which are not formally assessed.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18
Module No.																		
	Postgraduate Certificate					Postgraduate Diploma					MSc							
1	√				√	√				√								
2	√				√	√				√								
3	√				√	√				√								
4						√	√	√	√	√	√							
5	√				√	√				√								
6	√				√	√				√								
7	√				√	√				√								
8	√		√		√	√	√		√	√								
9	√		√		√	√	√		√	√								
10	√	√	√	√	√	√	√	√	√	√								
11	√	√	√		√	√	√		√	√								
12													√	√	√	√	√	√
13		√	√	√			√	√	√	√	√	√	√	√	√	√	√	√

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive and integrated understanding/knowledge of sustainability management with the practical skill set commensurate with entry to a first line managerial post. As such, many of the students may pursue graduate entry schemes but will equally be attractive to large and SME commercial, public sector and charitable sectors where the managerial component will add value to the student's technology based or single disciplined first degree. Evidence from current recruitment patterns for our young MSc students (on specialist MSc) already shows the trend toward graduate entry schemes and many companies transferring their talent search to post-graduates rather than fresh graduates alone.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: May 2022

1. What is the course?

Course information

Course Title	MSc in Management and Entrepreneurship
Course code	MSMERFTC, PDMERFTC, PCMERFTC
Academic Year	2022-2023
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Management
Theme	Leadership and Management
Centre	Bettany Centre for Entrepreneurship
Course Director	Dr Oksana Koryak
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the Bettany Centre for Entrepreneurship at the School of Management (SOM) where the research interests include:

- Growth of entrepreneurial ventures
- Forecasting the entrepreneurial sector
- Entrepreneurial finance and de-risking ventures
- Intellectual property rights and market performance
- The impact of business planning on new venture performance
- Entrepreneurial Strategy
- Family business management
- Corporate entrepreneurship
- Women's entrepreneurship

Teaching and/or assessment is provided by SOM Faculty as well as selected visiting fellows (already teaching on the MSc in Management (MiM) programme or working in other renowned universities in the field of Entrepreneurship and Enterprise Development. Thesis projects will be mainly supervised by Bettany Centre for Entrepreneurship faculty and those PhD students who have a Recognised Teacher Status. The students will have an option either to do a research project or to create a business plan for a new entrepreneurial venture or to conduct a growth audit for an existing entrepreneurial venture.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by The Chartered Management Institute (CMI).

2. What are the aims of the course?

In this world of downsizing, restructuring and technological change, notions of traditional careers have been challenged. More and more individuals are aspiring to create their own world of unlimited opportunities. Not only individuals, but governments have recognised the positive impact of entrepreneurship on the economic development. There's no single Government (in either the developed or the developing world), which is not paying at least lip service to entrepreneurship promotion and enterprise development. Because they have realised that entrepreneurs are empowering change through new business models and bringing hope to millions of people world-wide. The research shows that majority of entrepreneurial ventures fail in the first few years of their existence. Most of the failures are because their owner-managers lack basic management skills.

They do things on hit and trial basis, by learning these skills in the wild - and that's where Cranfield's MSc Management and Entrepreneurship Course makes a difference – by equipping our students with both the entrepreneurial characteristics and traits as well as management skills so that they can start and run their businesses in an effective and efficient manner.

Cranfield University offers this course in order to add value to first degrees in Business and Management, Economics, Applied Science fields, Humanities and Social Sciences. It seeks to develop candidates from different academic disciplines and backgrounds, with perhaps some relevant although limited experience, who want to either start their own business or grow their family business entrepreneurially or manage a large organisation in an entrepreneurial manner.

The aim of the MSc in Management and Entrepreneurship is to add value to applicants' first degrees by providing individuals with an integrated and critical awareness of management and organisations (e.g. private, public and third sector) and subsequently, develop a specialised focus in entrepreneurship, and assisting them in pursuing an entrepreneurial career. More specifically it seeks to ensure the:

- Provision of a comprehensive and advanced understanding of the impact of entrepreneurship and entrepreneurial processes at international, regional and national levels, the community level and the level of firm and individual.
- Integration and application of in-depth knowledge and understanding of management sub-disciplines to support the start-up and growth of entrepreneurial ventures.
- Provision of opportunities for students to develop critical perspectives on theories and to review and evaluate the appropriateness and potential value of concepts, models and techniques that underpin the constituent entrepreneurship and management subjects.
- Development of student capabilities to critically analyse the current issues in the field of management and entrepreneurship.
- Enhancement of lifelong learning through the development of management and entrepreneurship knowledge, communication, team working, negotiation, project planning capabilities and self-direction, so students acquire the necessary high-level skills employers favour for making contributions to their own and/or family businesses, social enterprises, or large organisations interested to introduce entrepreneurial culture as a tool for business growth.

This is a predominantly pre-work experience programme intended for graduates from a wide range of backgrounds including science, engineering and technology who are interested in developing a career in entrepreneurship and enterprise development. This course may also appeal to candidates with first degrees that are not in a business academic discipline but that would benefit from obtaining a post-graduate qualification that combines management and entrepreneurship as a developmental step in their career.

This course has been designed not only to teach 'about' theory of entrepreneurship. We aim to prepare our student 'for' spotting opportunities, generating ideas and being creative and innovative enough to raise resources to implement those ideas successfully. We will achieve this goal 'through' a range of inclusive and interactive teaching pedagogies and learning methods – delivered by a team of entrepreneurial faculty members, who have either started and managed their own businesses or have been engaged with real-life entrepreneurs, either through conducting research, or by providing consultancy, coaching, and mentoring.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a systematic application and a critical awareness of current management and entrepreneurship research and to evaluate its relevance to industrial and commercial practice.
- ILO 2. Show a conceptual understanding that enables the student to evaluate critically current research and/or methodologies, develop critiques of them, and, where appropriate, adapt them.

- ILO 3. Demonstrate the ability to identify the appropriate management and entrepreneurship frameworks for an issue or situation under consideration, and to apply the tool or technique accurately.
- ILO 4. Undertake and show an ability for independent learning and an interest in advancing their knowledge and understanding and developing new skills to a high level.
- ILO 5. Justify and defend the ability for independent learning and an interest in advancing knowledge and understanding and developing new skills to a high level demonstrated through critical thinking, strategic comparison and review.
- ILO 6. Evaluate the entrepreneurial characteristics, entrepreneurial processes, and the entrepreneurial event in different social, economic, political and legal environments.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Select and apply different tools available for creating new business opportunities, and of different forms of support available to entrepreneurs and how to utilise that support in an effective manner.
- ILO 8. Independently apply entrepreneurship theories, concepts, models, tools and techniques to a variety of situations including case studies, business simulations and the individual project.
- ILO 9. Adapt appropriate management and entrepreneurship frameworks and contextualise them for specific issues accurately in start-up and growth stages of entrepreneurial ventures.
- ILO 10. Exhibit originality in the application of knowledge, together with a practical understanding of how established techniques of research and inquiry in entrepreneurship are used to create and interpret knowledge in the discipline.
- ILO 11. Show self-direction and originality in tackling and solving problems both in the start-up and growth stages of entrepreneurial ventures.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 12. Integrate their learning from the PgCert and PgDip and apply it to a research project or to prepare a business plan.
- ILO 13. Critically evaluate and synthesise the published literature within and across the entrepreneurship and management disciplines either for their research project or for preparing a business plan.
- ILO 14. Conduct independent study on a relevant entrepreneurship/management domain, demonstrating the ability to plan, manage and execute a research-based project with specified timescales, or prepare a detailed business plan for a new entrepreneurial venture demonstrating an ability to plan, access and mobilise resources for new venture.
- ILO 15. Produce a high-quality thesis or a business plan and critically evaluate the interpretations of the data available.

4. How is the course taught?

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem-solving skills. Additional practical expertise will be provided by guest speakers.

Each assessed module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving a 100 notional learning hours.

The teaching methods are:

- Lectures

- Student centred learning/reflection
- Case studies
- Video and audio materials
- Simulation
- Tutorials
- Problem-based learning projects
- Individual research project with academic supervisors

In addition to the teaching methods outlined above,

Students will be supported in their learning and personal development by:

- Welcome week
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions
- A Virtual Learning Environment (Canvas)

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

Management and Entrepreneurship

A - Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
6 modules from modules 1 - 8	60
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B - Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 - 12	120
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	120

C - MSc

An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1–12	120
Module 13	0
Thesis 14 (Thesis)	80
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Each assessed module is based on 100 notional learning hours, comprising 20 class contact hours with a further 80 hours of private study to consolidate learning and to carry out assessments.

7. Course Level Assessment Strategy⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through the Evidence-Based Management module and meetings with their thesis supervisor.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules – all Occ A unless specified

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0		M-T-IND	SOM MSc Induction Week	Oskana Koryak			0	Y		26/09/2022	30/09/2022		AO						
1		M-T/MMT	Strategic Marketing	Dr Marwa Tourky	20		10	Y	13/02/2023	07/03/2023	10/03/2023	40	ICW	100				06/04/2023	
2		M-T/OBA	Organisational Behaviour: Application	Dr Chia-yu Kou-Barrett	20		10	Y	03/10/2022	03/10/2022	21/10/2022	40	ICW	100				25/11/2022	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3		M-L/ACF	Accounting and Finance	Dr Matthias Nnadi	20		10	Y	17/10/2022	17/10/2022	09/11/2022	40	EX	100				W/C 12/12/2022	23/03/2023
4		M-E/ENT	Entrepreneurship	Dr Oksana Koryak	20		10	N	05/10/2022	05/10/2022	19/10/2022	40	ICW	100				18/11/2022	
5		M-E/ENF	Entrepreneurial Finance	Dr Stephanie Hussels	20		10	N	27/10/2022	27/10/2022	01/11/2022	40	GCW	100				06/01/2023	
6		M-E/MBG	Managing Business Growth	Dr Oksana Koryak	20		10	N	23/01/2023	23/01/2023	06/02/2023	40	ICW	100				03/03/2023	
7		M-T/MNO	Managing Operations	Dr Abdelkader Aoufi	20		10	Y	08/02/2023	08/02/2023	17/02/2023	40	GCW	100				24/03/2023	
8		M-T/STG	Strategic Management	Dr Will Lewis	20		10	Y	09/01/2023	09/01/2023	30/01/2023	40	EX	100				20/03/2023	W/C 29/05/2023
9		M-E/PME	Project Management for Entrepreneurs	Dr Elmar Kutsch	20		10	N	21/11/2022	21/11/2022	23/11/2022	40	ICW	100				13/01/2023	
10		M-E/CEN	Corporate Entrepreneurship	Dr Zimu Xu	20		10	N	27/02/2023	27/02/2023	09/03/2023	40	ICW	100				14/04/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11		M-E/FBM	Family Business Management	Dr Stephanie Hussels	20		10	N	24/04/2023	24/04/2023	05/05/2023	40	GCW	100				26/05/2023	
12		M-E/SEM	Social Entrepreneurship	Dr Richard Adams	20		10	Y	27/04/2023	27/04/2023	17/05/2023	40	GPRES	50				25/05/2023	
											40	ICW	50				16/06/2023		
13		M-T/EBMA	Evidence-Based Management	Prof Emma Parry	20		10	Y	11/04/2023	11/04/2023	21/04/2023	N/A	A/O	N/A				N/A	
14		M-E/THS	Thesis	Dr Oksana Koryak	10		80	N	01/05/2023	01/05/2023	08/09/2023	50	THESIS	100				08/09/2023 @ 14:00	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/ACF	Accounting and Finance	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management; Marketing and Leadership
M-T/MMT	Strategic Marketing	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/OBA	Organisational Behaviour: Application	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/MNO	Managing Operations	Management	Management and Corporate Sustainability, Management and Entrepreneurship
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-E/SEM	Social Entrepreneurship	Management & Entrepreneurship	Management and Corporate Sustainability; Sustainability
M-T/EBMA M-T/EBM	Evidence-based Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management; Management and Leadership; Exec Logistics and Supply Chain

8. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have 4 written examinations and 11 assignments, of which one is the thesis. No elements of assessment are done by presentation (although there are formative assessments by presentation and debate) or by viva.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
1	√	√	√	√	√										
2	√	√	√	√	√										
3	√	√	√	√	√										
4	√	√	√	√	√	√	√	√							
5	√	√	√	√	√	√	√	√							
6	√	√	√	√	√	√	√	√							

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
7	√	√	√	√	√										
8	√	√	√	√	√										
9	√	√	√	√	√		√								
10						√	√	√	√	√	√				
11						√	√	√	√	√	√				
12						√	√	√	√	√	√				

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
13	NOT ASSESSED														
14	√				√	√	√	√	√		√	√	√	√	√

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels

are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive and integrated understanding/knowledge of entrepreneurship and management with the practical skill set suitable for either business start-up/growth or working in a large organisation as an intrapreneur. Once graduate, many of the students may be able to launch and grow their own businesses or may become actively involved in the management of their family's business. In addition, there is even a possibility to pursue a career as a social entrepreneur or a corporate entrepreneur/intrapreneur to lead and manage a larger organisation in an executive/employee capacity.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: May 2022

1. What is the course?

Course information

Course Title	MSc in Management and Human Resource Management
Course code	MSMHRFTC
Academic Year	2022-2023
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Changing World of Work
Course Director	Dr Mengyi Xu
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the School of Management (SOM), Leadership and Management Theme. All but three of the modules are existing modules currently taught on the MSc in Management pathway courses offered by SOM. Teaching is provided by SOM Faculty and selected lectures and case studies by Visiting Fellows/Professors. Cranfield University School of Management remains fully responsible for the quality of delivery and assessment of the course. It also provides a set of human resource management modules which can be offered to other students in the University.

Interactions with outside organisations currently take the form of:

- Teaching/instruction from external academic, industry representatives and other guest speakers.
- Individual thesis projects will be offered to and by various organisations (including not-for-profit and voluntary organisations).

A programme advisory board will be set up for the course as a subgroup of the existing MiM advisory board. Members will be drawn from recommendations made by relevant module convenors and TLG leads.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The programme is double accredited by the Chartered Institute of Personnel and Development (CIPD) and the Chartered Institute of Management (CMI).

What are the aims of the course?

Cranfield University offers this course in order to add value to first degrees, by developing in students a critical awareness of management and organisations, with a specific focus on human resource management and to assist them in taking on roles in HRM at managerial career entry level upon graduation.

The objectives of the course are as follows:

1. To prepare students for the world of work in a human resource management role, through balancing theoretical perspectives and practical application.
2. To enable the advanced study of organisations, their management, focusing in particular on the management of human resources and the changing external context in which they operate.
3. To develop of a range of business knowledge and skills appropriate for career entry to human resource management, together with self-awareness and personal development.
4. To develop the ability to apply concepts and theories to complex management situations, both systematically and creatively to add value to the employing organisation.
5. To enhance lifelong learning through the development of transferable intellectual and study skills and personal development to enable self-direction and creativity, in order to contribute to business, the economy and society at large.

This programme is intended for the following range of students:

This is a pre-work experience programme intended primarily for graduates from a non-business/management discipline looking to develop key managerial and specific human resource management skills commensurate with career entry opportunities but is also open to those who have graduated in a different business specialism (e.g. Accounting). We also anticipate that some students who already have a higher education degree in a technical area but lack managerial experience and who would therefore not meet the relevant work experience qualification for the MBA, might also be interested in joining this MSc programme.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the award, a student should be able to:

- ILO 1. Critically evaluate current management and HRM research and apply it to relevant organisational contexts.
- ILO 2. Appraise appropriate management and HRM frameworks and ideas for an issue or situation under consideration and apply tools or techniques appropriately.
- ILO 3. Make informed judgements in the absence of complete data.
- ILO 4. Undertake and show ability for independent learning and an interest in advancing their knowledge and understanding and developing new skills to a high level.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a student would also be expected to:

- ILO 5. Assess and evaluate existing knowledge and evidence, including data/information collected by the student.
- ILO 6. Show self-direction and originality in formulating potential solutions to management problems.
- ILO 7. Critically appraise the ideas central to the leading management and HRM literature.
- ILO 8. Apply additional transferrable skills, including consultancy, effective communication, cultural awareness and interpersonal team working and leadership.

C. MSc

In addition to the intended learning outcomes outlined above, a student would also be expected to:

- ILO 9. Display capabilities in self-directed research including critical evaluation and synthesis of relevant literature, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 10. Undertake independent research on a relevant human resource management subject, demonstrating the ability to plan, manage and execute a research based project to realistic timescales.

4. How is the course taught?

The overall aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. A management consultancy simulation will allow students to test their accumulated management understanding in a non-threatening environment. Group project work, reflective practice and class exercises are used to develop application and problem solving skills. The course will be supported by an electronic learning environment (VLE - Canvas) which will be the central repository for all course materials and available to the students at all times. Additional practical expertise will be provided by visiting fellows and guest speakers. All modules

will be taught in block format. Each assessed module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving 100 notional learning hours per module. The thesis component of the module is in total 80 credits.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 4 and 10 credits from modules 9-13	20
30 credits from modules 1-2 and 4-6	30
ELECTIVE MODULES:	
10 credits from modules 7-8	10
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-6 and modules 9-14	110
ELECTIVE MODULES:	
10 credits from modules 7-8	10
TOTAL:	120

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must attend module 13, Evidence Based Management (which is assessed through the Thesis) and successfully complete the MSc thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-6 and modules 9-13	110
Module 14	0
Module 15	80
ELECTIVE MODULES:	
10 credits from modules 7-8	10

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

The course will be offered on a full-time basis only. Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

The course modules will be taught over terms 1, 2 and 3. The individual thesis project is undertaken during terms 3 and 4. In addition to the teaching methods outlined in section 3 above, students will be supported in their learning and personal development by:

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $< 40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

- Welcome week
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions and 2 modules specifically
 - Organisational Behaviour: Application
 - Management Consulting
- A Virtual Learning Environment (Canvas)

Formative feedback will be provided through in- class discussion and exercises, as well as through faculty led debates on the conceptual material introduced during each session.

7. Course Level Assessment Strategy⁵

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through the Evidence-Based Management module and meetings with their thesis supervisor.

⁵ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules – all Occ A unless specified below

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
1		M-T/OBA	Organisational Behaviour: Application	Dr Chia-Yu Kou-Barrett	20		10	Y	03/10/2022	03/10/2022	21/10/2022	40	ICW	100				25/11/2022	
2		M-L/ACF	Accounting and Finance	Dr Matthias Nnadi	20		10	Y	17/10/2022	17/10/2022	09/11/2022	40	EX	100				W/C 12/12/2022	23/03/2023
3		M-T/PML	People Management	Dr Mengyi Xu	20		10	Y	07/11/2022	07/11/2022	23/11/2022	40	ICW	100				06/01/2023	

⁶ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁷ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁸ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁹ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

¹⁰ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgical reason and where each element forms part of a continuous learning and assessment experience for students.

¹¹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹² Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
			and Leadership																
4		M-T/ECM	Economics for Managers	Prof Catarina Figueira	20		10	Y	04/10/2022	04/10/2022	03/11/2022	40	GCW	100				09/12/2022	
5		M-T/STG	Strategic Management	Dr Will Lewis	20		10	Y	09/01/2023	09/01/2023	30/01/2023	40	EX	100				20/03/2023	W/C 29/05/2023
6		M-T/MAC Occ B	Management Consulting	Dr Mengyi Xu	20		10	Y	02/05/2023	02/05/2023	12/05/2023	40	GCW	100				09/06/2023	
7		M-T/MMT	Strategic Marketing	Dr Marwa Tourky	20		10	Y	13/02/2023	13/02/2023	10/03/2023	40	ICW	100				06/04/2023	
8		M-T/LCS	Leading Corporate Sustainability	Dr Namita Shete	20		10	Y	09/01/2023	09/01/2023	07/02/2023	40	ICW	100				10/03/2023	
9		M-H/PMR	Performance Management and Rewards	Dr Monica Franco-Santos	20	5	10	N	31/01/2023	31/01/2023	31/01/2023	40	EX	100				22/03/2023	W/C 29/05/2023
10		M-H/TSC	Talent Sourcing and Career Management	Prof Michael Dickmann	20		10	N	22/11/2022	22/11/2022	29/11/2022	40	ICW	100				13/01/2023	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
11		M-H/ERE	Employment Relations and Engagement	Prof Clare Kelliher	20		10	N	27/02/2023	27/02/2023	03/03/2023	40	ICW	100				14/04/2023	
12		M-H/CH R	Contemporary Approaches to Human Resource Management	Prof Emma Parry	20		10	N	24/04/2023	24/04/2023	27/04/2023	40	ICW	100				26/05/2023	
13		M-H/DO C	Developing Organisational Culture	Prof Richard Kwiatkowski	20		10	N	08/03/2023	08/03/2023	14/03/2023	40	ICW	100				21/04/2023	
14		M-T/EBMA	Evidence-Based Management	Prof Emma Parry	20		0	Y	11/04/2023	11/04/2023	21/04/2023	N/A	A/O	N/A				N/A	
15		M-H/THS	Thesis	Dr Mengyi Xu	20		80	N	01/05/2023	30/05/2023	08/09/2023	50	Thesis	100				08/09/2023 @ 14:00	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/ACF	Accounting and Finance	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Human Resource Management; Marketing and Leadership
M-T/MMT	Strategic Marketing	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/OBA	Organisational Behaviour: Application	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/ECM	Economics for Managers	Management	Management and Corporate Sustainability; Management and Leadership; Management and Human Resource Management
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Human Resource Management
M-T/MAC	Management Consulting	Management	Management and Leadership; Management and Human Resource Management
M-T-LCS	Leading Corporate Sustainability	Management	Management and Corporate Sustainability; Business and Strategic Leadership; Management and Leadership; Future Food Sustainability; Food Systems and Management; Environmental Management for Business; Management and Human Resource Management
M-T/EBM M-T/EBMA	Evidence-based Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship; Management and Leadership; Exec Logistics and Supply Chain; Management and Human Resource Management
M-T/PML	People Management and Leadership	Management	Management and Leadership, Marketing and Leadership; Management and Human Resource Management

8. **How are the ILOs assessed?**

The following assessment types are utilised:

This is a full-time course conforming to the University's system of 10 credits (100 NLH) per module taken over 12 months comprising 200 credits in total. It will be assessed by conventional means: written assessment of cases (WACs), exams and group and individual assignments and a thesis project at the end of the programme. This thesis project will comprise 80 credits.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs										
Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10
	Postgraduate Certificate				Postgraduate Diploma				MSc	
1	✓		✓	✓	✓	✓		✓		
2	✓		✓	✓	✓	✓				
3	✓	✓	✓	✓	✓	✓	✓	✓		
4	✓		✓	✓	✓	✓				
5	✓		✓	✓	✓	✓	✓			
6	✓		✓	✓	✓	✓	✓			
7	✓		✓	✓	✓	✓		✓		
8			✓	✓	✓	✓		✓		
9	✓	✓	✓	✓	✓	✓	✓	✓		
10	✓	✓	✓	✓	✓	✓	✓	✓		
11	✓	✓	✓	✓		✓	✓	✓		
12	✓	✓	✓			✓	✓	✓		
13	✓	✓		✓	✓	✓		✓		
14			✓						✓	
15									✓	✓

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. **How will the University assure the quality of the provision?**

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in

particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the

learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive understanding/knowledge of management generally and human resource management more specifically, together with the practical skill set commensurate with entry to a first line human resource management post. As such, many of the students are expected to go into large organisations' graduate entry schemes but will equally be attractive to SMEs where the need for specialist knowledge about managing people will add value to the student's technology or single discipline first degree. Evidence from current recruitment patterns for our young MSc students (on specialist MSc) already shows the trend toward graduate entry schemes and many companies transferring their search to post-graduates, rather than fresh graduates. Students are therefore typically recruited for early-career roles and graduate schemes in industry, banks, consultancies and other large organisations. However, this Masters programme is also ideal for recent graduates seeking a conversion path into a career in human resource management.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: August 2022

1. What is the course?

Course information

Course Title	MSc in Management and Information Systems
Course code	MSMGIFTC, MSMGIPTC, PDMGIFTC, PDMGIPTC, PCMGIFTC, PCMGIPTC
Academic Year	2022-2023
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	N/A
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing and Materials
Centre	Centre for Digital Engineering and Manufacturing
Course Director	Dr Samir Khan
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	N/A
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgDip - one year, Part-time PgDip - two years, Full-time PgCert - one year, Part-time PgCert - two years
Course Start Month(s)	Full-time: September. Part-time: throughout the year

Institutions delivering the course

This course is delivered by The School of Aerospace, Transport and Manufacturing, Manufacturing and Materials Theme, Centre for Digital Engineering and Manufacturing, where the research interests include:

- Product-Service Systems
- Services and Supply Chain Management
- Enterprise Scale IT/OT (Information / Operational Technology) and Internet of Things (IoT)
- Data Analytics
- Simulation and Modelling
- Industry 4.0 and Wider Manufacturing Challenges
- Change and Innovation Management
- Enterprise Asset and Maintenance Management
- Digital Services

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This MSc course is accredited by The Institution of Engineering and Technology (IET) on behalf of the Engineering Council as further learning for CEng until August 2025, The Institution of Mechanical Engineers (IMechE) on behalf of the Engineering Council as further learning for CEng until August 2026, and The Royal Aeronautical Society on behalf of the Engineering Council as further learning for CEng until August 2026. Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

The aim of this course is:

- To provide graduates with knowledge and skills required to enable them to apply management and information systems in an effective way to solve management problems in industrial, commercial and governmental organisations.
- To further develop suitably trained and qualified individuals and enable them through digital tools and technologies to make an immediate contribution to a company's performance and operation, and to progress into senior management positions.

Cranfield University offers this course in order to:

- Provide graduates with the knowledge and skills necessary to enable them to understand the theories behind the major tools and techniques available for problem solving within Management and Information Systems.
- Equip students to understand the needs addressed by the above tools and techniques.

- Expose students to tools and techniques to identify and analyse management problems, propose solutions and to select and implement a solution to support the business need.
- Develop students' ability to demonstrate, through group project and individual thesis, expertise in solving management problems.

This programme is intended for the following range of students:

- Those wishing to work nationally or internationally to practice effective technology enabled management, whether in engineering, IT or other sectors.
- Those wishing to work in information technology solution vendors and implementation consultancy.
- Those wishing to work in the public/government sector on industry competitiveness and productivity issues.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate an awareness of the principles and theories behind the major techniques and tools available for problem solving in the areas of Management and Information Systems.
- ILO 2. Critically evaluate the theory behind; and the selection of appropriate analysis, design and development tools and apply them to solve business problems in terms of Information Systems and/or organisations.
- ILO 3. Critically evaluate previous and current research and methodologies, and determine their relevance to a given manufacturing, industrial, business or commercial problem.
- ILO 4. Acquire and use Data, Information and Knowledge effectively, and apply appropriate techniques and tools to identify and analyse management problems and to propose solutions.
- ILO 5. Use independent learning skills to continuously advance their knowledge and understanding of Management and Information Systems.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Demonstrate key management and personal management skills needed to influence and implement change.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Undertake independent research on a subject relevant to management and information systems involving project planning, development of new skills, critical evaluation of literature, evaluation of results, and discussion of findings and writing a thesis.

4. How is the course taught?

The MSc course has three components: taught modules (40%), group projects (20%), and an individual research project (40%). The taught modules are typically delivered in one-week blocks between October and February.

The teaching methods include use of Virtual Learning environment and blended learning, with a combination of synchronous and self-paced learning lectures, case studies, group exercises, field visits,

seminars and computer-based demonstrations and exercises. All students attend a week of introductory lectures (given during the first week of the course). Within this induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. Induction is followed by 8 assessed modules, each module has a one week residential component plus pre-work and post-study.

All MSc students undertake a Group Project. The Group projects are group-based activities typically undertaken for 12 weeks between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation. The Group Project will typically involve a team of between 5 and 8 students, working to investigate a business opportunity or solve a business problem. Part-time Students are encouraged to take the Group Project component and only in exceptional circumstances, and with approval from the Group Project Co-ordinator, will be permitted to replace the Group Project with an individual dissertation. The topic is to be agreed between the University and the student.

All MSc students will undertake an individual research project (thesis project) under the supervision of a member of academic staff. For the individual research project, each student is allocated a supervisor. Guidance sessions are provided as to what is required from the thesis and oral presentation.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2, 3, 4 and 6 Module 1	40
ELECTIVE MODULES:	
Modules 5, 7, 8 and 9 (Select 2)	20
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 Module 1 Group Project (10a)	80 0 40
TOTAL:	120

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Module 1	0
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Module 1	0
Group Project (10a)	40
Individual Research Project (11)	80
TOTAL:	200

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Module 1	0
Individual Research Project (11)	80
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. The typical case is to complete four taught modules plus a Dissertation in year 1 and the remainder of the modules plus the Thesis in year two and/or year 3.

7. Course Level Assessment Strategy⁴

The course assessment strategy involves a multitude of methods, including exams and assignments for summative assessment, inclusive of individual and group elements, and a range of in-module activities for formative assessment. These are designed so that the learners construct their own learning through relevant learning activities which take place before, during, and after the modules as well as during the learner's engagement with group and individual projects work. The relevant activities are directly relevant to the Intended Learning Outcomes (ILOs) and challenge the students to develop and demonstrate the full range of skills and knowledge required to succeed in their professional careers as management and information systems specialists, as specified at the individual modules and are aligned with the course-level ILOs. The attainment of ILOs is assessed through formative and summative assessment of varying length and nature, which are linked to both individual and group activities and are clearly stated in the individual module descriptors, enabling students with different learning styles to express their learning achievements linked to professional practice and these achievements to be appropriately assessed. Students have opportunities to develop communication skills, as they are required to give presentations individually and as members of a group. Formative assessment feedback is given verbally during the modules and involve both tutor-led and peer learning feedback during the module activities, case studies, and presentations, but also during interactive learning activities, which incorporate such formative feedback. The taught components precede the group and individual research project, so assessment can be used to develop skills required for these projects. Learners are expected to develop self-directed goal

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

attainment skills in this is assessed through their group and individual project reports and presentations, which are assessed according to the specified assessment criteria. All assessment criteria are made available in advance to the students and provided feedback is aligned with these criteria.

Course modules

The following modules outline all parts of the programme leading to **Msc**. Other awards associated with the course include some or all of these modules.

	Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
1	I-MAT-INWK	Introduction	Dr Sue Impey	39		0	Y	28/09/22	03/10/22	07/10/22	N/A	AO	N/A				N/A			
2	I-MNU-A1031	Enterprise Systems	Dr Ip-Shing Fan	32		10	Y	21/11/22	28/11/22	02/12/22	50	ICW	100				16/01/23	TBC – if required		
3	I-MNU-A1034 Occ A	Operations Management	Dr Mohamed Shararah	32		10	Y	10/10/22	10/10/22	14/10/22	50	EX	100				12/12/22	Manufacturing resit exams will be during week		

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear and pedagogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

	Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																			commencing 15/05/23	
4	I-MNU-DAAI	Data Analytics and AI	Dr Samir Khan	32		10	N	24/10/22	31/10/22	04/11/22	50	ICW	100					04/12/22	TBC – if required	
5	I-MNU-IDM	Integrated Data Management	Dr Christina Latsou	32		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100					20/02/23	Manufacturing resit exams will be during week commencing 15/05/23	
6	I-GPD-A1507	Digital Engineering	Dr John Ahmet Erkoyuncu	32		10	Y	17/10/22	17/10/22	21/10/22	50	GCW	100					18/11/22	TBC – if required	
7	I-MNU-A1007	Data Analytics	Dr Cristobal Ruiz-Carcel	32		10	N	31/10/22	07/11/22	11/11/22	50	ICW	100					12/12/22	TBC – if required	
8	I-KME-A1037	Enterprise Modelling	Dr John Ahmet Erkoyuncu	32		10	Y	21/11/22	21/11/22	25/11/22	50	GCW	100					04/01/23	TBC – if required	
9	I-MNU-A1038	Supply Chain Management	Mr. John Patsavellas	32		10	Y	09/01/23	09/01/23	13/01/23	50	GCW	100					06/02/23	TBC – if required	
10a	I-MAT-GRPP	Group Project	Dr David Ayre	20		40	Y	30/01/23	30/01/23AFT	25/04/23FT	50	GPRES GCW	16 64 10					25/04/23 02/05/23		

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

	Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
			Dr Iva Chianella						06/02/23Occ B PT	01/08/23PT	50	ICW IPRAC	10				02/05/23 02/05/23			
									cc B PT	T		GPRES GCW ICW IPRAC	16 64 10 10				25/07/23 01/08/23 01/08/23 01/08/23			
10b	I-MAT-DISS	Dissertation for Part Time Students	Dr David Ayre (Dr Konstantinos Salonitis)	20		40	Y	06/02/23	06/02/23	25/08/23	50	ICW ICW	90 10				25/08/23 25/08/23			
11	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y	06/02/23	Occ A = PT 06/02/23	PT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23			
			Dr Muhammad Khan						28/04/23	Occ B = FT 28/04/23		FT 25/08/23							50	THESIS IPRES

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAT-INWK	Introduction	Advanced Materials	Engineering & Management of Manufacturing Systems, Aerospace Manufacturing, Global Product Development and Management, Maintenance Engineering and Asset Management, Manufacturing Technology and Management Aerospace Materials Welding Engineering and Metal Additive Manufacturing
I-MNU-A1031	Enterprise Systems	Management and Information Systems	Engineering & Management of Manufacturing Systems,
I-GPD-A1507	Digital Engineering	Global Product development and management	Aviation Digital Technology Management
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Global Product Development and Management, Aerospace Manufacturing, Manufacturing and Technology Management, and Metal Additive Manufacturing
I-KME-A1037	Enterprise Modelling	Management and Information Systems	Global Product Development and Management
I-MNU-A1038	Supply Chain Management	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing, Global Product Development and Management
I-MAT-DISS	Dissertation for Part Time Students	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Aerospace Manufacturing, Engineering & Management of Manufacturing Systems, Global Product Development and Management, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management
I-MAT-GRPP	Group Project	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Engineering & Management of Manufacturing Systems, Aerospace Manufacturing, Global Product Development and Management, Welding Engineering, Metal Additive Manufacturing, Maintenance

			Engineering and Asset Management,
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Engineering & Management of Manufacturing Systems, Global Product Development and Management, Aerospace Materials, Manufacturing Technology and Management, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management, Advanced Materials

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have one written examination, four pieces of individual assessment by submitted work, three pieces of group assessment by submitted work (including an assessment of personal contribution to group work), and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to perform formative and summative assessments of the students to demonstrate their ability in a range of contexts. Part-time students can be allowed to undertake a dissertation in place of the group project work where it can be demonstrated that a group project activity is unsuitable due to part-time student working restrictions

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.
2	ICW	ICW		ICW	ICW
3	EX	EX		EX	
4	ICW	ICW		ICW	ICW
5	ICW	ICW		ICW	
6	GCW	GCW	GCW	GCW	GCW
7	ICW	ICW	ICW	ICW	
8	GCW	GCW	GCW	GCW	GCW
9	GCW	GCW	GCW	GCW	GCW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	
10a	GPRES GCW ICW IPRAC	GPRES GCW ICW IPRAC	GPRES GCW ICW IPRAC	GPRES GCW ICW IPRAC	GPRES GCW ICW IPRAC	GPRES GCW ICW IPRAC	
10b	ICW	ICW	ICW	ICW	ICW	ICW	

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	
11	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	THESIS IPRES	

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

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students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

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New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
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As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The intention of the course is to provide students with knowledge and understanding and associated transferrable skills to make a contribution to industry on graduation. Graduates will typically seek employment in IT users and vendors industries, consultancies or research institutions. Common starting roles are junior managers, business analyst, implementation consultant, project manager and PhD researcher. With time (quicker for those with more background experience) graduates progress to senior positions with significant responsibility for people, budgets and projects.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: April 2022

1. What is the course?

Course information

Course Title	MSc in Management and Leadership – September 2022
Course code	MSMMLPAC, MSMMLPTC, PDMMLPTC, PCMMLPTC
Academic Year	2022/23
Valid entry routes	MSc, PgDip
Additional exit routes	PgCert, PgDip
Mode of delivery	Part-time
Location(s)¹ of Study	Cranfield University; London (Grant Thornton Premises)
School(s)	School of Management
Theme	Leadership and Management
Centre	Management and Leadership (MML)
Course Director	Dr Robby Allen
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	Yes
Apprenticeship Standard the course is mapped to	Senior Leader (Degree) Level 7 Apprenticeship Standard – see Annex A and B
Is the Degree apprenticeship integrated or non-integrated?	Non-integrated
Is the Mastership offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	MSc – Part-time - maximum of 5 years PG Certificate – 3 years PG Diploma – 4 years
Course Start Month(s)	September 2022

Institutions delivering the course

This course is delivered by the School of Management where the research interests consist of a wide range of management functions.

All teaching and assessment is provided by the School of Management, at times in cooperation with other parts of the university or through external collaborators who have recognised teacher status (RTS). The principal external collaborator is Grant Thornton, one of the major professional service organizations in the UK. Some modules are taught at the premises of Grant Thornton in London. Grant Thornton's RTS staff also delivers some accounting teaching. In addition, Grant Thornton's accredited coaching will engage with the students and deliver individualized coaching sessions in close alignment with Cranfield and the Leading with Impact: Organizational Behaviour module

Cranfield University interacts with the following institutions and in the following ways:

- All students will undertake a consulting project, normally in an external organisation, presenting findings to senior managers from the organisation involved
- Each module will incorporate input from senior managers/practitioners where appropriate
- Some students undertake research and/or project work off campus, within organisations. In some cases this may take the form of a short term internship assessed by individual project.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

2. What are the aims of the course?

The Cranfield MML aims to provide a distinctive and collaborative learning experience centred on a process of intense, interactive classroom sessions where the combination of the professional experience of a diverse student cohort and the faculty's direct involvement with global businesses ensures graduates have a deep understanding of contemporary business issues and the capacity to assume active leadership roles. This experience is founded on the integration of five aims:

- To develop a group of influential future leaders who will make a significant impact on their organisations, industries and the wider community.
- To create an understanding as to how to develop leadership capabilities in self and others in order to meet modern societal and business challenges.
- To deliver a contemporary and comprehensive knowledge of core business functions enabling students to show leading-edge insights and knowledge to experts and non-experts in a variety of management areas.
- To create a strategic mindset capable of viewing organisations as consisting of functions and groups whose actions must be motivated and aligned to meet objectives.
- To generate the self-awareness and confidence to lead and/or operate effectively as a member of a team drawn from a diverse variety of cultures, business experiences and personalities.

This programme is intended for the following range of students:

- Early-career professionals who want a "real-world" business education which they can apply directly back to their workplace.
- Self-motivated managers who are keen to improve themselves, enhance their skills, knowledge and abilities, and become more effective leaders.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Post-graduate Certificate and Post-graduate Diploma in Management and Leadership

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Articulate a critical awareness of the global environment within which organisations operate and the socio-cultural, political, institutional, managerial, technical and ethical ambiguities and risks that this gives rise to.
- ILO 2. Demonstrate appropriate and flexible qualities of leadership. Critically evaluate their personal strengths, weaknesses and preferences when working with others or leading them.
- ILO 3. Exhibit a critical, conceptual understanding of the main areas of management and a systematic knowledge of the relevant literature.
- ILO 4. Critically analyse and creatively manage the career development of themselves and others.

B. Post-graduate Diploma in Management and Leadership

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Articulate a critical awareness of the global environment within which organisations operate and the socio-cultural, political, institutional, managerial, technical and ethical ambiguities and risks that this gives rise to.
- ILO 6. Build strong working relationships as leaders and team members. Demonstrate an ability to work effectively with colleagues through leadership and persuasive influencing skills.

C. Masters in Management and Leadership

In completing this course, and achieving the associated award, a diligent student would also be expected to:

- ILO 7. Engage and carry out an evidence-led management project and critically discuss and reflect on it in a substantial project report, developing justified recommendations and action plans.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Intensive classroom interaction combined with a high proportion of teamwork, group projects, business simulations and private study.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- being placed in a diverse learning team and supervised by a learning team tutor;
- being exposed to a range of psychometric tests and an assessment centre exercise;
- one-to-one coaching from professionals.
- peer coaching elements

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Post-graduate Certificate**

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0	0
Module 1	20
Any 40 credits from Modules 2 - 11	40
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0	0
Module 1 - 11	120
TOTAL:	120

Students are required to complete the End Point Assessment prior to transferring to the MSc. Please refer to the Senior Leader Level 7 Degree Apprenticeship in Annex A and KSB mapping document in Annex B for more information.

C. **MSc**

The accumulation of 200 credits through the assessment of taught modules and the work-based project report as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0	0
Module 1 - 12	130
Module 13 (attendance only)	
WORK-BASED PROJECT:	
THESIS	70
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria, which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September 2021 and are expected to complete the course within 26 months in total, allowing for the Strategic Business Proposal and End Point Assessment for Senior Leader Apprentices.

The MML programme comprises a number of residential phases and a work-based project phase. Students start with an orientation day at Cranfield and have one or two modules in their block weeks approximately every six weeks. After 11 modules Senior Leader Apprentices enter the EPA preparatory period starting with Gateway, and complete the Strategic Business Proposal before EPA. The work-based Thesis project follows EPA.

From Part I of their studies students engage in peer coaching which is complemented by professional coaching sessions in Part II. Throughout their MML degree students are in learning teams to support each other.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

7. **Course Level Assessment Strategy**⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem-solving skills.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module. For instance, modules - such as core modules in the areas of marketing, strategy, corporate sustainability, management consulting or operations management, or electives such as supply chain management or cross-cultural management - are supported by a number of formative tasks including group discussions, group exercises, case studies and oral presentations.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through the *Evidence-Based Management* module and meetings with their thesis supervisor.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules MML – September 2022

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0		MML-IND	SLA+ MSc Induction	Dr Robby Allen	6		0	Y	19/09/22	19/09/22	19/09/22		AO						
1		MML-LOB Occ K22	Leading with Impact: Organizational Behaviour	Dr Deirdre Anderson	32		20	N	19/09/22	19/09/22	20/04/23	40	ICW	100				06/07/23	
2		M-T/ECM Occ K22	Economics for Managers	Prof Catarina Figueira	16		10	Y	20/09/22	20/09/22	23/09/22	40	GCW	100				03/11/22	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
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													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3		MML/ LSO Occ K22	Leading Strategic Operations	Dr Abdelkader Aoufi	16		10	N	12/07/23	12/07/23	14/07/23	40	GCW	100				06/10/23	
4		M-T/ MMT Occ K22	Strategic Marketing	Prof Vasilis Theoharakis	16		10	N	28/11/22	28/11/22	30/11/22	40	ICW	100				11/01/23	
5		MXM/ ACT Occ K22	Accounting	Dr Matthias Nnadi	16		10	Y	13/02/23	13/02/23	17/04/23	40	EX	100				17/04/23	
6		M-T/ LCS Occ K22	Leading Corporate Sustainability	Dr Namita Shete	16		10	Y	15/02/23	15/02/23	16/02/23	40	ICW	100				30/03/23	
7		MML/ SML Occ K22	Strategic Management and Leadership	Dr Mehdi Safavi	16		10	N	18/04/23	18/04/23	21/04/23	40	GCW	100				09/06/23	
8		M-T/SCM Occ K23	Supply Chain Management	Dr Lorenzo Prativiera	16		10	Y	09/10/23	09/10/23	11/10/23	40	GCW	100				06/12/23	

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													Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
9		MML/ MACL Occ C22	Management Consulting	Dr Monica Franco Santos	16		10	N	30/11/22	30/11/22	14/07/23	40	GPRES	100				15/09/23	
10		MXM/P2M Occ K23	Programme and Project Management	Dr Stephen Carver	16		10	Y	11/10/23	11/10/23	13/10/23	40	GPRAC GCW	50 50				24/11/23	
11		M-T/ PML Occ C22	People Management and Leadership	Dr Mengyi Xu	16		10	Y	10/07/23	10/07/23	12/07/23	40	ICW	100				25/08/23	
12		MML/BSN Occ K23	Business Skills and Negotiations	Dr Robby Allen	16		10	N	12/02/24	12/02/24	15/02/24	40	ICW	100				28/03/24	
13		M-T/ EBMA Occ K23	Evidence-based Management	Dr Chibuzo Ejiogu	16		0	Y	12/02/24	12/02/24	15/02/24	N/A	AO	N/A				N/A	
14		MML/ THS Occ K23	Management and Leadership Thesis (Work-based project)	Dr Robby Allen	10		70	N	16/02/24	16/02/24	11/11/24	50	THESIS	100				11/11/24	

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Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-T/ECM	Economics for Managers	Management	Management; Management and Corporate Sustainability; Management and HRM; Management and Leadership
M-T/MMT	Strategic Marketing	Management	Management; Management and Corporate Sustainability; Management and Entrepreneurship; Management and HRM; Management and Leadership;
M-T/LCS	Leading Corporate Sustainability	Management	Management; Management and Corporate Sustainability; Management and HRM; Management and Leadership; Business and Strategic Leadership; Food Systems and Management; Environmental Management for Business; Global Environmental Change
M-T/SCM	Supply Chain Management	Management	Management; Management and Leadership
MXM/P2M	Programme and Project Management	Executive MBA	Executive MBA; Business and Strategic Leadership; Retail and Digital Banking; Management and Leadership
M-T/PML	People Management and Leadership	Management	Management; Management and HRM; Management and Leadership; Marketing and Leadership
M-T/EBM	Evidence-based Management	Management	Management; Management and Corporate Sustainability; Management and Entrepreneurship; Management and Leadership; Executive Logistics and Supply Chain Management
MXM/ACT	Accounting	Executive MBA	Management and Leadership

8. How are the ILOs assessed?

The programme uses a range of assessment types. In addition to closed book and open book written examinations, students undertake a wide range of projects. A more unusual type of assessment is the simulation. Here students – again working in teams – might be required to build a warehouse or an electrical product – within a limited period of time, where information may be given and/or changed at intervals. Many projects involve working with a company on a live project. Towards the end of the programme there will be the opportunity for some students to work on company based projects or short term internships, assessed through a written report.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Post-graduate Certificate and Post-graduate Diploma

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.
	Post-graduate Certificate					
	Post-graduate Diploma					
01		ICW	ICW	ICW		
02	GCW					
03	GCW		GCW		GCW	
04	ICW		ICW		ICW	
05			EX		EX	
06	ICW	ICW	ICW		ICW	ICW
07	GCW		GCW		GCW	GCW
08	GCW		GCW		GCW	
09	GPRES	GPRES	GPRES		GPRES	GPRES
10	GPRAC GCW	GPRAC GCW	GPRAC GCW		GPRAC	GPRAC GCW
11	ICW		ICW		ICW	

B. MSc

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.
01		ICW	ICW	ICW			
02	GCW						
03	GCW		GCW		GCW		
04	ICW		ICW		ICW		
05			EX		EX		
06	ICW	ICW	ICW		ICW	ICW	
07	GCW		GCW		GCW	GCW	
08	GCW		GCW		GCW		
09	GPRES	GPRES	GPRES		GPRES	GPRES	
10	GPRAC GCW	GPRAC GCW	GPRAC GCW		GPRAC	GPRAC GCW	
11	ICW		ICW		ICW		
12	ICW		ICW	ICW	ICW	ICW	
13 -14	THS		THS		THS	THS	THS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

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As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The list of opportunities available to our Masters students after graduating is extremely wide. Drawing on recent surveys of our graduates the most popular functions were as follows:

- General Management
- Engineering and R & D Management
- Consultancy
- Business Development
- Strategy
- Sales/Marketing
- Finance/Accounting
- Operations
- IT Project Management

In addition a small but growing number of students set-up their own businesses, though this number increases after two to three years post-graduation

Annex A – Senior Leader Apprenticeship (with Post-Graduate Diploma in Management and Leadership)

Senior Leader Apprenticeship+ Management and Leadership MSc (cranfield.ac.uk)

Our Senior Leader Apprenticeship+ Management and Leadership MSc programme has been designed in two parts, and is delivered in partnership with Grant Thornton. Part I provides a distinctive and collaborative learning experience, with intense and interactive classroom sessions. Students develop leadership and management capabilities enabling them to become reflective and evidence-based leaders of the future.

Students, subject to successful completion of the taught modules, are qualified to progress onto Part II, the Management and Leadership MSc, which enables them to cement their learning and complete a significant work-based project within their organisation.

Students will benefit from a diverse student cohort and our faculty's direct involvement with global businesses. On successful completion of Part I and Part II graduates will be awarded the Management and Leadership MSc and will have a deep understanding of contemporary business issues and a capacity to assume active leadership roles.

Senior Leader Apprenticeships (with Post-Graduate Diploma in Management and Leadership)

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0 Module 1 - 11	Module 0 120
Compulsory Gateway and End Point Assessment	
TOTAL:	120

The Level 7 Senior Leader Apprenticeship Standard does not have a mandatory qualification attached to it. The training programme for this apprenticeship is delivered through registration on the PgDip in Management and Leadership which is aligned with the relevant Knowledge, Skills and Behaviours (KSBs) as detailed in the apprenticeship standard (see Annex B). The Apprenticeship is successfully completed through passing the End Point Assessment (EPA) only. Apprentices who successfully complete the requirements of the PgDip in Management and Leadership as part of their apprenticeship training programme will receive that award from the University following the completion of their End Point Assessment. Following the culmination of the apprenticeship (through successful EPA completion, failure or withdrawal) apprentices who have not met the requirements for a PgDip may be awarded academic credit for any module successfully completed as part of their training programme, which may entitle them to a PgCert award in Management and Leadership

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: August 2022

1. What is the course?

Course information

Course Title	MSc in Manufacturing Technology and Management
Course code	MSMTMFTC, MSMTMPTC, PDMTMFTC, PDMTMPTC, PCMTMFTC, PCMTMPTC, MSMTMPAC
Academic Year	2022/23
Valid entry routes	MSc, PgDip, PgCert (PgDip and PgCert not available to apprenticeship students)
Additional exit routes	
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Surface Engineering and Precision Centre
Course Director	Dr Jeff Rao
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	Yes
Apprenticeship Standard the course is mapped to	Level 7 Materials Process Engineer
Is the Degree apprenticeship integrated or non-integrated?	Non-integrated
Is the Mastership offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	One year full-time, three years part-time
Course Start Month(s)	Full-time: September. Part-time: throughout the year. Apprenticeship: October

Institutions delivering the course

This course is delivered by the School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Surface Engineering and Precision Centre, where the research interests include:

Manufacturing Technology and Materials Engineering.
Enhanced Composites and Advanced Structures
Surface Engineering and Precision Engineering
Welding Engineering and Laser Processing
Through Life Engineering Services
Additive Manufacturing

This capability is complemented by the manufacturing management research undertaken through the Manufacturing Theme and the School of Management.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This MSc course is accredited by;

- The Institute of Materials, Minerals and Mining (IOM3) on behalf of the Engineering Council as further learning for CEng until August 2026
- The Institution of Engineering and Technology (IET) on behalf of the Engineering Council as further learning until August 2025,
- The Institution of Mechanical Engineers (IMechE) on behalf of the Engineering Council as further learning for CEng until August 2026,
- The Royal Aeronautical Society (RAeS) on behalf of the Engineering Council as further learning for CEng until August 2026.

Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- Prepare science and engineering graduates to meet the increasing demand of industry, consultancies and the public sector for manufacturing engineers in the aerospace, automotive, health technologies, energy, defense and consumer products sectors.
- Ensure manufacturing engineers acquire an advanced theoretical and specialist understanding of manufacturing technologies, the role of materials and the management of technology in these sectors.
- Enable manufacturing engineers to select and use appropriate technologies in different manufacturing sectors to minimise operational risks and maximise process reliability and capability based on the application of appropriate scientific, technical and engineering principles.

- Ensure manufacturing engineers develop the capacity to undertake successful research and innovation projects using appropriate methods of critical analysis.

This programme is intended for the following range of students:

- Graduates with science or related engineering degrees keen to pursue careers in manufacturing.
- Graduates currently in employment keen to extend their qualifications or to pursue a career change.
- Individuals with other qualifications but who possess considerable relevant experience.

3. **What should students expect to achieve in completing the course?**

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Describe the key concepts and issues relating to manufacturing processes, the enabling technologies, together with the engineering principles that underpin the design and operation of manufacturing systems.
- ILO 2. Describe of the influence of materials in manufacturing processes in terms of process reliability, operational risks and system efficiencies
- ILO 3. Analyse manufacturing technology challenges and design appropriate solutions taking account of environmental, technical, regulatory and commercial constraints
- ILO 4. Communicate effectively their work via oral and written presentations and reports.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Define, analyse and evaluate the complex interrelationships facing manufacturing engineers, addressing the design, the making, the testing and the validation of manufactured assemblies/components.
- ILO 6. Analyse critically the practical challenges facing the manufacturing sectors, having regard to technical, regulatory, commercial, political, social and environmental constraints.
- ILO 7. Undertake a research project on a subject relevant to technical, operational or commercial aspects manufacturing industries, comprising a review of relevant literature, methodological planning, data collection, data analysis, presentation of results, and evaluation and discussion of the results.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Undertake an independent research project, evaluating the available literature, identifying suitable research methodologies, data collection and analysis, drawing appropriate conclusions and the contributions made.

4. **How is the course taught?**

Students will be supported in their learning and personal development by:

- Comprehensive course materials are provided, as well as a website using the Virtual Learning Environment (VLE). Students are guided by exercises, group and individual discussion.

- Students engage in class activities to practice the techniques taught.
- Group working is encouraged with the core modules.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 and 3 Module 0	20 0
ELECTIVE MODULES:	
Four modules from modules 2, 4 and 5 - 15	40
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 1, 3 and 4 Module 0 Group Project (16a)	30 0 40
ELECTIVE MODULES:	
Five modules from modules 2, 19 and 5 - 15	50
TOTAL:	120

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 1, 3 and 4 Module 0	30 0
ELECTIVE MODULES:	
Five modules from modules 2, 19 and 5 – 15.	50
Group Project (16a) or Dissertation (16b)	40
TOTAL:	120

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 1, 3 and 4	30
Module 0	0
Group Project (16a)	40
Individual Research Project (17)	80
ELECTIVE MODULES:	
Five modules from modules 2, 19, and 5 - 15	50
TOTAL:	200

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 1, 3 and 4	30
Module 0	0
Individual Research Project (17)	80
ELECTIVE MODULES:	
Five modules from modules 2, 19 and 5 – 15.	50
Group Project (16a) or Dissertation (16b)	40
TOTAL:	200

APPRENTICESHIP STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 1, 3, 4, 6, 7, 11 and 18	80
Module 0	0
Dissertation for MPE (16c)	40
Individual Research Project (17)	80
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months. Modules are taught up until February after which the students undertake a group project for 12-weeks followed by a 16-week individual research project

The course also targets part-time candidates, and such students are expected to complete the course within 2 to 3 years. Part-time students are not restricted to starting in September. Instead they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend. For those on the apprenticeship route, the course starts in January each year running for 30 months. The apprentices are taught a manufacturing toolkit, a project 'sandpit' designed to support the toolkit learning, a best-practice case study and a dissertation to execute the learnings applied to your business sector

7. Course Level Assessment Strategy⁴

The assessment tasks are designed to enable students to apply and demonstrate a range of skills and attributes as summarized in the ILOs. The core modules form the heart of manufacturing technology and their understanding will be assessed through either assignments and exams. The choice of 5 elective modules allows the students to tailor their learning to their intended careers. Each module has its own assessment, which includes summative and formative, details of which are clearly stated within the module descriptor.

The introductory course (Introduction to Manufacturing and Research Techniques) is designed for students to get to know each other and work in teams. Students are given opportunities to develop their communication skills at an early stage, as they are required to give a group presentation and individual presentation. The ability to work effectively in groups is a highly desirable skill which has translated into ILOs 4 and 5. Feedback on their presentations are given immediately after the group presentations. Students will also engage with an interactive learning activity which incorporates formative feedback. This is exhibited in modules 3, 4, 5, 6, 7, 9 which are supported by a number of formative tasks including group

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

discussions, lab tours, seminars and oral presentations. Formative feedback is given verbally within the classroom following discussions and oral feedback provided by the tutor and peers after presentations. For modules 2, 3, 4, 5 peer review informs practice and tutorials guide progress, students are generally encouraged to support each other by asking and answering questions via the VLE. The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through modules 16, 17. The research project addresses ILO 8 and takes the form of a Thesis assessed via an oral poster presentation and a research thesis report.

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

September (Full-time + Part-time) Intake (Not applicable to Apprenticeship)

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
0	I-MAT-INWK	Introduction	Dr Sue Impey	39		0	Y	28/09/22	03/10/22	07/10/22	N/A	AO	N/A				N/A	
1	I-MTM-A2028	Introduction to Sustainable Manufacturing	Dr Kostas Georgarakis/Dr Jeff Rao	25		10	Y	07/11/22	07/11/22	11/11/22	50	ICW	100				05/12/22	Re-assessment date to be set by agreement of the Module Leader as/when required.

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
2	I-MAT-A1009	Introduction to Materials Engineering	Dr David Ayre	30		10	Y	10/10/22	10/10/22	14/10/22	50	ICW	100				07/11/22	Re-assessment date to be set by agreement of the Module Leader as/when required.
3	I-GPD-A1505	Lean Product Development	Dr Ahmed Al-Ashaab	32		10	Y	16/01/23	16/01/23	20/01/23	50	GCW	100				13/02/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
4	I-MNU-A1018	General Management	Dr Claudiu Giusca	32		10	Y	28/11/22	28/11/22	02/12/22	50	EX	100				06/01/23	Manufacturing resit exams will be during week commencing 15/05/23
5	I-MAT-A1013 Occ A	Composites Manufacturing for High Performance Structures	Mr Andrew Mills	30		10	Y	14/11/22	21/11/22	25/11/22	50	ICW	100				04/01/23	Re-assessment date to be set by agreement of the Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
6	I-MNU-A1034 Occ A	Operations Management	Dr Mohamed Shararah	32		10	Y	10/10/22	10/10/22	14/10/22	50	EX	100				12/12/22	Manufacturing resit exams will be during week 15/05/23
7	I-MNU-A1029 Occ A	Operations Analysis	Mr John Patsavellas	32		10	Y	31/10/22	31/10/22	04/11/22	50	EX	100				15/12/22	Manufacturing resit exams will be during week 15/05/23
8	I-WEE-A1110	Advanced Welding Processes	Dr Wojciech Suder	27		10	Y	21/11/22	21/11/22	25/11/22	50	EX	100				04/01/23	Manufacturing resit exams will be during week commencing 15/05/23
9	I-MAT-A1011	Additive and Subtractive Manufacturing Technologies	Dr Claudiu Giusca	30		10	Y	17/10/22	17/10/22	21/10/22	50	ICW	100				14/11/22	Re-assessment date to be set by agreement of the Module Leader as/when required.
10	I-MAT-A1016	Surface Science and Engineering	Prof John Nicholls	30		10	Y	23/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	Re-assessment date to be set by the Module Leader as/when required.
11	I-UPT-A1186	Materials Process Engineering	Dr Jeff Rao					This module is not available to students on non-Apprenticeship routes										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
12	N-MAM-FEAAM	Finite Element Analysis for Additive Manufacturing	Dr Yongle Sun	31		10	Y	05/12 /22	05/12/22	09/12/22	50	ICW	100				09/01/23	Re-assessment date to be set by the Module Leader as/when required.
13	N-AEN-M	Manufacturing	Dr Jafar Jamshidi	25		10	Y	31/10/ 22	31/10/22	04/11/22	50	ICW	100				03/01/23	Re-assessment date to be set by the Module Leader as/when required.
14	I-MTM-CRS	Composites Joining, Repair and Serviceability	Dr Sameer Rahatekar	30		10	N	05/12/ 22	05/12/22	09/12/22	50	ICW	100				16/01/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
15	I-MTM-NAC	Nanomaterials and Advanced Composites	Dr Sameer Rahatekar	30		10	N	17/10/ 22	17/10/22	21/10/22	50	ICW	100				14/11/22	Re-assessment date to be set by agreement of the Module Leader as/when required.
16a	I-MAT-GRPP	Group Project	Dr David Ayre	20		40	Y	30/01/ 23	30/01/23 Occ A FT	25/04/23 FT	50	GPR ES GCW ICW IPR AC	16 64 10 10				25/04/23 02/05/23 02/05/23 02/05/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			Dr David Ayre						06/02/23 Occ B PT	01/08/23 PT	50	GPR ES GCW ICW IPRA C	16 64 10 10				25/07/23 01/08/23 01/08/23 01/08/23	
16b	I-MAT-DISS	Dissertation for Part Time Students	Dr Sue Impey/Dr David Ayre	20		40	Y	06/02/23	06/02/23	25/08/23	50	ICW ICW	90 10				25/08/23 25/08/23	
16c	I-MPE-DISS	Dissertation for Materials Process Engineer	Dr Jeff Rao					This module is not available to students on non-Apprenticeship routes										
17	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan Dr Muhammad Khan	20		80	Y	06/02/23	Occ A = PT 06/02/23 Occ B = FT 28/04/23	PT 25/08/23 FT 25/08/23	50 50	THE SIS IPRE S I- THE SIS IPRE S	90 10 90 10				25/08/23 29/08/23 25/08/23 29/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRA – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
18	I-MTM-OMO	Optimisation of Manufacturing Operations	Dr Adnan Syed					This module is not available to students on non-Apprenticeship routes										
19	I-MTM-CME (new code)	Computational Materials Engineering	Dr Gustavo Castelluccio	32		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	Re-assessment date to be set by agreement of the Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Apprenticeship route ONLY.

January 2021 intake

Module Number	Module code	Title	Module Leader	Contact hours ¹²	Total hours delivered by Visiting Lecturers ¹³	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ¹⁴ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ¹⁵ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ¹⁸	Assessment / Exam Retake date
17	I-MNU-THESIS AY22-M22	Individual Research Project	Dr Muhammad Khan	20		80	Y	01/08/22	01/08/22	05/12/22	50	THESIS IPRES	90 10				02/12/22 05/12/22	

¹² Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

¹³ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

¹⁴ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

¹⁵ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

¹⁶ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁷ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁸ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

January 2022 intake

Module Number	Module code	Title	Module Leader	Contact hours ¹⁹	Total hours delivered by Visiting ²⁰	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²¹ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ²² (%) of Independent assessments	Weighting within module of multi-part assessments ^{23/24}	Type of Assessment	Weighting of individual elements of multi-part assessment ²⁴	Assessment Submission and/or exam date ²⁵	Assessment / Exam Retake date
18	I-MTM-OMO-21-B21	Optimisation of Manufacturing Operations	Dr Adnan Syed	23		20	N	25/05/22	01/06/22	12/12/22	50	ICW	100				12/12/22	Re-assessment date set by Module Leader as/when required.
7	I-MNU-A1029-22-A22	Operations Analysis	Mr John Patsavellas	32		10	Y	31/10/22	31/10/22	04/11/22	50	EX	100				16/12/22	Resit exams dates will be advised accordingly
3	I-ECP-PD-22-A22	Lean Product Development (EC)	Dr Ahmed Al-Ashaab	32		10	Y	23/01/23	30/01/23	02/02/23	50	GCW	100				13/03/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
11	I-UPT-A1186-22-A22	Materials Process Engineering	Dr Jeff Rao	32		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	Re-assessment date set by Module

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6 Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

7 A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

8 For **independent assessments** please record type and weighting of each separate piece of assessment individually.

9 For **multi-part assessments** please record the overall weighting of module which should be 100%.

10 Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

11 Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ¹⁹	Total hours delivered by Visiting ²⁰	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²¹ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ²² (%) of Independent assessments	Weighting within module of multi-part assessments ^{23/4000/1}	Type of Assessment	Weighting of individual elements of multi-part assessment ²⁴	Assessment Submission and/or exam date ²⁵	Assessment / Exam Retake date
																	Leader as/when required.	
16c	I-MPE-DISS -22-A22	Dissertation for Materials Process Engineer	Dr Jeff Rao	20		40	N	01/03/23	01/03/23	30/06/23	50	ICW	100				30/06/23	
17	I-MNU-THESIS – 22-J22	Individual Research Project	Dr Muhammad Khan	20		80	Y	02/05/23	02/05/23	04/12/23	50	THE SIS IPRES	90 10				01/12/23 04/12/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

October 2022 intake

Module Number	Module code	Title	Module Leader	Contact hours ²⁶	Total hours delivered by Visiting Lecturers ²⁷	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ²⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ³²	Assessment / Exam Retake date	
0	I-MAT-INWK	Introduction	Dr Sue Impey	39		0	Y	28/09/22	03/10/22	07/10/22	N/A	AO	N/A				N/A		
1	I-MTM-A2028 A22 Occ B	Introduction to Sustainable Manufacturing	/Dr Kostas Georgarakis/Dr Jeff Rao	25		10	Y	28/11/22	28/11/22	02/12/22	50	ICW	100				20/01/23	Re-assessment date to be set by agreement of the Module Leader as/when required.	

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²⁷ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

²⁸ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

²⁹ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

³⁰ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

³¹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

³² Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ²⁶	Total hours delivered by Visiting Lecturers ²⁷	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ²⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ³²	Assessment / Exam Retake date	
2	I-MAT-A1009	Introduction to Materials Engineering	Dr David Ayre						This module is not available to students on the Apprenticeship route										
3	I-ECP-PD Occ A	Lean Product Development	Dr Ahmed Al-Ashaab	32		10	Y	30/01/23	30/01/23	03/02/23	50	GCW	100				13/03/23	Re-assessment date to be set by agreement of the Module Leader as/when required.	
4	I-ECP-GM Occ A	General Management	Dr Claudiu Giusca	32		10	Y	15/05/23	15/05/23	18/05/23	50	ICW	100				04/07/23	Re-assessment date to be set by agreement of the Module Leader as/when required.	
5	I-MAT-A1013 Occ A	Composites Manufacturing for High Performance Structures	Mr Andrew Mills						This module is not available to students on the Apprenticeship route										
6	I-MNU-A1034 Occ A	Operations Management	Dr Mohamed Shararah	32		10	Y	10/10/22	10/10/22	14/10/22	50	EX	100				12/12/22	Resit exams dates will be advised accordingly	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ²⁶	Total hours delivered by Visiting Lecturers ²⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ²⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ³²	Assessment / Exam Retake date
7	I-MNU-A1029 Occ A	Operations Analysis	Mr John Patsavellas	32		10	Y	31/10/22	31/10/22	04/11/22	50	EX	100				16/12/22	Resit exams dates will be advised accordingly
8	I-WEE-A1110	Advanced Welding Processes	Dr Wojciech Suder					This module is not available to students on the Apprenticeship route										
9	I-MAT-A1011	Additive and Subtractive Manufacturing Technologies	Dr Claudiu Giusca					This module is not available to students on the Apprenticeship route										
10	I-MAT-A1016	Surface Science and Engineering	Prof John Nicholls					This module is not available to students on the Apprenticeship route										
11	I-UPT-A1186-22-A22	Materials Process Engineering	Dr Jeff Rao	32		10	N	23/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	Re-assessment date to be set by agreement of the Module Leader as/when required..
12	N-MAM-FEAA M	Finite Element Analysis for Additive Manufacturing	Dr Muhammad Khan/					This module is not available to students on the Apprenticeship route										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ²⁶	Total hours delivered by Visiting Lecturers ²⁷	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ²⁹ (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date ³²	Assessment / Exam Retake date	
13	N-AEN-M	Manufacturing	Dr Jafar Jamshidi					This module is not available to students on the Apprenticeship route											
14	I-MTM-CRS	Composites Joining, Repair and Serviceability	Dr Sameer Rahatekar					This module is not available to students on the Apprenticeship route											
15	I-MTM-NAC	Nanomaterials and Advanced Composites	Dr Sameer Rahatekar					This module is not available to students on the Apprenticeship route											
16a	I-MAT-GRPP	Group Project	Dr David Ayre					This module is not available to students on the Apprenticeship route											
16b	I-MAT-DISS	Dissertation for Part Time Students	Dr Sue Impey/Dr David Ayre					This module is not available to students on the Apprenticeship route											
16c	I-MPE-DISS A23	Dissertation for Materials Process Engineer	Dr Jeff Rao	20		40	N	18/09/23	18/09/23	19/02/24	50	ICW	100				19/02/24		
17	I-MNU-THESIS Occ A23	Individual Research Project	Dr Muhammad Khan	20		80	Y	26/02/24	26/02/24	10/09/24	50	THESIS IPRES	90 10				10/09/24 13/09/24		
18	I-MTM-OMO	Optimisation of Manufacturing Operations	Dr Adnan Syed	23		20	N	20/02/23	27/02/23	31/07/23	50	ICW	100				31/07/23	Re-assessment date to be	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ²⁶	Total hours delivered by Visiting Lecturers ²⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ²⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
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																	set by agreement of the Module Leader as/when required.	
19	I-MTM-CME	Computational Materials Engineering	Dr Gustavo Castelluccio					This module is not available to students on Apprenticeship routes										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
<u>I-MAT-INWK</u>	<u>Introduction</u>	<u>Advanced Materials</u>	Engineering & Management of Manufacturing Systems, Aerospace Manufacturing, Global Product Development and Management, Maintenance Engineering and Asset Management, Advanced Materials, Aerospace Materials, Welding Engineering, Metal Additive Manufacturing, Management and Information Systems
I-MAT-A1011	Additive and Subtractive Manufacturing Technologies	<u>Advanced Materials</u>	Advanced materials Aerospace Manufacturing
I-MTM-A2028	Introduction to Sustainable Manufacturing	Manufacturing Technology and Management	EngD in Sustainable Manufacturing Systems,
I-MAT-A1009	Introduction to Materials Engineering	Advanced Materials	Aerospace Materials,
I-GPD-A1505	Lean Product Development	Global Product Development and Management	Water - WIRE
I-ECP-PD	Lean Product Development	Engineering Competence	
I-ECP-GM	General Management	Engineering Competence	
I-MNU-A1018	General Management	Manufacturing Technology and Management	Global Product Development and Management, Advanced Materials,
I-MAT-A1013	Composites Manufacturing for High Performance Structures	Advanced Materials	Aerospace Manufacturing, Aerospace Materials, Renewable Energy Marine Structures EngD
N-AEN-M	Manufacturing	Aircraft Engineering	Airworthiness
I-MAT-A1016	Surface Science and Engineering	Advanced Materials	Aerospace Materials,
N-MAM-FEAAM	Finite Element Analysis for metal additive Manufacturing	Metal Additive Manufacturing	Metal Additive Manufacturing
I-WEE-A1110	Advanced Welding Processing	Welding Engineering	Aerospace Manufacturing, Renewable Energy Marine Structures EngD
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Metal Additive Manufacturing

I-MNU-A1029	Operations Analysis	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing,
I-MAT-GRPP	Group Project	Advanced Materials	Aerospace Materials, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management
I-MAT-DISS	Dissertation for Part Time Students	Advanced Materials	Aerospace Materials, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Aerospace Materials, Welding Engineering, Metal Additive Manufacturing, Advanced Materials, Maintenance Engineering and Asset Management

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have typically 3 written examinations, 5 pieces of assessment by submitted work and several elements of assessment by presentation or viva.

This approach has been adopted in order to ensure that both the fundamental and applied aspects of the course are considered and that the important multi-disciplinary aspects of the subject can be assessed.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

NON-APPRENTICESHIP ROUTE

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO4
1	ICW	ICW	ICW	ICW
2	ICW		ICW	ICW
3	GCW	GCW	GCW	GCW
4			EX	EX
5	ICW	ICW	ICW	ICW
6		EX	EX	
7	EX		EX	
8	EX	EX	EX	
9	ICW	ICW	ICW	ICW
10	ICW	ICW	ICW	ICW
11	not applicable on non-Apprenticeship route			
12	ICW	ICW	ICW	ICW
13	ICW	ICW		ICW
14	ICW	ICW	ICW	ICW
15	ICW		ICW	ICW
19	ICW			

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 5	ILO 6	ILO 7
16a	GPRES GCW	GPRES GCW	GPRES GCW
16b	ICW	ICW	ICW
19	ICW		

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 8
17	THESIS IPRES

APPRENTICESHIP ROUTE

A. MSc

The Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8
1	ICW	ICW	ICW	ICW				
3	GCW	GCW	GCW	GCW				
4			ICW	ICW				
6		EX	EX					
7	EX		EX					
11	ICW	ICW	ICW	ICW				
16c					ICW	ICW	ICW	
17								THESIS IPRES
18					ICW	ICW		

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The Government's manufacturing strategy is focused on high value manufacturing and central to this agenda is the development and application of disruptive technologies that will drive forward the dramatic changes in manufacturing that will take place over the next 15-20 years. This relies on a significant number of highly trained manufacturing engineers who will be essential to provide the leadership necessary to drive UK high value manufacturing forward and provide the vision for future prosperity. The MSc in Manufacturing Technology and Management is designed to educate manufacturing engineers to ensure they possess the skills needed for the high value manufacturing agenda. These engineers will be working in either of the following areas of manufacturing, design, make, test or validation. Having a

broader awareness of each of these areas is necessary to deliver well-rounded manufacturing engineers working in their respective specialist fields.

The rapid developments in manufacturing technology also dictate those sections of the current workforce will require re-skilling and therefore a significant number of part time students should be attracted to this course whilst remaining in employment.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: August 2020 / March 2021

1. What is the course?

Course information

Course Title	Marketing and Leadership
Course code	MSMKLPACD, MSMKLPTCD, PDMKLPAC
Academic Year	2022/2023
Valid entry routes	MSc, PGDip
Additional exit routes	PGDip. PGCert
Mode of delivery	Part-time
Location(s)¹ of Study	Cranfield, CIM
School(s)	School of Management
Theme	Leadership and Management
Centre	Centre for Strategic Marketing and Sales
Course Director	Vasilis Theoharakis
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	Yes
Apprenticeship Standard the course is mapped to	Senior Leader Level 7 Apprenticeship Standard - see Annex A and B
Is the Degree apprenticeship integrated or non-integrated?	Non-integrated
Is the Mastership offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University Entry Requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Part-Time - up to 5 years for Masters.
Course Start Month(s)	January

Institutions delivering the course

This course is delivered by the School of Management, Centre for Strategic Marketing and Sales where the research interests include:

Marketing and Sales

Cranfield University interacts with the following institutions and in the following ways:

All students will engage in assignments based on external organisations. All students will undertake an Independent Work-based Project as part of their programme. All students will engage in an End Point Assessment as part of their Apprenticeship Levy requirements. There will be a self-funded pathway available to non-Levy students.

Cranfield University has no delivery partners for this programme.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

The Cranfield Master of Marketing and Leadership aims to provide a distinctive and collaborative learning experience centred on a process of intense, interactive classroom sessions where the combination of the professional experience of a diverse student cohort and the faculty's direct involvement with global businesses ensures graduates have a deep understanding of contemporary business issues and the capacity to assume active leadership roles, particularly within the marketing domain. This experience is founded on the integration of five aims:

1. To develop a group of influential future marketing leaders who will make a significant impact on their organisations, industries and the wider community.
2. To create an understanding as to how to develop marketing and leadership capabilities in self and others in order to meet modern societal and business challenges.
3. To deliver a contemporary and comprehensive knowledge of core business functions enabling students to show leading-edge insights and knowledge to experts and non-experts in a variety of management areas.
4. To create a strategic mindset capable of viewing organisations as consisting of functions and groups whose actions must be motivated and aligned to meet objectives.
5. To generate the self-awareness and confidence to lead and/or operate effectively as a member of a team drawn from a diverse variety of cultures, business experiences and personalities.

Marketing strategy is embedded in the modules, which are structured to build from market sensing, designing the response to customer need, through to aligning to the market and customers' needs, through to implementation for growth and innovation. This provides graduates with the relevant leadership and critical thinking skills required for marketing leadership roles in the modern organisation.

The Master of Marketing and Leadership has been designed to accommodate the requirements of the Level 7 Senior Leader's Master's Degree Apprenticeship so that it is eligible for funding under the UK Apprenticeship Levy scheme, thus allowing employers to sponsor students on the programme in this way. This means it combines topic areas that are marketing-specific with those that aim to develop leadership skills and capabilities.

This programme is intended for the following range of students:

- Early-career professionals, typically with between three- and ten-years' work experience who want a "real-world" business education that can propel them into senior marketing-related roles.
- Self-motivated managers who are keen to improve themselves, enhance their skills, knowledge and abilities, and become more effective leaders.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Marketing and Leadership

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Appraise the global, local and internal environments that affect an organisation's ability to conduct its business
- ILO 2. Appraise the Strategic implications of marketing initiatives
- ILO 3. Evaluate the relationship between marketing and the other functions of an organisation.

B. Postgraduate Diploma in Marketing and Leadership

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 4. Evaluate their personal strengths, weaknesses and preferences when working with others or leading them
- ILO 5. Evaluate and recommend an appropriate range of marketing tools and techniques that apply to a real-world situation to address complex market and customer centric problems

C. MSc Marketing and Leadership

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Design a comprehensive plan that includes a recommended course of action to address a significant marketing-related problem

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Intensive classroom interaction combined with a high proportion of team work, group projects, business simulations and private study.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- being placed in a diverse learning team and supervised by a learning team tutor; and
- being exposed to a range of psychometric tests and an assessment centre exercise;

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Any 60 credits from Modules 1-11	60
ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Any 120 credits from Modules 1-11	120
ELECTIVE MODULES:	
N/A	
TOTAL:	120

Students are required to complete the End Point Assessment prior to transferring to the MSc. Please refer to the Senior Leader Level 7 Degree Apprenticeship in Annex A and KSB mapping document in Annex B for more information.

C. **MSc**

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
1-11 Thesis	130 70
ELECTIVE MODULES:	
N/A	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Students register for the course in September and are expected to complete the MSc within 27 months, allowing for the End Point Assessment for Senior Leader Apprentices.

The course has a structured timetable with one entry date to enable induction. If modules/assessments are deferred they will be completed at the next timetabled opportunity.

7. Course Level Assessment Strategy⁴

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem-solving skills.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes. Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams. This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but we strive to be always within 20 working days.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during the module. For instance, modules - such as core modules in the areas of marketing, strategy, corporate sustainability, management consulting or operations management, or electives such as supply chain management or cross-cultural management - are supported by a number of formative tasks including group discussions, group exercises, case studies and oral presentations.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during the research project and guidance will be provided through meetings with their thesis supervisor.

Course modules – M occurrence

The following modules outline all parts of the programme leading to MSc Marketing and Leadership. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	MKL-OBL-M22	Organisational Behaviour for Leaders	Dr Dierdre Anderson	32		20	Y	17/01/23	17/01/23	15/09/23	40%	ICW	100				1011/23	
2	MKL-UMC-M22	Understanding Markets and Competitors	Dr Annmarie Hanlon	16	0	10	N	17/01/23	17/01/23	20/01/23	40%	GCW ICW	40				17/03/23	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	MKL-UCU-M22	Understanding Customers	Dr Dennis Esch	16	0	10	N	29/03/23	29/03/23	30/03/23	40%		60				04/05/23	
4	MKL-GIN-M22	Growth and Innovation	Prof Vasilis Theoharakis	16	0	10	N	29/03/23	29/03/23	30/03/23	40%	GCW ICW	40 60				09/06/23 19/07/23	
5	MKL-VAP-V22	Value Propositions	Dr Dennis Esch	16	16	10	N	12/06/23	12/06/23	13/06/23								
6	MKL-CDC-M23	Customer Relationships and Delivery Channels	Javier Marcos-Cuevas	16	0	10	N	12/09/2023	12/09/2023	15/09/2023	40%	GCW ICW	40 60				13/10/23 12/12/23	
7	MKL-MCO-M23	Marketing Communications	Dr Marwa Tourky	16	0	10	N	13/11/23	13/11/23	14/11/23								
8	M-L-ACF-J22	Accounting and Finance	Sanjay Lanka	16	0	10	Y	14/06/23	14/06/23	15/06/23	40%	EX	100				11/09/23	
9	MKL-EME-M23	Evaluating Marketing Effectiveness	Prof Vasilis Theoharakis	16	0	10	N	11/03/24	11/03/24	12/03/24	40%	ICW	100				19/04/24	
10	M-T-PML-M23	People Management and Leadership	Dr Mengyi Xu	16		10	Y	15/11/23	15/11/23	16/11/23	40%	ICW	100				11/01/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11	MKL-LCH-M23	Leading Change	Prof Vasilis Theoharakis	26		20	N	08/01/24	08/01/24	10/01/24	40%	ICW	100				14/02/24	
12	MKL-THS-M23	Marketing and Leadership Thesis	Dr Ian Crawford	10		70	N	03/07/2024	03/07/2024	04/07/2024	50% 50%	THESIS ICW	85 15				25/01/25 22/06/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L-ACF	Accounting and Finance	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Management; Management and Entrepreneurship; Management and Corporate Sustainability; Exec Logistics and Supply Chain Management; Marketing and Leadership
M-T-PML	People Management and Leadership	Management	Management and Corporate Sustainability; Management and Leadership; Marketing and Leadership
MML-LOB	Leading with Impact: Organisational Behaviour	Management and Leadership	Marketing and Leadership

8. How are the ILOs assessed?

The following assessment types are utilised:

ILOs are assessed through a combination of individual essays, group-based reports, formative feedback and through individual examinations.

This approach has been adopted because:

It offers a wide variety of methods to assess learning outcomes that facilitate diverse learning styles and preferences.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

The Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6
	PgCert			PgDip		MSc
1.		ICW	ICW			
2	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	
3						
4	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	
5						
6	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	Integrated ICW, GCW	
7						
8	Ex	Ex	Ex			

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6
9	ICW	ICW	ICW	ICW	ICW	
10			ICW	ICW		
11	GCW, ICW	GCW, ICW	GCW, ICW			
12						Thesis

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
Group – Formative assessments of marketing research case analysis, summative presentation and report Individual – marketing analytics applications assignment	1. Understanding Markets and Competitors 2. Understanding Customers	GCW	40%
		ICW	60%
Group – marketing strategy simulation, presentation and report Individual – case analysis and value proposition development assignment	1. Growth and Innovation 2. Value Propositions	GCW	40%
		ICW	60%
Group – Marketing Communications plan Individual – CRM analysis and plan	1. Customer Relationships and Delivery Channels 2. Marketing Communications	GCW	40%
		ICW	60%

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The purpose of this course is to develop aspiring marketing leaders. Graduates can expect to take on senior marketing roles in a variety of different organisations.

Annex A – Senior Leader Apprenticeship (with Post-Graduate Diploma in Marketing and Leadership)

Senior Leader Apprenticeship+ Marketing and Leadership MSc (cranfield.ac.uk)

Our Senior Leader Apprenticeship+ Marketing and Leadership MSc programme has been designed in two parts. Part I enables students to gain an understanding of both general management functions, including strategy, finance, corporate sustainability and change management, and specialist and advanced subjects related to strategic marketing, including strategic marketing planning, customer management, digital marketing, communications, and consumer behaviour.

Students, subject to successful completion of the taught modules, are qualified to progress onto Part II, the Marketing and Leadership MSc, which enables them to cement their learning and complete a significant work-based project within their organisation.

This programme develops students' marketing and leadership skills, enabling them to lead change and meet the constantly evolving needs and requirements of customers. Students gain leading-edge insights into marketing and leadership that can then be applied directly within their organisation.

Senior Leader Apprenticeships (with Post-Graduate Diploma in Marketing and Leadership)

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1 - 11	120
Compulsory Gateway and End Point Assessment	
Subject to successful completion of the taught modules, students are qualified to progress onto Part II of the course	
TOTAL:	120

The Level 7 Senior Leader Apprenticeship Standard does not have a mandatory qualification attached to it. The training programme for this apprenticeship is delivered through registration on the PgDip in Marketing and Leadership which is aligned with the relevant Knowledge, Skills and Behaviours (KSBs) as detailed in the apprenticeship standard (see Annex B). The Apprenticeship is successfully completed through passing the End Point Assessment (EPA) only. Apprentices who successfully complete the requirements of the PgDip in Marketing and Leadership as part of their apprenticeship training programme will receive that award from the University following the completion of their End Point Assessment. Following the culmination of the apprenticeship (through successful EPA completion, failure or withdrawal) apprentices who have not met the requirements for a PgDip may be awarded academic credit for any module successfully completed as part of their training programme, which may entitle them to a PgCert award in Marketing and Leadership

Annex A: Senior Leader Level 7 Degree Apprenticeship – Marketing and Leadership – Link to Senior Leader EPA Plan IFATE

Modules	Knowledge																				Skills																					Behaviours									
	K 1	K 2	K 3	K 4	K 5	K 6	K 7	K 8	K 9	K 1 0	K 1 1	K 1 2	K 1 3	K 1 4	K 1 5	K 1 6	K 1 7	K 1 8	K 1 9	K 2 0	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 1 0	S 1 1	S 1 2	S 1 3	S 1 4	S 1 5	S 1 6	S 1 7	S 1 8	S 1 9	S 2 0	S 2 1	B 1	B 2	B 3	B 4	B 5					
Leading with Impact: Organisational Behaviour	X									X	X	X												X										X	X	X	X		X	X	X	X	X	X	X	X	X	X			
Understanding Markets and Competitors	X	X	X	X			X						X	X							X	X	X										X											X	X	X	X	X	X		
Understanding Customers		X	X			X	X						X	X		X					X	X	X										X											X	X	X	X	X	X		
Growth and Innovation	X	X	X	X	X		X			X	X		X	X	X	X				X	X	X	X	X	X	X	X	X		X	X		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Value Propositions	X	X	X	X			X					X	X	X	X	X				X	X	X	X	X			X	X		X			X								X	X	X	X	X	X	X	X	X	X	
Customer Relationships and Delivery Channels		X	X	X	X		X			X		X	X	X	X	X					X	X	X	X	X	X	X			X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Marketing Communications		X	X	X			X			X			X	X	X	X				X	X	X	X	X		X	X			X			X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Accounting and Finance						X		X	X																				X	X	X	X												X	X	X	X	X	X		
Evaluating Marketing Effectiveness	X	X	X	X	X	X	X	X	X			X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
People Management and Leadership				X			X			X	X							X		X				X					X				X	X	X	X	X	X	X	X	X	X	X	X					X		
Enterprise, Performance and Risk Management		X		X		X	X	X	X	X			X	X			X				X	X		X	X	X	X	X	X	X	X		X		X	X	X	X					X	X	X	X	X	X	X		
Marketing and Leadership Thesis																																																			

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: April 2022

A. What is the course?

Course information

Course Title	Master of Business Administration Master of Business Administration (Energy)
Course code	MBFTMFTC, (Chilean Route: MBACHLF)
Academic Year	2022-2023
Valid entry routes	MBA
Additional exit routes	PgCert in Business Administration PgDip in Business Administration
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Management
Theme	Leadership and Management
Centre	Centre for Management
Course Director	Dr Leila Alinaghian
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	No
Is the Degree apprenticeship integrated or non-integrated?	No
Is the Mastership offered as an open and/or closed course?	N/A

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	<ul style="list-style-type: none"> • A minimum of three years' post-qualification work experience. • A good degree and / or professional qualification. • Applicants who do not have a degree are welcomed provided they can demonstrate high levels of achievement, exceptional career progression or evidence of leadership potential. <p>If you are an international student you will need to provide evidence that you have achieved a satisfactory test result in an English qualification. The minimum standard expected from a number of accepted courses are as follows: IELTS – 7, TOEFL – 100, Pearson PTE Academic- 68, Cambridge English Scale – 190, Cambridge English: Advanced – A, Cambridge English: Proficiency – B.</p>
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	1 year
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by the School of Management where the research interests consist of a wide range of management functions.

Cranfield University interacts with the following institutions and in the following ways:

- All students will undertake a group consulting project in an external organisation, presenting findings to senior managers from the organisation involved
- Each module will incorporate input from senior managers/practitioners where appropriate
- Some of the modules require learning teams to visit an organisation to audit their approach
- some students undertake research and/or project work off campus, within organisations. In some cases this will take the form of a short term internship, again assessed by project submission;

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Association to Advance Collegiate Schools of Business (AACSB) and the Association of MBAs (AMBA). It is also accredited by the European Quality Improvement System (EQUIS).

B. What are the aims of the course?

The Cranfield MBA aims to provide a distinctive and collaborative learning experience centred on a process of intense, interactive classroom sessions where the combination of the professional experience of a diverse student cohort and the faculty's direct involvement with global businesses ensures graduates have a deep understanding of

contemporary business issues and the capacity to assume active leadership roles. This experience is founded on the integration of four aims:

- To develop a group of influential leaders who will make a significant impact on their organisations and the wider community.
- To deliver a contemporary and comprehensive knowledge of core business functions enabling students to talk knowledgeably to experts in these areas.
- To create a strategic mind set capable of viewing organisations as consisting of functions and groups whose actions must be motivated and aligned to meet objectives.
- To generate the self-awareness and confidence to operate effectively as a member of and/or leader of a team drawn from a variety of cultures, business experience and personalities.
- To create an understanding as to how to develop leadership capabilities in self and others to meet the increasing challenge of change.

This programme is intended for the following range of students:

Experienced professionals who want a "real-world" business education which they can apply directly back to the workplace. Self-motivated managers both from profit and non-for profit organisations who are keen to improve themselves, enhance their skills, knowledge and abilities, and become more effective leaders. Energetic entrepreneurs who want to start a new business or grow their existing business.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. MBA

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- ILO 1. Demonstrate robust yet flexible qualities of leadership and an understanding of a wide range of management techniques.
- ILO 2. Exhibit a conceptual understanding of the main functional areas of management and a systematic knowledge of the relevant literature.
- ILO 3. How a thorough understanding of the importance of strategy, cross-function working and managing core business processes.
- ILO 4. Articulate a critical awareness of the global environment within which organisations operate and the cultural, political, managerial and ethical ambiguities and risks that this gives rise to.
- ILO 5. Display the capability to identify, analyse and implement appropriate conclusions for complex problems in the context of uncertainty and change.
- ILO 6. Critically evaluate their personal strengths, weaknesses and preferences.
- ILO 7. Present confidence in working with others and an ability to argue and present coherently and persuasively influence.
- ILO 8. Develop an ability to work with peers in order to create and implement effective strategies.
- ILO 9. Demonstrate robust qualities of leadership.
- ILO 10. Deal with challenging individuals and situations effectively.
- ILO 11. Understand how to manage their career development.

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4. How is the course taught?

The programme is delivered through classroom interaction combined with a high proportion of team work, group projects and private study.

Students will be supported in their learning and personal development by:

- being placed in a diverse learning team and supervised by a learning team tutor;
- being exposed to a range of psychometric tests and an assessment centre exercise;
- One to one coaching from professionals.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

MBA

An MBA will be awarded on successful completion of 240 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Module 1, 15	40
Modules 2-12	110
Modules 13-14, 16	30
ELECTIVE MODULES:	
60 credits from Modules 17-37	60
TOTAL:	240

A. MBA (Energy) – Not running in 2022/23

Description	Credits
COMPULSORY MODULES:	
Module 1, 15	40
Modules 2-12	110
Modules 13-14, 16	30
Modules 38-43	60
TOTAL:	240

B. MBA (Chilean Collaboration)

Description	Credits
COMPULSORY MODULES:	
Credits awarded for University of Chile (APL) Modules 8-14, 15a-16, 34	80 100
ELECTIVE MODULES:	
60 credits from Modules 17-33, 35-42	60
TOTAL:	240

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

This section outlines the rules observed by the board of examiners in determining whether you qualify for an award of the University.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$
- An overall average mark of $\geq 50\%$ across the taught assessments
- Completion of all assessments with the minimum mark attained: no more than one failure to complete an assessment (as defined in [Section 2.3](#)) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits (up to 60 learning credits for MBA students)**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits (or 60 learning credits for MBA students), you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);

In all cases, the average mark is calculated by taking into account the relative weighting of the associated learning credits, and the proportionality of individual assessments within a module as outlined in the course specification. Overall award marks are recorded to one decimal place and are not rounded up or down.

MBA (Energy) - The pass criterion for the MBA (Energy) is the same as the MBA above except that MBA (Energy) students have to select modules 38 to 43.

MBA (Chilean Collaboration) The pass criteria is the same as for the MBA; however a student will be regarded as having failed if he/she achieves a mark of less than 50 per cent on more than 20 credits. The Chilean students join at the start of Term 2 and are awarded 80 credits for prior learning providing they pass their Masters in Global Management programme at the University of Chile (UoC). In order to meet these criteria the students must return to the UoC, when they finish their Cranfield MBA studies.

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 13 calendar months.

The MBA programme is in two parts. Part I lasts for six months on the full-time programme and consists of compulsory modules designed to provide students with a contemporary understanding of basic business functions e.g., accounting and marketing. Part I is spread over terms 1 and 2. In Part II, which is spread over terms 3 and 4, full-time MBA students gain discretion over their learning by choosing from a range of electives, the subjects they believe will be most beneficial to their learning and future careers.

Throughout the whole programme i.e., Part I and II, the Developing Leadership theme is emphasised through four compulsory modules dealing with self-awareness, leadership skills and contemporary leadership challenges. In term 3, students are also completing their Data Analytics and Decision Making module, which runs throughout the Part I and II and includes classes on qualitative and quantitative research methods before they have to apply this to a real world consulting project. Moreover, at the end of term 3 students join together for the International Business Assignment. During this period students choose a traditional “study tour” consisting of a visit to a business school and companies in a country chosen from a short-list, or field trips where small groups of students work with small companies or charities in a different culture.

7. Course Level Assessment Strategy³

The aim of the course is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience. This approach has been adopted to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes, as described in module and course intended learning outcomes. Summative assessment will include a range of assessment types including the preparation of individual and group reports, oral presentations and written exams.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task will usually be stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days.

Many modules such as Economics of Organisations and Strategy, Strategic Management and Project Management Introduction are supported by a number of formative tasks including group discussion, case studies and oral presentations. Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session.

³ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>
Quality Assurance and Enhancement V1.1 March 2020

Course modules – FT MBA ‘A’ occurrences unless specified

The following modules outline all parts of the programme leading to **MBA**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lectures ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
1		M-M/OBL	Organisational Behaviour: Developing Leadership	Dr Richard Kwiatkowski	40		20	N	03/10/22	03/10/22	22/11/22	50	I PROJ	100				06/12/22	
2		M-M/ACC	Accounting	Dr Matthias Nnadi	20		10	N	14/11/22	14/11/22	07/12/22	50	EX	100				13/12/22	

⁴ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁵ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁶ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁷ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁸ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.

⁹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁰ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; I PROJ – Individual Project (>20 credits); G PROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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3		M-M/OPS	Strategic Operations Management	Dr Abdelkader Aoufi	20		10	N	26/10/22	26/10/22	14/11/22	50	GCW	100				30/11/22	
4		M-M/MKT	Strategic Marketing	Prof Vasilis Theoharakis	20		10	N	14/10/22	14/10/22	10/11/22	50	ICW GPRES	60 40				16/11/22 09/11/22	
5		M-M/EOS	Economics of Organisations and Strategy	Dr Catarina Figueira	20		10	N	11/10/22	11/10/22	11/11/22	50	GCW	100				08/12/22	
6		M-M/ENT	Entrepreneurship and New Venture Creation	Dr Oksana Koryak	20		10	Y	01/11/22	01/11/22	21/11/22	50	GCW	100				23/11/22	
7		M-M/ESB	Entrepreneurial Finance	Dr Stephanie Hussels	20		10	Y	23/11/22	23/11/22	02/12/22	50	GCW	100				16/12/22	
8		M-M/FIN	Financial Management	Dr Andrea Moro	20		10	N	31/01/23	31/01/23	02/03/23	50	EX	100				23/03/23	
9		M-M/STG	Strategic Management	Andrey Pavlov	20		10	N	02/02/23	02/02/23	14/02/23	50	GPRES	100				21/02/23	

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10		M-M/PMI	Project Management Introduction	John Algar	20		10	N	09/01/23	09/01/23	13/01/23	50	EX	40				23/03/23	
													GCW	10				13/01/23	
													GPRAC	20				13/01/23	
													GPRES	20				13/01/23	
													IPRAC	10				13/01/23	
11		M-M/GME	Global Macroeconomics and Business Environment	Prof Joe Nellis	20		10	Y	20/02/23	20/02/23	13/03/23	50	GCW	100				17/03/23	
12		M-M/MPC	Challenges for Leaders: Managing People and Change	Dr Mengyi Xu	20		10	Y	24/01/23	24/01/23	09/02/23	50	ICW	100				27/02/23	
13		MXM/LSB	Leading Sustainable Business	Dr Miying Yang	20		10	Y	07/02/23	07/02/23	17/02/23	50	ICW	100				08/03/23	
14		M-M/IBA	International Business Assignment	Dr Emma Parry	20		10	Y	02/06/23	02/06/23	12/06/23	50	ICW GCW	20 80				02/08/23	

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15		M-M/DMDA	Data Analytics and Decision Making	Dr Catarina Figueira	40		20	N	07/11/22	07/11/22	TBC	50	GCW	100				14/06/23	
15a		M-M/DMDAC	Decision-Making and Data Analytics (Chilean students only) – supplemented by APL	Dr Catarina Figueira	40		20	N	07/11/22	07/11/22	TBC	50	GCW	100				14/06/23	
16		M-M/LIA	Leadership in Action	Lyn Lanka	20		10	N	11/04/23	11/04/23	16/06/23	50	ICW	100				28/06/23	
17		M-M/IST	International Strategy		20		10	Y	Not Running in 2022-23			50	GCW ICW	80 20					
18		M-M/MMA	Managing International Mergers and Acquisitions		20		10	Y	Not Running in 2022-23			50	GCW	100					
19		M-M/CFS	Corporate Financial Strategy	Wasim Ahmad	20		10	Y	12/04/23	12/04/23	16/05/23	50	ICW	100				24/05/23	

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20		M-M/CFT	Corporate Finance Transactions		20		10	N	Not Running in 2022-23				ICW GCW	10 90					
21		M-M/SCC	Strategizing in Challenging Contexts	Andrey Pavlov	20		10	Y	14/04/23	14/04/23	24/05/23	50	GCW	100				31/05/23	
22		M-M/SHR	Strategic Human Resource Management in the 21 st Century	Dr Valentina Battista	20		10	Y	Not Running in 2022-23			50	ICW	100					
23		M-M/DVSC	Driving Value Through the Supply Chain	Heather Skipworth	20		10	Y	13/04/23	13/04/23	27/04/23	50	ICW	100				10/05/23	
24		M-M/NBO	Negotiating in Business and Organisations	Dr Javier Marcos	20		10	Y	03/07/23	03/07/23	07/07/23	50	GPRAC ICW	80 20				19/07/23	
25		M-M/MSI	Managing Strategic Innovation		20		10	N	Not Running in 2022-23				GCW	100					

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26		M-M/BL	Business Law	Dr Anicee van Engeland	20		10	Y	Not Running in 2022-23			50	ICW	100					
27		M-M/IHN	Identifying (Customers') Hidden Needs						Not Running in 2022-23			50							
28		M-M/IRM	Investment and Risk Management	Prof Sunil Poshakwale	20		10	N	13/04/23	13/04/23	28/04/23	50	EX	100				21/06/23	
29		M-M/LSO	Leading Sales and Customer Management Organisations	Dr Javier Marcos	20		10	Y	03/07/23	03/07/23	06/07/23	50	ICW	100				26/07/23	
30		M-M/CPPM	Major Critical Projects and Programme Management – a Sectoral Approach						Not Running in 2022-23			50							

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31		M-M/LMF	Leading and Managing the Family Enterprise	Dr Stephanie Hussels	20		10	Y	11/05/23	11/05/23	30/05/23	50	GCW	100				23/06/23	
32		M-M/SQM	Strategic Quality Management						Not Running in 2022-23										
33		M-M/LTP	Leaders as Thinkers: Leadership through Philosophy	Dr Andrey Pavlov	20		10	N	11/04/23	11/04/23	23/05/23	50	ICW	100				30/06/23	
34		M-M/IP	Independent Project				10	Y	Not Running in 2022-23			50	ICW	100					
34a		M-M/IP1	Independent Project				10	Y	Not Running in 2022-23			50	ICW	100					
35		M-M/IP2	Independent Project	Leila Alinaghian			20	Y	11/04/23	11/04/23	31/08/23	50	ICW	100				06/09/23	
36		M-M/GP1	Group Project				10	Y	Not Running in 2022-23			50	GCW	100					

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37		M-M/GP2	Group Project	Leila Alinaghian			20	Y	11/04/23	11/04/23	31/08/23	50	GCW	100				06/09/23	
38		M-ME/EMEP	Energy Markets. An Executive Perspective						Not Running in 2022-23										
39		M-ME/SCET	Sustainable and Conventional Energy Technologies						Not Running in 2022-23										
40		M-ME/FPEC	Value Chain of Fuels Production and Energy Conversion						Not Running in 2022-23										
41		M-ME/RMD M	Risk Management and Decision Making in Energy Industry						Not Running in 2022-23										
42		M-ME/RMS	Resource Management Strategy						Not Running in 2022-23										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
43		M-ME/SECP	Specialised Energy Consultancy Project						Not Running in 2022-23										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-M/ENT	Entrepreneurship and New Venture Creation	Master of Business Administration	Executive Master of Business Administration
M-M/ESB	Entrepreneurial Finance	Master of Business Administration	Executive Master of Business Administration
M-M/GME	Global Macroeconomics and Business Environment	Master of Business Administration	Executive Master of Business Administration
M-M/MPC	Challenges for Leaders: Managing People and Change	Master of Business Administration	Executive Master of Business Administration
M-M/IBA	International Business Assignment	Master of Business Administration	Executive Master of Business Administration
M-M/CFS	Corporate Financial Strategy	Master of Business Administration	Executive Master of Business Administration
M-M/SCC	Strategizing in Challenging Contexts	Master of Business Administration	Executive Master of Business Administration
M-M/SHR	Strategic Human Resource Management in the 21st Century	Master of Business Administration	Executive Master of Business Administration
M-M/DVSC	Driving Value Through the Supply Chain	Master of Business Administration	Executive Master of Business Administration
M-M/NBO	Negotiating in Business and Organisations	Master of Business Administration	Executive Master of Business Administration
M-M/LSO	Leading Sales and Customer Management Organisations	Master of Business Administration	Executive Master of Business Administration
M-M/LMF	Leading and Managing the Family Enterprise	Master of Business Administration	Executive Master of Business Administration
M-M/IP2	Independent Project	Master of Business Administration	Executive Master of Business Administration
M-M/GP2	Group Project	Master of Business Administration	Executive Master of Business Administration
MXM/LSB	Leading Sustainable Business	Executive Master of Business Administration	Master of Business Administration

8. How are the ILOs assessed?

The following assessment types are utilised:

The programme uses a range of assessment types. In addition to closed book and open book written examinations, students undertake a wide range of projects. Written Assessments of Case Study (WACs) are very valuable learning whereby students working with their teams determine the answer to a question posed around a case study, but then each member of the team must write up an individual report consisting of no more than 1,500 words. The assessment is excellent training for writing business reports under time pressure. A more unusual type of assessment is the simulation. Here students – again working in teams – might be required to build a warehouse or an electrical product – within a limited period of time, where information may be given and/or changed at intervals. Many projects involve working with a company on

a live project. Towards the end of the programme there will be the opportunity for some students to work on company based projects or short term internships, assessed through a written report.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. MBA

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
01	IPROJ		IPROJ	IPROJ	IPROJ	IPROJ			IPROJ		
02	EX	EX			ICW						
03	MULTI	MULTI	MULTI	MULTI			MULTI	MULTI			
04	MULTI	ICW	ICW		ICW		MULTI	MULTI			
05		EX		EX	ICW			ICW			
06		GCW	GCW	GCW			GCW	GCW	GCW		GCW
07				MULTI	MULTI		MULTI	MULTI			MULTI
08	ICW				EX			ICW		ICW	
09	GPRES		ICW	GPRES	ICW		GPRES	GPRES		GPRES	
10	EX	MULTI		EX	EX		MULTI	MULTI			
11	GCW			GCW	GCW	GCW					
12	EX					EX		EX			EX
13	ICW	ICW	ICW	ICW	ICW						
14	GCW		ICW	GCW	ICW / GCW		GCW	GCW		GCW	
15					EX / GPROJ		GPROJ				
15a	ICW	ICW				ICW				ICW	
16	ICW							ICW	ICW		ICW
17			ICW / GCW	ICW			GCW	GCW			
18			GPRES	GPRES / GCW	GCW			GPRES			
19	EX		EX		EX						
20	ICW / GCW	ICW			GCW		GCW	GCW			
21			GPRES / GWC	GWC	GWC		GPRES / GWC	GWC			
22	ICW	ICW								ICW	ICW
23	ICW	ICW			ICW						ICW
24	GPRAC				ICW		ICW				
25				GWC	GWC		GWC	GWC			
26	ICW				ICW					ICW	
27				GWC			GWC	GWC		GWC	

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
28				EX	EX						EX
29											
30		GPRES GCW	GPRES GCW	GPRES GCW	GPRES GCW		GCW	GPRES GCW			
31		GWC	GWC	GWC	GWC			GWC	GWC		
32		GWC	GWC		GWC			GWC			
33	ICW		ICW	ICW	ICW	ICW			ICW	ICW	
34/34a		ICW	ICW	ICW	ICW	ICW			ICW		ICW
35		ICW	ICW	ICW	ICW	ICW			ICW		ICW
36		GCW	GCW	GCW	GCW	GCW			GCW		GCW
37		GCW	GCW	GCW	GCW	GCW			GCW		GCW
38			ICW GCW	ICW GCW	ICW GCW		ICW GCW	ICW GCW			
39			ICW GCW	ICW GCW	ICW GCW		ICW GCW	ICW GCW			
40			ICW GCW	ICW GCW	ICW GCW		ICW GCW	ICW GCW			
41			ICW GCW	ICW GCW	ICW GCW		ICW GCW	ICW GCW			
42			ICW GCW	ICW GCW	ICW GCW		ICW GCW	ICW GCW			
43	ICW	ICW	ICW	ICW	ICW	ICW	ICW	ICW	ICW	ICW	ICW

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality

Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The list of opportunities available to our MBAs after graduating is extremely wide. Drawing on recent surveys of our graduates the most popular functions were as follows:

General Management
Engineering and R & D Management
Consultancy
Business Development
Strategy
Sales/Marketing
Finance/Accounting
Operations
IT Project Management

In addition a small but growing number of students set-up their own businesses, though this number increases after two to three years post graduation

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 04/02/2021 / 15/06/22

1. What is the course?

Course information

Course Title	MSc in Mechanical Engineering
Course code	MSc – MSMEETC PgDip (exit route only) - PDMEETC PgCert (exit route only) - PCMEETC
Academic Year	2022/23 2021/22
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Part time
Location(s)¹ of Study	Jiangsu University Cranfield Tech Futures Graduate Institute, China. (with an optional 6 month 'excursion' at Cranfield) JSU CU Joint Institute, China with optional 6 month excursion to Cranfield
School(s)	Jiangsu University Cranfield Tech Futures Graduate Institute affiliated with the School of Water, Energy and Environment
Theme	Energy and Power
Centre	Energy Engineering
Course Director	Dr Joy Sumner
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Jiangsu University Cranfield Tech Futures Graduate Institute
Admissions body	Cranfield University and Jiangsu University
Entry requirements	Standard University entry requirements.
UK Qualifications Framework Level	QAA FHEQ Level 7
Benchmark Statement(s)	N/A
Registration Period(s) available	3 years part-time MSc
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute” which is a formal collaboration between Cranfield and Jiangsu Universities. It has a formal semi-autonomous status as a Chinese-centred Institute that benefits from Cranfield academic input. It has been heavily sponsored by the Jiangsu Provincial Department of Education (the regional education body) and has the formal approval from the Ministry of Education in China. The Institute will have a physical presence in the grounds of Jiangsu University with significant investment from JSU and the Jiangsu provincial government to support the infrastructure.

Research interests include:

Fluid mechanics
Structural integrity
Risk
Materials research
Marine structures

Cranfield University interacts with the following institutions and in the following ways:

- Jiangsu University as part of the Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

Cranfield University offers this course in order to provide advanced, post-graduate education in the theory and practice of Mechanical Engineering. The course includes a broad range of Mechanical Engineering topics particularly relevant to the Energy and low carbon technology sectors, allowing students to master modern experimental methods and skills relevant to this discipline. Furthermore, students will connect theory with practice, developing their ability to independently engage in scientific research or independently undertake specialized technical work in science/engineering with a focus on supporting the development of innovative, low carbon technologies.

Material is presented in the course at the JSU CU Joint Institute at Jiangsu University, China. Students have the option to spend 6 months at Cranfield during their second year. Cranfield’s modules deal with Risk and Reliability Engineering, Modern Control Systems, Marine Structures for Renewable Energy,

Fluid Mechanics and Loading and Engineering Stress Analysis Theory. Modules from Jiangsu Institute cover Engineering Mathematics, Engineering Ethics, and elective modules focussed on processing.

The course will appeal to graduates and practicing engineers who wish to enhance their understanding of Mechanical Engineering with a view to management of large engineering projects, particularly within the low carbon or green technology sectors.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

1. Graduates and practicing engineers who wish to enhance their knowledge of various mechanical engineering fields with a view to managing key engineering projects.
2. Graduates currently in employment who wish to extend their technical qualifications or up-skill their qualifications.
3. Graduates with science degrees or from other branches of engineering who wish to pursue a career change and require a conversion course.
4. Candidates with other educational qualifications but who possess considerable relevant experience.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Mechanical Engineering

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Critically evaluate and apply mechanical engineering techniques necessary for solutions in the energy and low carbon sectors.
- ILO 2. Design appropriate strategies for employing engineering technologies to provide solutions suitable for international industries and/or research organisations
- ILO 3. Appraise, evaluate and interpret information and theories applied to the engineering solution of problems as such in fluid dynamics and loading, engineering stresses, control system modelling, or processing technologies.
- ILO 4. Assess and interpret methodologies and techniques required for the ethical planning and execution of engineering projects, including minimisation of risks.

B. Postgraduate Diploma in Mechanical Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Integrate knowledge, understanding and skills from the taught modules into a real-life situation to address problems faced by engineers. This will include a detailed review of the literature related to this problem, with the student providing insight and communicating the findings in a professional manner in written, oral, or visual forms as required.

C. MSc in Mechanical Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-reflection and originality of thought.
- ILO 7. Communicate their individual research via an academic paper (thesis), thus demonstrating a presentation style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

Engaging with the wider learning environment at Cranfield and Jiangsu through attendance of seminars, lectures, workshops and other learning activities. The students will have access to the e learning support through the VLE.

The taught programme is generally delivered from September and is divided into 9 modules (5 delivered by Cranfield and 4 by Jiangsu staff). All modules will be taught at the JSU CU Joint Institute at Jiangsu University, China. Modules taught by JSU staff are delivered over a full semester. Modules delivered by CU staff are delivered over one week or two weeks in a flying faculty model, with additional online tutorials provided post-delivery by CU staff and face to face support by JSU teaching assistants.

The dissertation/literature review and thesis/paper components are supported through student supervision meetings with both JSU and CU academic supervisors. These will be both face to face and online.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	AO
ELECTIVE MODULES:	
Any 6 modules (60 credits) from:	
Engineering Stress Analysis: Theory and Simulations (CU delivery)	10
Modern Control Systems (CU delivery)	10
Risk and Reliability Engineering (CU delivery)	10
Marine Structures for Renewable Energy (CU delivery)	10
Fluid Mechanics and Loading (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Advanced Functional Material and Forming Technology (JSU delivery)	10
Laser Processing Technology (JSU delivery)	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

Induction Week	AO
Engineering Stress Analysis: Theory and Simulations (CU delivery)	10
Modern Control Systems (CU delivery)	10
Risk and Reliability Engineering (CU delivery)	10
Marine Structures for Renewable Energy (CU delivery)	10
Fluid Mechanics and Loading (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Dissertation (Critical Literature Review)	40
ELECTIVE MODULES:	
Select 1 module from:	
Advanced Functional Material and Forming Technology (JSU delivery)	10
Laser Processing Technology (JSU delivery)	10
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	AO
Engineering Stress Analysis: Theory and Simulations (CU delivery)	10
Modern Control Systems (CU delivery)	10
Risk and Reliability Engineering (CU delivery)	10
Marine Structures for Renewable Energy (CU delivery)	10
Fluid Mechanics and Loading (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Dissertation (Critical Literature Review)	40
Thesis (Academic Paper)	80
ELECTIVE MODULES:	
Select 1 module from:	
Advanced Functional Material and Forming Technology (JSU delivery)	10
Laser Processing Technology (JSU delivery)	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September and are expected to complete the course within 3 years.

The students will be registered part-time for the course, starting in September and are expected to complete the taught section of the course within 36 calendar months.

Taught part 1: Modules (Second semester of Year 1)

Each Cranfield module is delivered over approximately five days, using a combination teaching activities and a blended learning approach. The Jiangsu Institute modules are delivered across the entire semester. Taught modules are delivered the JSU CU Institute at Jiangsu University. Modules are given throughout the second semester of Year 1. Exams will be held at determined points of the academic calendar. Students will undertake these modules in the first academic year.

Taught part 2: Dissertation (Critical Literature Review) (first semester of Year 2)

The literature review/dissertation consists of a total of 10 contact hours with a member(s) of the teaching staff and 390 hours of private study. Students will be assigned two supervisors by the Course Director and will agree with these supervisors an appropriate topic of study. This may be related to a future workplace/industrial area of interest that is relevant to the student's career plan. This aspect will include a comprehensive literature review of classical and contemporary related material and also a discussion and properly argued conclusions. Where appropriate the review/dissertation will acknowledge the work and contribution of others. This module will be assessed by a formal report. (There is the option of the students attending a 6 month field trip to Cranfield in Year 2 to support one of their projects.)

Taught Part 3: Thesis (Academic Paper) (second semester of Year 2)

Students will produce a thesis / paper. This consists of a total of 20 contact hours with a member(s) of the teaching staff and 780 hours of private study. Thesis supervisors will be allocated to the students by the Course Director and the two will confirm a suitable topic for study. Within this time, they will produce an academic paper in a journal style relevant to their area of interest (decided in consultation with their supervisor). All students are required and must maintain regular contact (meetings, telephone conversations or e-mail correspondence) with their personal supervisor to discuss progress. (There is

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

the option of the students attending a 6 month field trip to Cranfield in Year 2 to support one of their projects.)

7. **Course Level Assessment Strategy**⁴

TAUGHT MODULES:

The assessment strategy for the taught modules is to have a wide range of assessment types. This includes:

WRITTEN ASSIGNMENTS (individual course work):

*Engineering Stress Analysis: Theory: Analysing provided experimental data, running a finite element simulation and validating the results; in this formal report the details of the model set-up, partitioning, boundary conditions, meshing strategy and data extraction must be explained and discussed.

*Modern Control Systems: Model and design a control system followed by analysis on control performance for an industrial process example. The typical length of the report should be within 2000 but no less than 1000 words.

*Marine Structures for Renewable Energy: Students are required to individually conduct a structural design project and summarise results into a technical report (maximum 5 pages).

*Fluid Mechanics and Loading: A clear assignment discussing three technical areas.

*Engineering Ethics: A report on engineering ethics (10-15 pages)

*ELECTIVE Advanced Functional Material and Forming Technology: Research status, development trend and latest industrial applications of B functional materials at home and abroad (10-15 pages).

*ELECTIVE Laser Processing Technology: A report on the latest application and development of laser processing technology in industry (10-15 pages).

EXAMS:

*Risk and Reliability Engineering: Demonstrate the understanding and ability to apply the theories and concepts taught in the module

*Engineering Mathematics: Demonstrate the understanding and ability to apply the theories and concepts taught in the module

Summative assessment will address the course ILOs:

Engineering Stress Analysis: Theory: 1, 2, 3

Modern Control Systems: 1, 2, 3

Risk and Reliability Engineering: 1, 2, 4

Marine Structures for Renewable Energy: 1, 2, 3, 4

Fluid Mechanics and Loading: 1, 2, 3

Engineering Mathematics: 1, 3

Engineering Ethics: 4

ELECTIVE Advanced Functional Materials and Forming Technology: 1, 2, 3

ELECTIVE Laser Processing Technology: 1, 2, 3

The individual coursework reports will help students in their future employment and professional practice in disseminating information, while the exams are intended to evaluate students' handling of applying a novel situation to an existing framework for solution.

Formative feedback includes:

*Guided Exercises/Numerical Sessions (Fluid Mechanics and Loading, Structural Integrity): to take students through representative problems and familiarise them with different tactics for tackling them.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

*Case studies/Examples workshops (Fluid Mechanics and Loading, Risk and Reliability Engineering, Engineering Ethics): to allow students to discuss real world examples of the theory they are learning.

*Group discussions (Risk and Reliability Engineering, Modern Control Systems, Marine Structures for Renewable Energy, Engineering Mathematics, Advanced Functional Material and Forming Technology): engage in and contribute to group discussions during the lectures, practical sessions and workshop.

*Practical/Workshop Sessions (Fluid Mechanics and Loading, Risk and Reliability Engineering, Marine Structures for Renewable Energy, Modern Control Systems): to allow experience of representative skill sets.

*Student Presentations (Advanced Functional Material and Forming Technology, Laser Processing Technology): students practice presentation skills, reflect upon their experience, and get feedback from staff.

The VLE is used to provide formative feedback in modules including Engineering Stress Analysis: Theory

Dissertation (Critical Literature Review):

The Literature Review/Dissertation provides the students with the opportunity to research, in depth, an area of engineering interest to them. It is expected that the review/dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation and setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit an 8,000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.

Thesis (Academic Paper):

The thesis project requires students to further develop a problem definition, set a hypothesis, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the courses following this module. The student is then required to communicate their findings successfully via a thesis, written in the style of a scientific paper (12,000 words), and an oral presentation. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the dissertation, to deliver a high-quality written thesis and oral presentation.

Course modules

The following modules outline all parts of the programme leading to an MSc in Mechanical Engineering. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Assessment Submission and/or exam date ⁹	Assessment / Exam Retake date
1	J-JSU-INDWK	Induction Week	Gill Drew	24		0	Y		07/11/22	11/11/22	N/A	AO	N/A	N/A	N/A
2	N-AME-ESA Occ B	Engineering Stress Analysis: Theory and Simulations	Luofeng Huang	32		10	Y		05/06/23	16/06/23	40%	ICW	100%	01/07/23	TBC
3	J-MEE-MCS	Modern Control Systems	Liyun Lao	36		10	N		15/05/23	26/05/23	40%	ICW	100%	03/06/23	TBC
4	N-AME-RR Occ B	Risk and Reliability Engineering	Nigel Simms	27		10	Y		13/02/23	24/02/23	40%	EX	100%	w/c 06/03/23	TBC
5	J-MEE-MSRE	Marine Structures for Renewable Energy	Liang Yang	36		10	N		17/04/23	28/04/23	40%	ICW	100%	13/05/23	TBC
6	N-AME-FML Occ B	Fluid Mechanics and Loading	Liang Yang	30		10	Y		13/03/23	24/03/23	40%	ICW	100%	01/04/23	TBC

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.

⁹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Assessment Submission and/or exam date ⁹	Assessment / Exam Retake date
7	J-MEE-EM	Engineering Mathematics	Tan YiLan	24		10	Y		Sept 2022	Jan 2023	40%	EX	100%		TBC
8	J-EGM-EE	Engineering Ethics	Ding Hua	32		10	Y		Sept 2022	Jan 2023	40%	ICW	100%		
9	J-MEE-FMFT	Advanced Functional Material and Forming Technology	Xu Xiaojing	32		10	N		Sept 2022	Jan 2023	40%	ICW	100%		
10	J-MEE-LPT	Laser Processing Technology	Zhou Jianzhong	32		10	N		Sept 2022	Jan 2023	40%	ICW	100%		
11	J-MEE-DISS	Dissertation (Critical Literature Review)	Joy Sumner	10		40	Y		06/02/23	17/11/23	50%	I PROJ IPRES	80% 20%	17/11/23	
12	J-MEE-THESIS	Thesis (Academic Paper)	Joy Sumner	20		80	Y		08/05/23	14/06/24	50%	THESIS OR	90% 10%	14/06/24	

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
J-JSU-INDWK	Induction Week	Agricultural Engineering	Mechanical Engineering Environmental Engineering Engineering Management Energy Systems and Thermal Processes Environmental Engineering and Environmental Management Materials and Corrosion for Energy Systems
N-AME-ESA	Engineering Stress Analysis Theory	Advanced Mechanical Engineering	Renewable Energy (Engineering Route) Mechanical Engineering
N-AME-RR	Risk and Reliability Engineering	Advanced Mechanical Engineering	Mechanical Engineering
N-AME-FML	Fluid Mechanics and Loading	Advanced Mechanical Engineering	Renewable Energy (Engineering Route) Mechanical Engineering
J-EGM-EE	Engineering Ethics	Engineering Management	Engineering Management Environmental Engineering (Jiangsu) Mechanical Engineering
J-MEE-EM	Engineering Mathematics	Mechanical Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering

8. **How are the ILOs assessed?**

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have two written examinations, eight pieces of assessment by submitted work and two elements of assessment by presentation or viva. This approach has been adopted in order to provide a balance between formal examination and a less rigid written/verbal communication.

This approach has been adopted because:

Assessment by Exams:

The underlying assessment strategy across all modules will be to examine the understanding of mechanical engineering principles and applications. This will be achieved by testing the ability to solve realistic multi-disciplinary problems within a Mechanical Engineering context. Proper application and appreciation of mechanical engineering models and methodologies will be paramount to the successful completion of the course.

Assessment by Coursework:

Coursework will be set to reinforce and expand taught elements of the course. This will be a combination of open ended assignments and analytical/numerical based problem solving. Coursework

will be assessed on the rigour and quality of the reports with merit given to diligence and evidence of understanding of the underlying methods.

Assessment by the Dissertation (Critical Literature Review):

- The ability to plan, structure and manage a detailed study of an engineering process, system, component or methodology and to communicate results in a clear manner;
- The ability to assemble an engineering activity into a coherent study formulating properly argued conclusions and where appropriate building upon and acknowledging the work and contribution of others;
- The ability to analyse and where appropriate to relate to the work of others and to be self critical;
- To communicate the dissertation in an oral presentation and in a technical and well presented document.

Assessment by MSc Thesis (Academic Paper):

The Individual Research Project (IRP) tests:

- The ability to define the project by reference to scientific, technical and/or commercial literature, the critical appraisal of such literature and the justification of the research;
- The ability to plan and manage the research programme, to define the work to be carried out and to report the results in a clear manner;
- The ability to analyse the work, relate it to the work of others where appropriate and to be self-critical;
- To communicate the work, its results and analysis in a technical and well-presented document.

Oral components of Dissertation (Critical Literature Review) and Thesis (Academic Paper):

- Each course member is required to make a formal presentation on his/her Individual Research Project.
- Upon submission, all theses are reviewed by two internal examiners (one examiner being the course member's supervisor), plus the external examiner.
- If the Individual Research Project mark awarded by the internal examiners varies significantly, then a third internal examiner is appointed.
- All course members are subject to a presentation or viva voce examination in the presence of members of Academic staff.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4
2	ICW	ICW	ICW	
3	ICW	ICW	IWC	
4	EX	EX		EX
5	ICW	ICW	ICW	ICW
6	ICW	ICW	ICW	
7	EX		EX	EX
8				ICW
9	ICW	ICW	ICW	

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4
10	ICW	ICW	ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO5
11	IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO6	ILO7
12	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Graduates from the course will be equipped with the academic skills and requirements to successfully pursue a career in a Mechanical Engineering discipline whether this is technical, management or research.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: March 2022

1. What is the course?

Course information

Course Title	MSc in Metal Additive Manufacturing
Course code	MSMAMFTC, MSMAMPTC, PDMAMFTC, PDMAMPTC, PCMAMFTC, PCMAMPTC
Academic Year	2022-2023
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	
Mode of delivery	Full-time, Part-time
Location(s) ¹ of Study	Cranfield University,
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Welding Engineering and Laser Processing
Course Director	Dr Yongle Sun
Awarding Body	Cranfield University
Is this an AP Contract course? ²	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N.A
Is the Degree apprenticeship integrated or non-integrated?	N.A
Is the Mastership offered as an open and/or closed course?	N.A
Teaching Institution	Cranfield University
Admissions body	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc: 1 year Full-time PgDip: up to 1 year Full-time PgCert: up to 1 year Part-time MSc: 3 years Part-time PgDip and PgCert: 2 years
Course Start Month(s)	Full-time MSc: September Part-time: throughout the year

Institutions delivering the course

This course is delivered by School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Welding Engineering and Laser Processing Centre where the research interests include:

Arc and Laser Wire-Based Additive Manufacture
 Mechanical working on deposits to improve microstructural features and mechanical strength and understand the correlation between microstructural refinement and mechanical properties
 Laser Micro-Joining
 High Power Laser Welding
 Hybrid Laser/Arc Welding
 Weld Repair and Modelling

Within the Welding Engineering and Laser Processing Centre, the Additive Manufacturing (AM) team has been pioneering research in large-scale AM of metallic structures since the '90s, with a major push for more than 10 years. Cranfield University has been active on all required fronts, i.e. process design; incorporation of ancillary processes (cold work, metrology, inspection); development of specialist hardware and CAM software; qualification of material properties; and definition of design and manufacturing rules. The ever-growing materials portfolio is impressive, and features alloys systems such as titanium-, aluminium-, iron-, nickel-, copper-based ones, as well as more exotic elements such as tungsten, molybdenum, and tantalum.

Notable results include:

- worlds' largest monolithic metal AM part, a 6-m 300-kg aluminium spar structure
- several primary structural elements for both military and civil applications (spar, ribs, bracket, mounts, bulkheads), with the required level of structural integrity, and planar area as big as 2m x 1.5m (already validated on a real primary airframe component)
- pressure vessels for manned and unmanned space missions, up to 1m tall and 40kg heavy
- rocket motor bodies
- net-shape deposition of small structures i.e. 1-2mm thick.

Students will have access to several state-of-the-art AM facilities, including Wire + Arc AM systems based on robotic arms or CNC gantries, laser-wire AM systems, as well as powder-based systems too.

Moreover, the students will join a teaching and research team of approximately 30 people, and should have the chance to work on projects within the WAAMMat consortium, that currently counts 20 industry partners (including Airbus, BAE SYSTEMS, Lockheed Martin, etc). More details on waammat.com

Cranfield University interacts with the following institutions and in the following ways:

1. Students may undertake their research and/or project work off campus
2. Significant input to the teaching of two of the modules (Metal AM Processes, and Post-processing for AM) will be provided by the University of Birmingham.

Cranfield University will retain overall responsibility for the modules and therefore the partnership may be described as "Partner Support". The formal process of partnership recognition has been initiated.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by the Institution of Mechanical Engineers (IMechE) and Royal Aeronautical Society (RAeS) until August 2026.

2. What are the aims of the course?

Cranfield University offers the MSc course in order to deliver graduates who are able to hold positions of significant engineering responsibility in the wide range of organisations using Metal Additive Manufacturing Technologies. This course provides students with the latest knowledge and skills for metal Additive Manufacturing (AM) providing a great foundation for a future career. This includes AM processes and their capabilities, designing AM systems, qualification, modelling and materials. Practical experience will be gained through assignments and group and individual projects in close collaboration with leading industrial end users. The graduate will meet a major part of the requirements for membership of the appropriate professional organisations and will have experience and skills in the management of research and development projects.

This programme is intended for the following range of students:

Students with a background in Engineering, Materials Science and Physics.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Evaluate the applicability of Metal AM to real use cases
- ILO 2. Assess the impact of a metal additive manufacturing and other net-shape processes to a component's material, microstructure and mechanical properties.
- ILO 3. Design parts for additive manufacturing and analyse loads to predict structural performance.
- ILO 4. Evaluate the impact of metal additive manufacturing on cost, operations and supply chain against conventional processes.
- ILO 5. Evaluate the requirements of health and safety legislation in relation to AM, and demonstrate knowledge of National, European and International standards relating to quality assurance in AM.
- ILO 6. Evaluate the quality of data and determine its relevance in research and industrial contexts

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Communicate effectively results of developments, proposals and analyses to specialist and non-specialist audiences, both orally and in writing.

- ILO 8. Plan, organise, undertake, and analyse research and industrial projects to increase knowledge and understanding of AM, and to evaluate the application of AM technology in industrial applications, also from a cost perspective.
- ILO 9. Propose new developments to solve AM technology problems, individually or as part of a team.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 10. Plan and manage research projects at the cutting edge of technology, show self-direction in the performance and analysis of research, and show on-going interest in advancing their knowledge and skills.]

4. How is the course taught?

Students will be supported in their learning and personal development by:

The Metal Additive Manufacturing course will deliver the modules through a mixture of flipped classroom, conventional lecture, lab exercises, and problem based learning.

In addition to the teaching methods outlined students will be supported in their learning and personal development by:

1. Comprehensive course materials (provided), as well as a web-site using the Canvas Virtual Learning Environment (VLE). Part-time students will be supported by granting remote access during lectures using video-conferencing facilities or other distance-learning methods.
2. Students are guided through the use of study texts, and use of interactive exercises. Problem-based learning will be included to promote self-centred learning. The TEL team will be involved in the preparation of some lecturing material.
3. Some of the material is designed to be delivered via Flipped Classroom format so that students prepare the material prior to arrival and then most of the tutorial session is devoted to performing exercises with feedback provided by the tutor. VLE will also be available throughout.
4. Course directors and module leaders will be available to provide support and advice on an informal basis to student queries. The same support will be provided to part-time students via email and telephone communication.]

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
Metal Additive Manufacturing Processes	30
Metal Additive Manufacturing Metallurgy	
ELECTIVE MODULES:	

One or both of: Management of Manufacturing Quality Post Processing for Additive Manufacturing	30
Up to two of the following (to make 30 credits total of elective modules): Finite Element Analysis for Additive Manufacturing Operations Management Additive Manufacturing System Design	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Induction week module 1	0
Seven taught modules 2-8	80
Group Project (9a)	40
ELECTIVE MODULES:	
None	
TOTAL:	120

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Induction week module 1	0
Seven taught modules 2-8	80
ELECTIVE MODULES:	
Group Project (9a) or Dissertation (9b)	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Induction week module 1	0
Seven taught Modules 2-8	80
Group Project (9a)	40
Individual Research Project (10)	80
ELECTIVE MODULES:	
None	
TOTAL:	200

PART TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Induction week module 1	0
Seven taught Modules 2-8	80
Individual Research Project (10)	80
ELECTIVE MODULES:	
Group Project (9a) or Dissertation (9b)	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time MSc students register for the course in September and are expected to complete the course within 11 calendar months.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $<40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($<50\%$).

The taught modules and group project are delivered between October and April, thereafter the full-time students undertake an individual research project. Both taught and flexible learning modules are taught over two weeks. The second week for the taught modules is largely free of structured teaching to allow time for more independent learning and reflection.

Full-time PgDip students register for the course in September and are expected to complete the course within 7 calendar months. The taught modules and group project are delivered between October and April.

Full-time PgCert students register for the course in September and are expected to complete the course within 5 calendar months. The taught modules are delivered between October and February.

The courses are also offered on a part-time basis. The overall duration of the part-time course would normally be 2-3 years; the maximum overall duration normally permitted will be 5 years. Both face to face and distance learning modules are taught over one to two weeks.

7. Course Level Assessment Strategy⁴

The assessment tasks are challenging and enable students to demonstrate a full range of skills and attributes. The pre-requisite modules Metal AM processes and AM metallurgy will introduce students to the fundamentals of each AM processes, and to the architecture of AM machines, whilst mastering the effects of processing conditions on the resulting microstructure and mechanical properties. The modules will be assessed through essays, presentations and a closed-book examination. The length of each assessment task is clearly stated within the module descriptor. Students will write employability relevant policy briefing documents to equip them with the skills they require to succeed in the field of metal AM, and to address the specific award ILOs 1-6. Students then have opportunities to develop their communication skills, as they are required to give a group presentation and individual presentation. The ability to work effectively in groups is a highly desirable skill which has translated into ILOs 7,8 and 9. Feedback is given immediately after the group presentation. Modules 3, 4, 7 and 8 are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback is given verbally within the classroom following discussions, via a written summary for case studies from the module leader and oral feedback provided by the tutor and peers for presentations. Students will also engage with an interactive learning activity which incorporates formative feedback. The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project. The research project addresses ILOs 10 and takes the form of a Thesis, typically written following the structure of a research paper. Students are expected to illustrate and defend their work at the end of the Thesis project.

⁴ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-MAT-INWK	Introduction	Dr Sue Impey	18		0	Y	03/10/22	03/10/22	07/10/22	N/A	AO	N/A				N/A	
2	N-MAM-MAMP	Metal Additive Manufacturing Processes	Dr Nguyen Van Anh	40	6	20	N	07/11/22	07/11/22	18/11/22	50	ICW	100				16/12//22	TBC – if required
3	N-MAM-MAMM	Metal Additive Manufacturing Metallurgy	Dr Supriyo Ganguly	20		10	N	19/10/22	19/10/22	25/10/22	50	EX	100				04/11/22	Manufacturing resit exams will be during week commencing: 15/05/23

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual assessments ¹⁰ (%)	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
4	N-MAM-FEAAM	Finite Element Analysis for Additive Manufacturing	Dr Yongle Sun	31	0	10	N	05/12/22	05/12/22	09/12//22	50	ICW	100				09/01/23	TBC – if required
5	N-MAM-MMQ	Management of Manufacturing Quality	Dr Graeme Barritte	40	0	10	N	09/01/23	09/01/23	13/01/23	50	ICW	100				06/02/23	TBC – if required
6	I-MNU-A1034	Operations Management	Dr Mohamed Shararah	32	0	10	Y	10/10/22	10/10/22	14/10/22	40	EX	100				12/12/22	Manufacturing resit exams will be during week commencing: 15/05/23
7	N-MAM-PPAM	Post Processing for Additive Manufacturing	Dr Surya Krishnaswamy	26	26	10	N	09/01/23	23/01/23	27/01/23	50	ICW	100				20/02/23	TBC – if required
8	N-MAM-AMSD	Additive Manufacturing System Design	Dr Surya Krishnaswamy	23	0	10	N	28/11/22	28/11/22	02/12/22	50	ICW	100				23/01/23	TBC – if required

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual assessments ¹⁰ (%)	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
9a	I-MAT-GRPP	Group Project	Dr. David Ayre	20		40	Y	30/01/23	30/01/23 Occ A FT	25/04/23 FT	50	GPRES GCW ICW IPRAC	16 64 10 10				25/04/23 02/05/23 02/05/23 02/05/23	
			Dr David Ayre (Dr Iva Chianella)						06/02/23 Occ B PT	01/08/23 PT	50	GPRES GCW ICW IPRAC	16 64 10 10				25/07/23 01/08/23 01/08/23 01/08/23	
9b	I-MAT-DISS	Dissertation for part-time students	Dr. David Ayre	20		40	Y	06/02/23	06/02/23	25/08/23	50	ICW ICW	90 10				25/08/23 25/08/23	
10	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y	06/02/23	06/02/23 cc A PT	PT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	
			Dr Muhammad Khan						28/04/23 cc B FT	FT 25/08/23	50	THESIS IPRES	90 10				25/08/23 29/08/23	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAT-INWK	Introduction	Advanced Materials	Aerospace Manufacturing, Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Maintenance Engineering & Asset Management
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing Global Product Development and Management Management and Information Systems Engineering Competence Manufacturing Technology and Management
I-MAT-GRPP	Group Project	Advanced Materials	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Welding Engineering, Maintenance Engineering & Asset Management
I-MAT-DISS	Dissertation for Part Time Students	Advanced Materials	Aerospace Materials, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Welding Engineering, Manufacturing Technology and Management, Maintenance Engineering & Asset Management
I-MNU-THESIS	Individual Research Project	Advanced Materials	Engineering and Management of Manufacturing Systems, Global Product Development and Management, Management and Information Systems, Aerospace Materials, Manufacturing Technology and Management, Welding Engineering, Aerospace Manufacturing, Maintenance

			Engineering & Asset Management
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8. How are the ILOs assessed?

The following assessment types are utilised:

Students can expect to have either examination or assessment by submitted work and elements of assessment by presentation or viva.

This approach has been adopted because:

It allows the students to demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1	Not assessed					
2	ICW	ICW		ICW	ICW	
3	EX			EX	EX	
4	ICW	ICW		ICW		
5			ICW	ICW	ICW	ICW
6			EX	EX		
7	ICW			ICW	ICW	ICW
8			ICW	ICW	ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 8	ILO 9
9a	GCW IPRAC GPRES ICW	GCW IPRAC	GCW
9b	ICW	ICW	ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 10
10	IPRES	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey.

The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5-year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Successful students develop diverse and rewarding careers in engineering management in a wide range of organisations deploying AM technologies. Roles include AM Manufacturing Engineer, Manager of AM Operations, AM Design Engineer, AM Materials Engineer and AM Cost Engineer. The international nature of such activities means that career opportunities are not restricted to the UK. Cranfield graduates develop careers around the world.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 2022

1. What is the course?

Course information

Course Title	Military Aerospace and Airworthiness
Course code	MSMAAPTR, PDMAAPTR, PCMAAPTR, SPMAAPTR
Academic Year	2022 – 2023
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	MSc, PgDip, PgCert
Mode of delivery	Part-time
Location(s)¹ of Study	Shrivenham and Cranfield campus
School(s)	Cranfield Defence and Security
Theme	N/A
Centre	Centre for Defence Engineering
Course Director	Dr John Economou
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Is this course offered as a Cranfield Mastership?	N/A
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	A first or Second honours degree in a relevant mathematics, science or engineering discipline; additionally an IELTS score of 7.0 is required by students for whom English is not a first language.
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	As set out in the Quality Assurance Agency for Higher Education subject benchmark statements for Engineering, Mathematics and Physics at Masters level
Registration Period(s) available	A student who registers for the PgCert will have a registration period of three years. For the PgDip this will be four years, and for the MSc five years.
Course Start Month(s)	September and January

Institutions delivering the course

This course is delivered by Cranfield Defence and Security (Shrivenham Campus) and the School of Aerospace, Transport and Manufacturing (Cranfield Campus), where the research interests include:

Cranfield University interacts with the following institutions and in the following ways:

The Military Aerospace and Airworthiness course is delivered through the Defence Academy with the primary customers being the Military Aviation Authority and the Defence Equipment and Support (DE&S) Organisation. The Course Team has worked closely with the customers to ensure that the course meets their educational requirements whilst maintaining the academic standards of the University.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by the Royal Aeronautical Society (RAeS) until August 2023 on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng). Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

The aim of the course is to provide education, on a part-time basis, for employees within the MOD's Defence Equipment and Support agency, the wider MOD, the Armed Forces, and the international defence industry to enable them to work more effectively in the fields of military aerospace technology, airworthiness and safety.

Suitably qualified students, who achieve an acceptable standard on the course, are awarded, as appropriate, either an MSc degree, Postgraduate Diploma (PgDip) or Postgraduate Certificate (PgCert) in Military Aerospace and Airworthiness (MAA) by Cranfield University.

The aims of the PgCert are:

- to provide students with a general understanding of the engineering and management theories, concepts, applications and practices in Military Aerospace and Airworthiness to enable students to relate their knowledge and understanding of Military Aerospace and Airworthiness to the interpretation and analysis of relevant engineering and management information.
- to equip students with the skills necessary to contribute effectively within their own organization and work with their customers and suppliers in the field of Military Aerospace and Airworthiness.

Military Aerospace and Airworthiness course specification: Version 1 August 2020

In addition to the PgCert the aims of the PgDip are:

- to provide students with the opportunity to acquire a broader knowledge base and a more holistic understanding of the engineering and management theories, concepts, applications and practices associated with Military Aerospace and Airworthiness than can be achieved at PgCert level.
- to enable students to relate their broader knowledge and understanding of Military Aerospace and Airworthiness to the interpretation and analysis of a more multidisciplinary range of engineering and management information than can be achieved at PgCert level.
- to equip students with the skills necessary to integrate effectively across a wide range of business groups within their own organisation as well as those of their customers and suppliers in the field of Military Aerospace and Airworthiness.

In addition to the PgDip the aims of the MSc are:

- that through the successful completion of a dissertation students will demonstrate independent learning and their ability to describe, analyse and critically review current research and methodologies in Military Aerospace and Airworthiness.
- for students to conduct a piece of original research, through an application of the knowledge, understanding and skills acquired during the taught phase, on a topic relevant to Military Aerospace and Airworthiness.

This programme is intended for the following range of students:

- engineers and scientists within the MOD's Defence Equipment and Support agency, the wider MOD, the Armed Forces, and the international defence industry.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Military Aerospace and Airworthiness

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Identify key theoretical principles, concepts and practices in military aerospace technology, airworthiness and safety
- ILO 2. Critically analyse the design, operation and performance of military aircraft at a level appropriate to airworthiness requirements
- ILO 3. Demonstrate a critical awareness of aviation safety management
- ILO 4. Utilise knowledge, theories and concepts to quantify and critically analyse operational and performance data for selected military aircraft
- ILO 5. Based upon the lessons learned from previous accidents produce reliable, valid and incisive conclusions regarding the key aspects affecting the airworthiness of military aircraft
- ILO 6. Critically evaluate the ways in which aviation safety is quantified and managed

B. Postgraduate Diploma in Military Aerospace and Airworthiness

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Demonstrate knowledge and critical understanding of a broad range of aviation disciplines and their interdependency in the context of military aerospace and airworthiness
- ILO 8. Demonstrate the application of knowledge and understanding in a complex multidisciplinary aerospace technology environment and within an airworthiness context
- ILO 9. Synthesise and critically analyse systems-level military aircraft data

Military Aerospace and Airworthiness course specification: Version 1 August 2020

C. MSc in Military Aerospace and Airworthiness

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 10. Identify relevant areas of previous research, placing them in context with a research project and providing critical appraisal
- ILO 11. Critically evaluate facts, concepts, principles and theories and articulate these through reasoned analysis and discussion
- ILO 12. Describe the background to an area of research, justify the research methodologies and discuss the main findings and conclusions in a viva voce examination
- ILO 13. Assess new research ideas, concepts or methodologies through the use of techniques such as experimentation, analytical models and numerical models
- ILO 14. Plan a research project with aims, objectives, risk assessment and time lines (with identification of critical path and contingencies)
- ILO 15. Engage confidently in academic and professional communication, reporting clearly and concisely

4. How is the course taught?

The course is delivered on a part-time modular basis and conforms to the University's system of 10 credits (100 learning hours) per module. It is taught, in general, by conventional means through student attendance of lectures at the Cranfield or Shrivenham campuses. Students will be provided with pre-course and post-course reading and assessment as dictated by the individual course modules. All lecture material, together with a non-assessed online mathematics self-taught module, made available through the CDS VLE (Moodle).

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
00 03, 04, 18, 21, 22	0 50
ELECTIVE MODULES:	
One module to the value of 10 credits chosen from 05-09, 11-17, 23-26	10
TOTAL:	60

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
Aeronautical Engineering Fundamentals short course for credit	20
CORE MODULES:	
00 03, 04, 18, 20	0 40
ELECTIVE MODULES	
N/A	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
00, 03, 04, 18, 21, 22, 15	0 60
ELECTIVE MODULES:	
Modules to the value of 60 credits chosen from 05-09, 11-14, 16-17, 23-26	60
TOTAL:	120

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
Aeronautical Engineering Fundamentals short course for credit	20
COMPULSORY MODULES:	
00 03, 04, 18, 20	0 40
ELECTIVE MODULES	
Modules to the value of 60 credits chosen from 05-09, 11-17, 24, 25, 26	60
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	

³ Aeronautical Engineering Fundamentals (AEF) is a five-week, 20-credit Accredited short course.

00, 03, 04, 18, 21, 22, 15 19	0 60 80
ELECTIVE MODULES:	
Modules to the value of 60 credits chosen from 05-09, 11-14, 16-17, 23-26	60
TOTAL:	200

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
Aeronautical Engineering Fundamentals short course for credit	20
COMPULSORY MODULES:	
00 03, 04, 18, 20 19	0 40 80
ELECTIVE MODULES	
Modules to the value of 60 credits chosen from 05-09, 11-17, 24, 25,26	60
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); ⁴
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis**, a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in either September and January and are expected to complete the course within 5 years.

Normal entry

The course is offered on a part-time basis only. The PgCert contains five compulsory modules shown next and one elective.

- MAA03: Airworthiness of Military Aircraft.
- MAA04: Aviation Safety Management.
- MAA18: Safety Assessment of Aircraft Systems.
- MAA21: Fixed-Wing Aeromechanics.
- MAA22: Propulsion Systems.

The compulsory modules provide an overarching introduction to the subject of military aerospace and airworthiness and impart the essential knowledge required by all students on the course. The first three modules cover the underpinning aspects of airworthiness and aviation safety. The latter two modules encompass the core elements of aerospace technology: aerodynamics; propulsion; flight mechanics; structures.

Students then choose one further module to complete the PgCert.

The PgDip (and MSc taught phase) students are required to complete the following six modules:

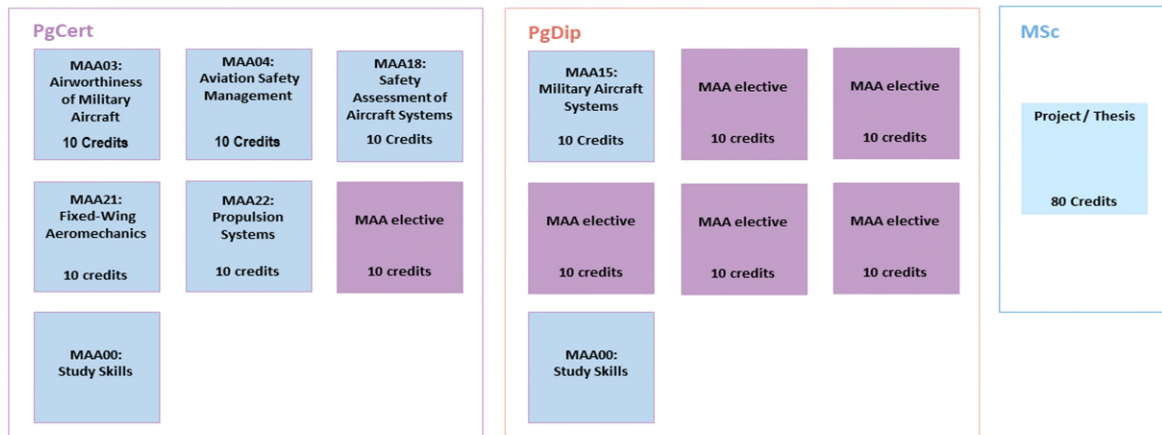
- MAA03: Airworthiness of Military Aircraft.
- MAA04: Aviation Safety Management.
- MAA18: Safety Assessment of Aircraft Systems.
- MAA21: Fixed-Wing Aeromechanics.
- MAA22: Propulsion Systems.
- MAA15: Military Aircraft Systems

Once the students have successfully completed the six PgCert modules (5 compulsory and one elective) then if they wish to continue (PgDip, MSc) then they will need to also complete module MAA15 which encompass the understanding of complex multidisciplinary aerospace technology and the synthesis and critical analysis of systems-level military aircraft both rotary and fixed wing.

Thereafter, the students can select an additional six elective modules leading to overall 120 taught phase credits. This provides the student with the flexibility to tailor their studies to account for prior educational and work experience and the current and future needs of their employment role.

The modules taken in the taught phase of the MSc (the PgDip) provide students with the knowledge and skills necessary to complete a research-based project, which forms the final part of the Masters award. Lecturing staff on both campuses will undertake supervision of research dissertations. The MSc and PgDip students are required to complete six modules rather than five. MAA15 module provides fundamentals of military aircraft systems enabling underpinning and understating of the aircraft wider systems within military context within a mechatronics perspective.

The following figure illustrates this.



AEF-Qualified Students

Students who have successfully passed the Aeronautical Engineering Fundamentals (AEF) Short Course for Credit may use the 20 credits obtained from that course plus a 10-credit top-up module (MAA20) in lieu of the following three 10-credit MAA modules.

- MAA21: Fixed-Wing Aeromechanics
- MAA22: Propulsion Systems
- MAA23: Rotary-Wing Aeromechanics

In addition, students complete the three compulsory airworthiness and aviation safety modules:

- MAA03: Airworthiness of Military Aircraft
- MAA04: Aviation Safety Management
- MAA18: Safety Assessment of Aircraft Systems

Students then choose a further six modules to complete the PgDip (MSc taught phase) plus a research project, which forms the final part of the Masters award.

Course calendar

This course is offered solely on a part-time basis. Students can join the programme in either September or January. The course timetable enables students to complete the compulsory modules in the first year with either start date. The course duration is expected to be:

Minimum period of registration

- PgCert: One year
- PgDip: One year
- MSc: Two years

Maximum period of registration

- PgCert: Three years
- PgDip: Four years
- MSc: Five years

7. Course Level Assessment Strategy⁵

The Military Aerospace and Airworthiness course consists of a range of challenging assessment tasks that are designed to enable the students to demonstrate a full range of skills and attributes. The PgCert course consists of seven modules: five compulsory modules, one elective, and an initial Study-Skills module (no credits). The PgDip consists of the PgCert modules and a further one more compulsory module and six more electives. The assessment strategy for the Study-Skills module offers the students' the opportunity to simulate the process of working on a general MAA research topic. The students would then need to submit on time their work and peer-review other students' work and provide their assessment. Part of this process also incorporates a further learning layer of the teaching team providing feedback on the students' peer-reviews. This process helps the students' at an early stage to engage and appreciate the level of work involved and the processes and tools involved in enabling and achieving this. The assessment is formative with timely feedback, and allows the academic team to evaluate students' comprehension, potential learning needs, and progress. The credit-bearing compulsory modules, (5-modules for PgCert, 6 modules for the PgDip and MSc), are assessed using mainly coursework based summative assessments for all modules and with two out of these modules also having an exam assessment. The MAA modules offer opportunities for further formative assessments in the form for example of a tutorial(s) and walk around physical full-scale aircraft including fixed-wing and rotary-wing, uninhabited, also Remotely Piloted Aircraft systems (RPAS), or inhabited aircraft which are available during the course. The students have the opportunity to demonstrate their comprehension and progress as part of this formative assessment process. For formative based discussions the academic team will provide immediate feedback and advice and for written work normally feedback would be provided in writing. With parts of the course offered as remote delivery (Military Aircraft Systems-MAS) as an example, the laboratory sessions and discussions take place via the use of suitable teleconferencing tools. Academics and students have opportunities to meet and discuss and provide live feedback to the students after they had the opportunity to present their coursework plan in relation to the ILOs and coursework targets.

It is expected that the students will continue to use teleconferencing tools and interact in addition to the scheduled timetabled sessions and exchange ideas and address the specific award ILO relating to demonstrating knowledge and critical understanding and the ability to share and explain this to the academic team.

As the students complete their twelve award bearing modules (120-credits), they are expected to engage in discussions with the academic team and propose a research project in consultation with the Course Director and Thesis module leader to discuss how the proposed work addresses ILOs 10-15 inclusive. It is expected by that stage, that the students will be more self-directed in their learning during this phase, while still consult with the academic team as necessary. The Thesis is assessed by a viva whereby the students' are expected to defend their work. The Thesis is also assessed by the Supervisor and an independent assessor. Successful completion of the MSc, leads to 200 credits (120-credits from the taught phase and 80-credits from the Thesis).

⁵ Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses <https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx>

Course modules

The following modules outline all parts of the programme leading to MSc.. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁹ (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
00	R-MAA-SS	Study Skills	Dr John Economou	20		0	N	05/09/22 A22 09/01/23 B22	05/09/22 09/01/23	07/09/22 11/01/23	N/A	AO					N/A	
03	R-MAA-AMA	Airworthiness of Military Aircraft	Miss Laura Lacey	30		10	N	28/11/22 A22 03/07/23	28/11/22 03/07/23	02/12/22 07/07/23	50	ICW ICW	100 100				27/01/23 01/09/23	07/07/23 23A

⁶ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁷ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁸ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$.

⁹ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

¹⁰ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgical reason and where each element forms part of a continuous learning and assessment experience for students.

¹¹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹² Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: PA – Peer Assessment; AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁹ (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
								B22										
04	N-SAI-ISMS	Aviation Safety Management	Dr Simon Mitchell Mr David Barry	30		10	Y	12/09/22 A22 27/03/23 B22	12/09/22 27/03/23	16/09/22 31/03/23	50 50	ICW ICW	100 100				14/11/22 30/05/23	AY23/24
05	N-AW-ATEMO	Air Transport Engineering – Maintenance Operations	Dr Cenqiz Turkoglu	30	0	10	Y	13/02/23	13/02/23	17/02/23	50	ICW	100				17/04/23	AY23/24
06	N-HFS-AAI	Aircraft Accident Investigation and Response	Dr Leigh Dunn	30		10	Y	17/04/23	17/04/23	21/04/22	50	ICW	100				19/06/23	AY23/24
07	R-MAA-AS	Aircraft Survivability	Mr Ioannis Vagias	35		10	N	13/03/23	13/03/23	17/03/23	50	ICW	100				12/05/23	AY23/24
08	N-AW-ICAS	Design Durability and Integrity of Composite	Dr Y Xu	35		10	Y	10/07/23 A22	10/07/23	14/07/23	50	ICW	100				11/09/23	AY23/24

Assessment Types: PA – Peer Assessment; AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁹ (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
		Aircraft Structures																
09	N-AW-FAEC	Fundamentals of Aircraft Engine Control	Dr Ioannis Goulous	30		10	Y	06/03/23	06/03/23	10/03/23	50	ICW	100				08/05/23	AY23/24
11	R-MAA-GW	Guided Weapons	Dr David Galvao Wall	32		10	Y	16/01/23 A22	16/01/23	20/01/23	50	ICW	100				17/03/23	AY23/24
								02/05/23 B22	02/05/23	05/05/23	50	ICW	100				23/06/23	AY23/24
12	N-AEN-ASC	Introduction to Aircraft Structural Crashworthiness	Dr Hessam Ghasemnejad	20		10	Y	21/02/22	21/02/22	25/02/22	50	ICW	100				25/04/22	AY23/24
13	R-MAA-IHF	Introduction to Human Factors	Miss Laura Lacey	40		10	Y	05/06/23	05/06/23	09/06/23	50	ICW	100				04/8/23	AY23/24
14	N-AW-MIGT	Mechanical Integrity of Gas Turbines	Dr Panagiotis Laskaridis	30		10	Y	03/04/23	03/04/23	07/04/23	50	ICW	100				05/06/23	AY23/24
15	R-MAA-MAS	Military Aircraft Systems	Dr John Economou	35		10	Y	12/06/23	12/06/23	16/06/23	50	ICW	100				11/08/23	AY23/24

Assessment Types: PA – Peer Assessment; AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁹ (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
16	R-MAA-MA	Military Avionics –STA, Communications and Navigation	Dr Alessio Balleri	32		10	Y	23/01/23	23/01/23	27/01/23	50	ICW	100				24/03/23	AY23/24
17	N-AW-RA	Practical Reliability	Dr Simon Place	30	10	10	Y	16/01/23	16/01/23	20/01/23	50	ICW	100				20/03/23	AY23/24
18	N-AW-SAAS	Safety Assessment of Aircraft Systems	Jeremy Turner	35	15	10	Y	07/11/22 A22	07/11/22	11/11/22	50	ICW	100				23/01/23	AY23/24
								19/06/23 B22	19/06/23	23/06/23	50	ICW	100				21/08/23	AY23/24
19	R-MAA-THESIS	Research Project	Dr Alistair Saddington	20		80	N	05/09/22 A22	05/09/22	05/09/22	50	THESIS	80				06/03/24	The following academic year
								07/12/22 B22	07/12/22	07/12/22	50	OR	20				05/06/24	
								06/03/23 C22	06/03/23	06/03/23							06/09/24	
								05/06/23 D22	05/06/23	05/06/23							04/12/24	

Assessment Types: PA – Peer Assessment; AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁹ (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹¹	Assessment Submission and/or exam date ¹²	Assessment / Exam Retake date
20	R-MAA-FAE	Aeronautical Engineering Fundamentals - Top Up	Prof Kevin Knowles	6		10	N	08/09/22	08/09/22	08/09/22	50	ICW	100				07/11/22	AY23/24
21	R-MAA-FWA	Fixed-Wing Aeromechanics	Prof Kevin Knowles	33		10	N	03/10/22	03/10/22	07/10/22	50	EX	100				07/11/22	AY22/23
22	R-MAA-PS	Propulsion Systems	Dr Alistair Saddington	28		10	N	14/11/22	14/11/22	18/11/22	50	EX	100				09/01/23	AY23/24
23	R-MAA-RWA	Rotary-Wing Aeromechanics	Prof Kevin Knowles	32		10	N	17/10/22	17/10/22	21/10/22	50	EX	100				21/11/22	AY23/24
24	N-AW-AFDT	Aircraft Fatigue and Damage Tolerance	Dr Wenli Liu	30		10	Y	12/06/23	12/06/23	16/06/23	50	ICW	100				14/08/23	AY23/24
25	N-HFS-HFAM	Human Factors in Aviation Maintenance	Dr Cenqiz Turkoglu	30		10	Y	27/03/23	27/03/23	31/03/23	50	ICW	100				30/05/23	AY23/24
26	R-MAA-UAS	Uninhabited Aircraft Systems/Remotely Piloted Aircraft Systems	Dr John Economou	35		10	Y	15/05/23	15/05/23	19/05/23	50	GCW	100				14/07/23	AY23/24

Assessment Types: PA – Peer Assessment; AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
N-SAI-ISMS	MAA04: Aviation Safety Management	Safety and Accident Investigation	<ul style="list-style-type: none"> • Airworthiness • Air Transport Management • Air Transport Management (Executive) • Defence and Security (Engineering) • Military Aerospace and Airworthiness • Safety and Human Factors in Aviation
N-AW-ATEMO	MAA05: Air Transport Engineering – Maintenance Operations	Airworthiness	<ul style="list-style-type: none"> • Air Transport Management • Air Transport Management (Executive) • Military Aerospace and Airworthiness
N-HFS-AAI	MAA06: Aircraft Accident Investigation and Response	Safety and Human Factors in Aviation	<ul style="list-style-type: none"> • Airworthiness • Forensic Engineering and Science • Military Aerospace and Airworthiness
N-AW-ICAS	MAA08: Design Durability and Integrity of Composite Aircraft Structures	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Advanced Materials • Aerospace Materials • Aircraft Engineering
N-AW-FAEC	MAA09: Fundamentals of Aircraft Engine Control	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Thermal Power
N-AEN-ASC	MAA12: Introduction to Aircraft Structural Crashworthiness	Aircraft Engineering	<ul style="list-style-type: none"> • Airworthiness • Military Aerospace and Airworthiness • Safety and Accident Investigation
N-AW-MIGT	MAA14: Mechanical Integrity of Gas Turbines	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Defence and Security (Engineering)
N-AW-RA	MAA17: Practical Reliability	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Defence and Security (Engineering)

N-AW-SAAS	MAA18: Safety Assessment of Aircraft Systems	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Safety and Accident Investigation
N-AW-AFDT	MAA24: Aircraft Fatigue and Damage Tolerance	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness
N-HFS-HFAM	MAA25: Human Factors in Aviation Maintenance	Safety and Human Factors in Aviation	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Airworthiness • Safety and Accident Investigation
R-MAA-GW	MAA11: Guided Weapons	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Military Vehicle Technology and Gun Systems Design • Defence Security Programme
R-MAA-MAS	MAA15: Military Aircraft Systems	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Airworthiness • Defence Security Programme
R-MAA-IHF	MAA13: Introduction to Human Factor	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Defence Security Programme
R-MAA-UAS/RPAS	MAA26: Uninhabited Aircraft Systems / Remotely Piloted Aircraft Systems	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Defence Security Programme
R-MAA-MA	MAA16: Military Avionics – STA, Communications and Navigation	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Weapon Vehicle Systems Programme

8. How are the ILOs assessed?

The following assessment types are utilised:

The assessment of candidates is based upon a combination of examinations, coursework assignments, and, for masters' course students, a research-based dissertation and a viva voce examination. Details of the precise methods of assessment for each module are included in the Module Descriptors and are summarized in the Course Specification.

The PgCert uses a mixture of written examinations and coursework assignments, which are designed to assess the understanding and application of the core elements of aerospace engineering and airworthiness.

In the PgDip the emphasis is on developing the understanding over a broader range of topics and to a greater depth of analysis. Students are encouraged to adopt a more holistic approach to their understanding and application of the engineering and management theories, concepts, applications and practices associated with military aerospace and airworthiness. Assessment methods include written examinations, technical essays and reports, analytical work, computer-based exercises and group activities.

To complete the course to the award of an MSc qualification, students must complete a research-based project. The project is assessed through a combination of an examination of the student's written dissertation and a viva voce examination. Suggestions for projects may come from a variety of sources: an individual student's sponsor, a member of the Cranfield academic staff, or the wider aerospace community, for example.

The project may be conducted at the student's place of work under the day-to-day supervision of their employer and the overall supervision of one or more members of the Cranfield academic staff.

This approach has been adopted because it provides a balanced approach to the overall course assessment.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
00						
03	ICW				ICW	
04	ICW		ICW			
18	ICW					ICW
20		ICW		ICW		
21	EX/ICW	ICW		EX/ICW		
22	EX/ICW	ICW		EX/ICW		

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 8	ILO 9
05	ICW		
06		ICW	ICW
07		ICW	
08		ICW	

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Award ILOs Module No.	ILO 7	ILO 8	ILO 9
09		ICW	ICW
11		ICW	ICW
12	ICW		ICW
13	ICW	ICW	
14	ICW	ICW	
15	ICW	ICW	ICW
16		ICW	ICW
17	ICW		ICW
23	ICW,EX	ICW,EX	
24	ICW		ICW
25	ICW		ICW
26		GCW	GCW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15
19	THESIS OR	THESIS OR	OR	THESIS	THESIS	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

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Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course will equip graduates with the knowledge and skills necessary for them to work effectively within MOD and the defence industry in areas of military aerospace technology, airworthiness and safety. This will open up opportunities to work in integrated project teams on matters of equipment

Military Aerospace and Airworthiness course specification: Version 1 August 2020

procurement, support and maintenance and contribute effectively with customers and suppliers. In addition, the qualification obtained will support their professional development towards Incorporated or Chartered Engineer status. The students on the course are all employed in the defence sector and are generally taking the course as CPD.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: September 2022

A. What is the course?

Course information

Course Title	Military Electronic Systems Engineering Including: Communications Electronic Warfare PgCert Sensors Electronic Warfare PgCert Military Electronic Systems Engineering Foundations PgCert
Course code	MSMESFTR, PDMESFTR, MSMESPTR, PDMESPTR – PCCEWPTR – PCSEWPTR – PCMESFTR – PCMESPTR – SPMESPTR
Academic Year	2022/23
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time (not for PG Certs in Sensors or Communications Electronic Warfare) and Part-time (for all awards)
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Electronic Warfare and Information Centre (EWIC)
Course Director	Dr David James
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements: additionally, an IELTS score of 7.0 is usually required by students for whom English is not a first language
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full time registration is for 1 year A part time student who registers for the PgCert will have a registration period of 3 years. For the PgDip this will be 4 years, and for the MSc 5 years.
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by School of Defence and Security and largely by staff within the Electronic Warfare Centre, where the research interests include electro-magnetic systems and devices, radar systems and radar development, communications principles and networks, electro-optics including seekers, laser systems and image processing

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

B. What are the aims of the course?

Cranfield University offers this MSc course in order to provide education and training in selected electronic military systems. The main object of the course is to bring together the wide variety of disciplines involved and present them in an integrated manner, emphasising the system aspects.

The formal aims of the course are as follows:

- The aim of the Postgraduate Certificates is to provide students with the skills required to analyse, compare and investigate the performance of military EW systems.
- In addition, the MSc course enables the student to carry out an in-depth investigation into an area of electronic warfare to further enhance their understanding through to the design and testing of a military EW system
- Successful graduates of this course should be fully equipped for roles in defence intelligence, EW systems development and acquisition, involving the specification, analysis and formulating recommendations for such systems.

This programme is intended for the following range of students:

Officers of the armed forces and for scientists and technical officers in government defence establishments and the defence or related industry. It is particularly suitable for those who, in their subsequent careers, will be involved with the specification, analysis, development, technical management or operation of military radar, electro optics, communications, or information systems, where the emphasis is on an electronic warfare environment.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs)

A. Postgraduate Certificate in Communications Electronic Warfare & Postgraduate Certificate in Military Electronic Systems Engineering Foundations

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Analyse a communications system
- ILO 2. Compare, contrast and explain the trade-offs in the development and use of a communications system
- ILO 3. Identify the key parameters impacting on a communications system performance
- ILO 4. Investigate the performance of a communication system.

B. Postgraduate Certificate in Sensors Electronic Warfare

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 5. Analyse a military sensor system
- ILO 6. Compare, contrast and explain the trade-offs in the development and use of a sensor system
- ILO 7. Identify the key parameters impacting on sensor performance
- ILO 8. Investigate the performance of a sensor system.

C. Postgraduate Certificate in Military Electronic Systems Foundations

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 9. Analyse a military electronic system
- ILO 10. Compare, contrast and explain the trade-offs in the development and use of a communications or sensor system
- ILO 11. Identify the key parameters impacting on system performance
- ILO 12. Investigate the performance of a military EW system.

D. Postgraduate Diploma in Military Electronic Systems Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 13. Evaluate the effectiveness of a military electronic warfare system;
- ILO 14. Assess and make recommendations regarding the desirable parameters of an electronic warfare system and be able to justify decisions.

E. MSc in Military Electronic Systems Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 15. Demonstrate self-direction and originality in developing and delivering successful independent research into military EW or a military EW device, system or concept.

ILO 16. Develop and evaluate informed judgements regarding EW and propose suitable hypotheses and appropriate analysis in order to draw required conclusions.

All of the course level ILOs are summarised in the following table

ILO	PGCert			PG Dip MESE	MSc MESE
	Comms EW	Sensor EW	MESE Foundations		
1. Analyse a communications system	X			x	X
2. Compare, contrast and explain the trade-offs in the development and use of a communications system	X			X	X
3. Identify the key parameters impacting on a communications system performance	X			X	X
4. Investigate the performance of a communication system.	X			X	X
5. Analyse a military sensor system		X		X	X
6. Compare, contrast and explain the trade-offs in the development and use of a sensor system		X		X	X
7. Identify the key parameters impacting on sensor performance		X		X	X
8. Investigate the performance of a sensor system.		X		X	X
9. Analyse a military electronic system			X	X	X
10. Compare, contrast and explain the trade-offs in the development and use of a communications or sensor system			X	X	X
11. Identify the key parameters impacting on system performance			X	X	X
12. Investigate the performance of a military EW system.			X	X	X
13. Evaluate the effectiveness of a military electronic warfare system;				X	X
14. Assess and make recommendations regarding the desirable parameters of an electronic warfare system and be able to justify decisions.				X	X
15. Demonstrate self-direction and originality in developing and delivering successful independent research into EW or a military EW device, system or concept					X
16. Develop and evaluate informed judgements regarding EW and propose suitable hypotheses and appropriate analysis in order to draw required conclusions					X

4. How is the course taught?

The course is taught through lectures. Group tutorials and demonstrations are employed where appropriate.

In addition to the teaching methods outlined above, students may be supported in their learning and personal development by: individual tutorials and practicals where necessary and appropriate

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5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate in Communications Electronic Warfare**

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
4 Communications Principles	10
6 Communications Systems	10
10 Communications Electronic Warfare	10
12 Information Networks	10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. **Postgraduate Certificate in Sensors Electronic Warfare**

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Electro-optics and Infrared Systems I	10
5 Radar Principles	10
7 Electro-optics and Infrared Systems 2	10
9 Radar Electronic Warfare	10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

C. Postgraduate Certificate in Military Electronic Systems Engineering Foundations

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Electro-optics and Infrared Systems I	10
4 Communication Principles	10
5 Radar Principles	10
6 Communication Systems	10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

D. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Electro-Optics and Infrared Systems 1	10
4 Communication Principles	10
5 Radar Principles	10
6 Communication Systems	10
ELECTIVE MODULES:	
Modules to the value of 60 credits selected from:	
7 Electro-Optics and Infrared Systems 2	10
8 Foundations of Modelling and Simulation	10
9 Radar Electronic Warfare	10
10 Communications Electronic Warfare	10
11 Advanced Radar	10
12 Information Networks	10
13 Advanced Sensor Data Processing	10
TOTAL:	120

E. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Electro-Optics and Infrared Systems 1	10
4 Communication Principles	10
5 Radar Principles	10
6 Communication Systems	10
14 Thesis	80
ELECTIVE MODULES:	
Modules to the value of 60 credits selected from:	
7 Electro-Optics and Infrared Systems 2	10
8 Foundations of Modelling and Simulation	10
9 Radar Electronic Warfare	10
10 Communications Electronic Warfare	10
11 Advanced Radar	10
12 Information Networks	10
13 Advanced Sensor Data Processing	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course full time MSc within 48 weeks and the PgDip within 40 weeks.

This course is also offered on a part-time basis. Students would instead be permitted a maximum of 5 years to complete the MSc, 4 years to complete the Diploma and 3 years to complete the Certificates.

Each module is taught over one week and will be followed by a week of consolidation / coursework. The weeks preceding and following the taught week are normally free of structured teaching timetabling permitting.

7. Course Level Assessment Strategy

Military Electronic Systems Engineering is a multidisciplinary programme covering the areas of electro-optics, communications, radar, electronic warfare and information networks. The course covers the fundamental physics through to system design and performance.

The modules cover a range of disciplines and it is not possible for different modules to target specific ILOs. Rather, each module assesses the student on several of the ILOs, but relating to the specific content of that module.

Modules require submission of a written piece of work as a technical report or an essay. These will be of varying lengths, recognising that writing articles to a short length can be more challenging for some and can develop different skills relevant to professional practice. For all modules with the exception of Electro-Magnetic Propagation and Devices the length of each assessment task is clearly stated within the module descriptor. This allows the student to develop their critical thinking and presentation of arguments in a written mode, as well as developing their practice at presenting information in a practical and scientific way for both expert and non-expert audiences.

Through tutorials and formative feedback alongside the summative assessment, students will develop their practice in expressing complex, scientific and technical concepts clearly and succinctly in a high pressure situation. This is a relevant professional skill to many of the job roles that students go onto after completing the course.

In addition to the taught modules MSc students are required to undertake a research project the output of which takes the form of a Thesis. The assessment of this incorporates ongoing formative feedback in the form of one-to-one supervisory interactions between student and advisor, advice when writing the Thesis document and final comments from the assessors after submission.

Course modules

The following modules outline all parts of the programme leading to **MSc..** Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of Independent assessments	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
1		R-MES-EPD	Electromagnetic Propagation and Devices A22	Dr I L Morrow	32	0	10	N	05/09/22	05/09/22	16/09/22	50	ICW	100				14/10/22 (FT & PT)	TBC
2		R-MES-SPSA	Signal Processing, Statistics and Analysis A22	Dr P Barker	30	0	10	Y	03/10/22	03/10/22	07/10/22	50	ICW	100				04/11/22 (FT & PT)	TBC

⁴ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁵ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁶ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.

⁷ For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education

⁸ For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear pedagogical reason and where each element forms part of a continuous learning and assessment experience for students.

⁹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁰ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
4		R-MES-CP	Communication Principles A22	Dr P Barker	30	0	10	N	31/10/22	31/10/22	04/11/22	50	ICW	100				02/12/22 (FT & PT)	TBC
6		R-MES-CS	Communication Systems A22	Dr P Barker	30	0	10	N	28/11/22	28/11/22	02/12/22	50	ICW	100				06/01/23 (FT & PT)	TBC
5		R-MES-RP	Radar Principles A22	Dr A Balleri	30	0	10	Y	14/11/22	14/11/22	18/11/22	50	ICW	100				16/12/22 (FT & PT)	TBC
8		R-AMOR-FMS Occ B	Foundations of Modelling and Simulation B22	Mr J Hoggard	32	0	10	Y	16/01/23	16/01/23	20/01/23	40	ICW	100				27/02/23 (FT & PT)	TBC
9		R-MES-REW	Radar Electronic Warfare A22	Mr I Vagias	30	0	10	Y	30/01/23	30/01/23	03/02/23	50	ICW	100				03/03/23 (FT & PT)	TBC
3		R-MES-EOIS1	Electro-optics and Infrared Systems I A22	Dr A Khalid	32	0	10	Y	17/09/22	17/10/22	21/10/22	50	ICW	100				18/11/22 (FT & PT)	TBC
7		R-MES-EOIS2	Electro-optics and Infrared Systems II A22	Dr L Chermak	32	0	10	Y	09/01/23	09/01/23	13/01/23	50	ICW	100				10/02/23 (FT & PT)	TBC
13		R-MES-ASDP	Advanced Sensor Data Processing A22	Dr V S Sastry	30	0	10	N	27/03/23	27/03/23	31/03/23	40	ICW	100				05/05/23 (FT & PT)	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Minimum Mark ⁶ - 40% or 50%	Assessment						
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date		Independent Assessment		Multi-part Assessment			Submission dates	
													Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
10		R-MES-CEW	Communications Electronic Warfare A22	Dr P Barker	30	0	10	N	13/02/23	13/02/23	17/02/23	50	ICW	100				17/03/23 (FT & PT)	TBC
11		R-MES-AR	Advanced Radar A22	Dr D Andre	30	0	10	N	06/03/23	06/03/23	10/03/23	40	ICW	100				07/04/23 (FT & PT)	TBC
12		R-MES-IN	Information Networks A&B22	Dr P Nobles	30	0	10	N	A22: 13/03/23 B22: 20/03/23	13/03/23 20/03/23	17/03/23 24/03/23	40	ICW	100				21/04/23 (FT & PT) 25/04/23 (FT & PT)	TBC
14		R-MES-THESIS	Thesis A22	Dr A Khalid	50	0	80	N	02/05/23(FT & PT)	02/05/23(FT & PT)	12/07/23 (FT & PT)	50	THESIS	100				12/07/23 (FT) 01/09/23 (PT)	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

MODULE		PgCert MESE F	PgCert CEW	PgCert SEW	PgDip MESE	MSc MESE		Marketed as short course	Joint with another MSc
1	EPD	C	C	C	C	C		NO	AERO
2	SPSA	C	C	C	C	C		YES	GWS/AERO
3	EOIS1	C		C	C	C		YES	GWS/AERO
4	CP	C	C		C	C		YES	AERO
5	RP	C		C	C	C		YES	GWS/AERO
6	CS	C	C		C	C		YES	AERO
7	EOIS2			C	E	E		YES	GWS/AERO
8	FMS				E	E		SHARED	AMOR
9	REW			C	E	E		YES	GWS/AERO
10	CEW		C		E	E		YES	
11	AR				E	E		YES	
12	IN		C		E	E		YES	AERO
13	ASDP				E	E		YES	
14	THESIS					C		NO	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRACT – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-MES-EPD	Electromagnetic Propagation and Devices	Military Electronic Systems Engineering	AeroSystems
R-MES-CP	Communication Principles	Military Electronic Systems Engineering	AeroSystems
R-MES-CS	Communication Systems	Military Electronic Systems Engineering	AeroSystems
R-MES-IN	Information Networks	Military Electronic Systems Engineering	AeroSystems
R-MES-EOIS1	Electro-optics & Infrared Systems I	Military Electronic Systems Engineering	Guided Weapon Systems/ AeroSystems
R-MES-EOIS2	Electro-optics & Infrared Systems II	Military Electronic Systems Engineering	Guided Weapon Systems/ AeroSystems
R-MES-RP	Radar Principles	Military Electronic Systems Engineering	Guided Weapon Systems/ AeroSystems
R-MES-REW	Radar Electronic Warfare	Military Electronic Systems Engineering	Guided Weapon Systems/ AeroSystems
R-MES-SPSA	Signal Processing, Statistics and Analysis	Military Electronic Systems Engineering	Guided Weapon Systems/ AeroSystems
R-AMOR-FMS B22	Foundations of Modelling and Simulation	Applied Mathematics and Operational Research	Military Electronic Systems Engineering/ AeroSystems

Modules offered to Short Course delegates.

<u>Module code</u>	<u>Module title</u>
R-MES-SPSA	Signal Processing, Statistics and Analysis
R-MES-RP	Radar Principles
R-MES-CP	Communication Principles
R-MES-EOIS1	Electro-Optics & Infrared Systems Part 1
R-MES-CS	Communication Systems
R-MES-EOIS2	Electro-Optics & Infrared Systems Part 2
R-MES-REW	Radar Electronic Warfare
R-MES-CEW	Communications Electronic Warfare

R-MES-AR	Advanced Radar
R-MES-IN	Information Networks
R-MES-ASDP	Advanced Sensor Data Processing
R-AMOR-FMS	Foundations of Modelling and Simulation

8. How are the ILOs assessed?

Students can expect their understanding to be assessed by submitted course work. The project is assessed by the student's supervisor and an internal assessor.

This approach has been adopted in order to best suit the nature of the individual modules and their content.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate in Communications Electronics Warfare

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4
1 EMPD	ICW			
2 SPSA	ICW	ICW		
4 CP	ICW	ICW	ICW	ICW
6 CS	ICW	ICW	ICW	ICW
10 CEW			ICW	ICW
12 IN		ICW		ICW

B. Postgraduate Certificate in Sensors Electronic Warfare

Award ILOs Module No.	ILO 5	ILO 6	ILO 7	ILO 8
1 EPD	ICW			
2 SPSA	ICW	ICW		
3 EOIS1	ICW	ICW	ICW	ICW
5 RP	ICW	ICW	ICW	ICW
7 EOIS2	ICW	ICW	ICW	ICW

Award ILOs Module No.	ILO 5	ILO 6	ILO 7	ILO 8
9 REW		ICW	ICW	ICW

C. Postgraduate Certificate in Military Electronic Systems Engineering Foundations

Award ILOs Module No.	ILO 9	ILO 10	ILO 11	ILO 12
1 EPD	ICW			
2 SPSA	ICW	ICW		
3 EOIS1	ICW	ICW	ICW	ICW
4 CP	ICW	ICW	ICW	ICW
5 RP	ICW	ICW	ICW	ICW
6 CS	ICW	ICW	ICW	ICW

D. Postgraduate Diploma in Military Electronics Systems Engineering (Students select 2 modules from those listed)

Award ILOs Module No.	ILO 13	ILO 14
8 FMS	ICW	ICW
11 AR	ICW	ICW
13 ASDP	ICW	ICW

E. MSc in Military Electronic Systems Engineering

Award ILOs Module No.	ILO 15	ILO 16
14 THESIS	THESIS	THESIS

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Successful graduates of this course should be fully equipped for roles in defence intelligence, systems development and acquisition, involving the specification and analysis of such systems, working individually or as part of a team either in the military or in the defence industry.