# L7 DIGITAL AND TECHNOLOGY SOLUTIONS SPECIALIST (INTEGRATED DEGREE)

**John Ahmet Erkoyuncu**

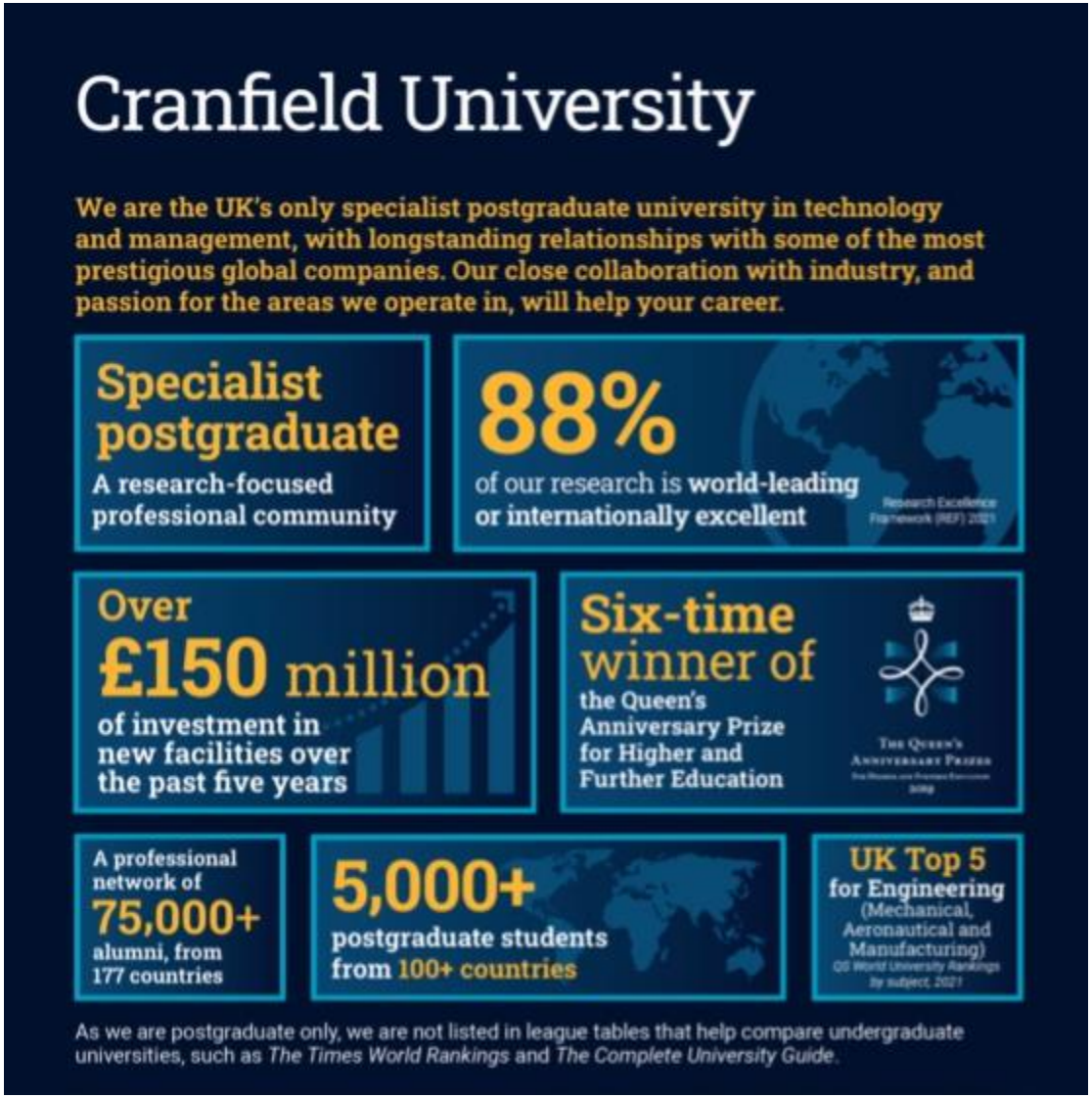
**Professor of Digital Engineering**

**E: j.a.erkoyuncu@cranfield.ac.uk**

**T: +44 (0) 1234 754717**

www.cranfield.ac.uk

# Cranfield University


Cranfield University
We are the UK's only specialist postgraduate university in technology and management, with longstanding relationships with some of the most prestigious global companies. Our close collaboration with industry, and passion for the areas we operate in, will help your career.
Specialist postgraduate
A research-focused professional community
88%
of our research is world-leading or internationally excellent
Research Excellence Framework (REF) 2021
Over £150 million
of investment in new facilities over the past five years
Six-time winner of
the Queen's Anniversary Prize for Higher and Further Education
The Queen's Anniversary Prizes
A professional network of 75,000+ alumni, from 177 countries
5,000+
postgraduate students from 100+ countries
UK Top 5
for Engineering
(Mechanical, Aeronautical and Manufacturing)
QS World University Rankings by subject, 2021
As we are postgraduate only, we are not listed in league tables that help compare undergraduate universities, such as *The Times World Rankings* and *The Complete University Guide*.

# Led by Centre for Digital Engineering and Manufacturing

- **Digitalisation** of through-life manufacturing: data mining, ontologies, NDT, robotics, additive manufacturing, etc.
- **Complex systems and optimisation**: data analytics, risk and uncertainty quantification, physics based modelling, adaptive simulation, life cycle simulations.
- **Digital twins and AI**: digital twins, AI and autonomous systems, cyber security, IoT, cloud computing, blockchain.
- **Virtual and augmented reality**: adaptive visualisation, dynamic content creation, digital work instructions, innovative training.

# L7 Master level apprenticeship (Mastership)

W: https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-specialist-(integrated-degree)-v1-0

**Investigating, identifying and implementing technological strategic solutions.**

## Details of standard

### Role Profile

A Digital & Technology Solutions Specialist maintains digital and technology strategies through technology leadership; investigating, identifying and implementing technological strategic solutions. They direct digital technology provision by studying organisation goals, strategies, and practices and delivering and supporting strategic plans for implementing digital technologies. They are confident, competent and capable individuals able to apply leadership and change management skills to operate in a range of digital and technology related specialist roles. This standard is based upon a core set of knowledge, skills and behaviours that will be supplemented by one specialism detailed below.

### Entry Requirements

Individual employers will set the selection criteria, but this is likely to include a degree at 2.1 or higher in a relevant subject, although some employers will accept other relevant qualifications or experience.

**Level:** 7

Degree: integrated degree

**Reference:** ST0482

**Version:** 1.0

**Approved for delivery:** 7 August 2018

**Route:** Digital

**Typical duration to gateway :** 18 months (this does not include EPA period)

**Maximum funding:** £21000

**Options:** Cyber Security Technical Specialist, Data Analytics Specialist, Digital Business & Enterprise Systems Architecture Specialist, IT / Digital Futures Management Specialist, IT Business Analysis Specialist, IT Operations Management Specialist, IT Project Management Specialist, IT Strategy Specialist, Network Engineering Specialist, Software Engineering Specialist, System Test & Assurance Specialist

# Extensive industrial engagement

- Industrial partners through workshops and interviews
- Team Defence Information – Digital Twins Special Interest Group
- Defence Growth Partnership














# Course overview

**Aim:**

The Digital and Technology Solutions MSc programme takes a holistic view to offer awareness and hands-on practical knowledge to design and develop digital technologies and solutions (including AI/Machine learning, digital twins, AR/VR, data analytics, data management) across industries that rely on complex engineered products and services.

**Targeting both apprenticeship and non-apprenticeship students:**

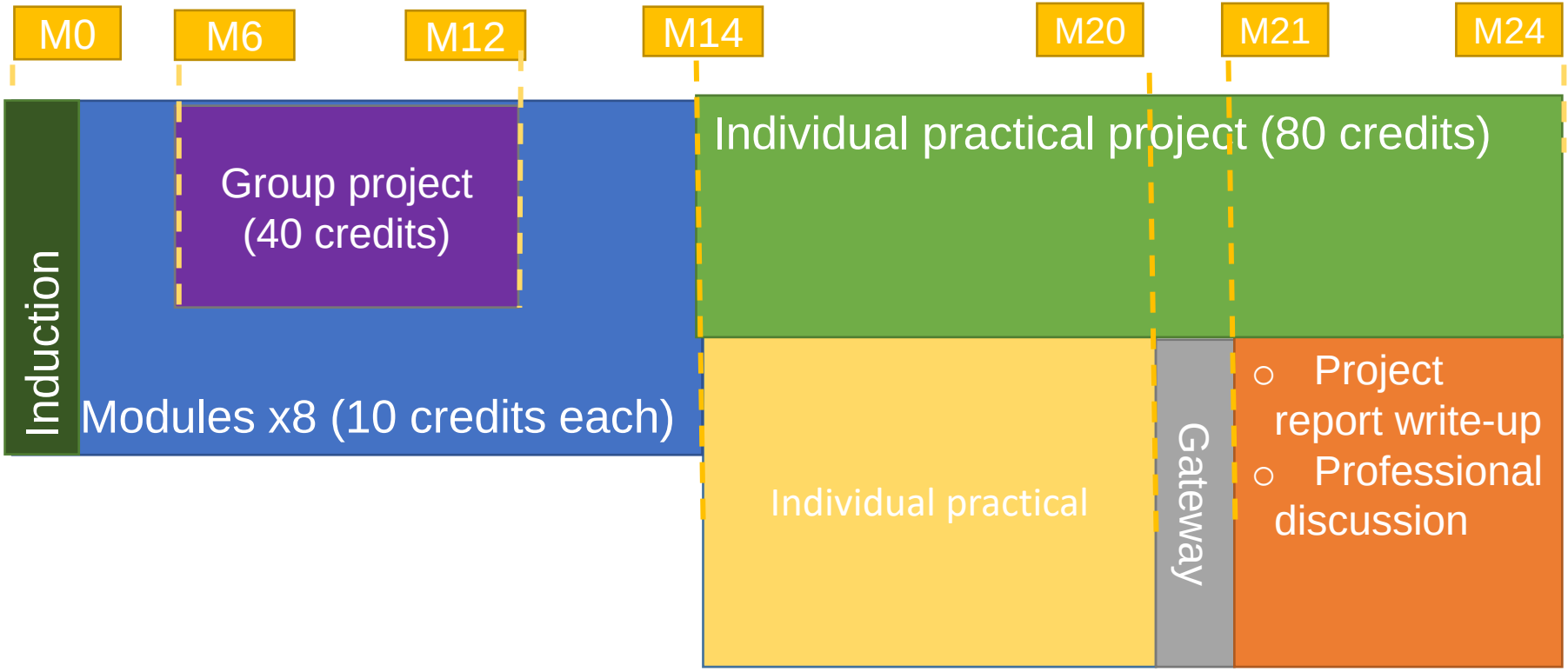
- Experienced professionals who are seeking or are invited to take on senior leadership roles within manufacturing or related sectors.
- Early and mid-career professionals who want a “real-world” education that they can apply directly to their workplace.
- Second career professionals seeking a change into manufacturing/maintenance related or digitally driven organisation.

# Specialism occupations

A Digital and Technological Solutions Professional will choose one of the following technical specialisms:

- **Data analytics specialist**
- **Digital business and enterprise systems architecture specialist**
- **[Software engineering specialist]**
- **[System test and assurance specialist]**
- **[IT business analysis specialist]**
- IT strategy specialist
- Network engineering specialist
- IT operations management specialist
- IT project management specialist
- Cyber security technology specialist
- IT / digital futures management specialist

# MSc timeline



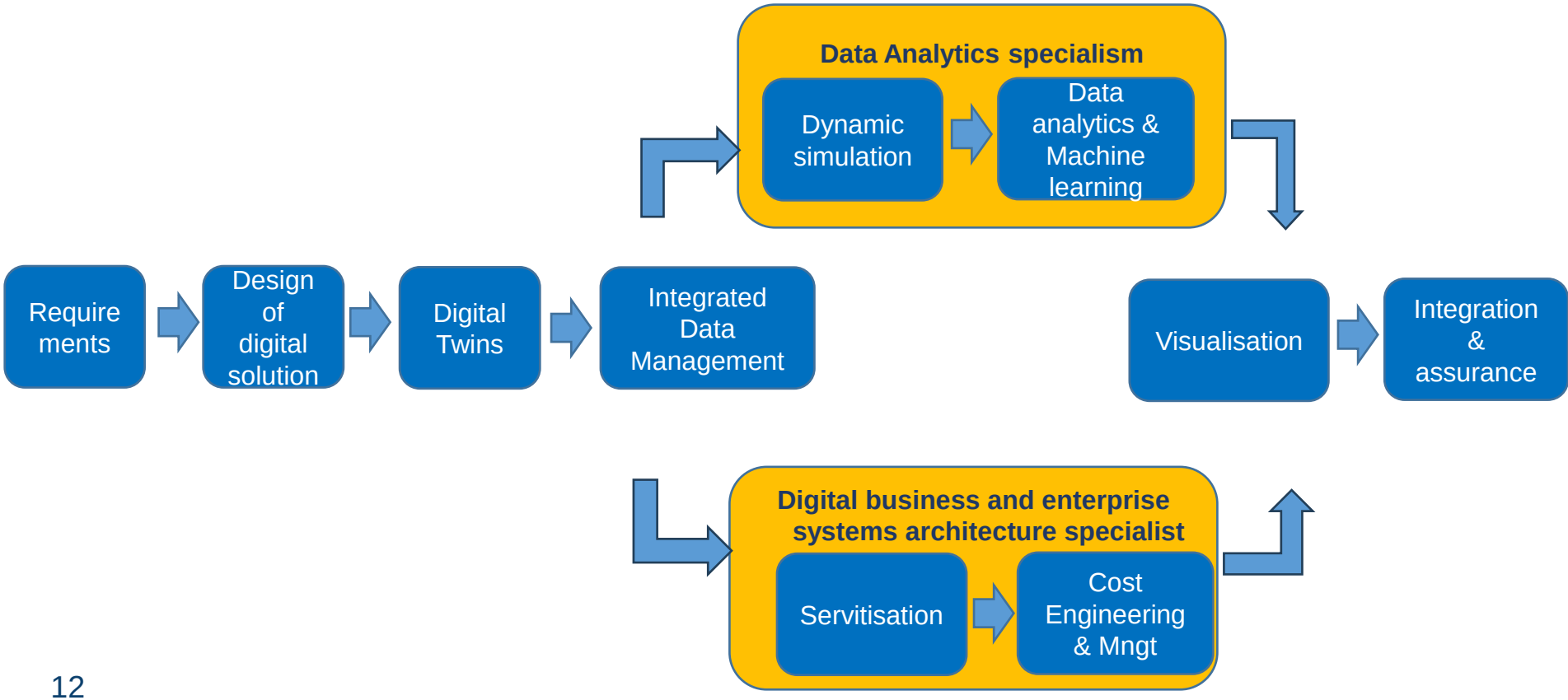

**Part-time study** (typically 2 years)

# Approach to delivery

- Induction – face to face delivery
- Modules
  - Each module will be designed for delivery through problem-based learning
  - Digital demonstrator developed throughout the modules
  - Modules 1 and 8 delivered face to face
  - Modules 2-7 delivered remotely
  - Between modules 2-7 face to face meet-ups arranged at sponsor organisations+
- Group Project
  - Focused on creating a digital demonstrator within groups of 4-6
- Individual Practical Project
  - Focused on creating a digital demonstrator

# Course themes

- Course structure follows a digitalisation journey with practical work



# Overview of core modules

| 1. Introduction to Digital Engineering | 2. Digital Business & Enterprise Systems | 3. Digital Twins | 4. Integrated Data Management |
|---|---|---|---|
| Requirements capture | Design thinking | Design | Introduction to programming |
| Systems engineering and MBSE | Process mapping | Delivery and resilience | Data needs analysis |
| Awareness and justification of digital technologies | Governance models, and project management | Cyber security | Data sources – people, sensors, 5G, IoT |
| ROI | Interoperability and through-life systems thinking | Blockchains | Connectivity of data |
| Digitisation vs digitalisation vs digital transformation | Human in the loop | Realising added value | Data structures and modelling – ontologies, and reference architectures |

# Modules based on Specialism

| Data analytics specialist | | Digital business and enterprise systems architecture specialist | |
|---|---|---|---|
| **5.1 Digital Business Analysis** | **6.1 Data analytics and Artificial Intelligence** | **5.2 Digitally Enabled Servitisation** | **6.2 Digitalisation of Cost Engineering** |
| Dynamic simulation | Statistical analysis | Compare and contrast alternative contractual options | Appraise value from cost engineering |
| Root cause analysis and risk management | AI and ML implementation | Evaluate organisational transformation | To assess the role of data in cost engineering |
| Sensitivity analysis | Cloud based applications and super computer application | Mapping digital technologies for servitisation | Apply and critique next generation modelling, and simulation |
| Basic finance and financial/investment analysis | 5 V's | Design digitalisation of servitisation | Evaluate risk and uncertainty in cost estimates |
| Environmental sustainability analysis | Model monitoring and updates | Learn from servitisation examples | Demonstrate continuous improvement in value creation |

# Overview of core modules – cont.

| 7. Adaptive visualisation | 8. Digital integration and Systems Testing |
|---|---|
| Design of visualisation methods | Integrated demonstration |
| Human-machine interface | Test management |
| Technical communication skills | Standards and assurances |
| Dashboards | Test case and scenario development |
| Virtual and augmented reality | Safety evaluation and mission assurance |

# Group project (40 credits)


- Working digital demonstrator
  - Applied project
  - Solving an industrial problem
  - Integrating learning from modules
  - Research driven to justify and critique the developed solution
  - Assessment based on the developed demonstrator and presentation
- Assessment focused on the demonstrator and presentation

# Individual Practical project (80 credits)

Individual research between Month 14-20

- Practical research to address real life challenges.

End Point Assessment between Month 21-24 and assessed as follows:

# Registration

- Next cohort start in October 2024
- Registration and further information at:
- https://www.cranfield.ac.uk/courses/taught/digital-technology-solutions-apprenticeship
- Tuition fee covered through the apprenticeship levy for those eligible.

# Thank you!

Prof. John Erkoyuncu

E: j.a.erkoyuncu@cranfield.ac.uk