UK

SYLLABUS 2025-2026

Elective: Digital Transformation and 4.0 Industry

MODULE SPECIFICATION

Module Code	2526_TFB_1_EN_008
Campus	Oxford
Department(s)	Tech for Business
Level / Semester	Undergraduate Year 3 (U3); Equivalent to FHEQ level 6 Semester 06
Language of Instruction	English
Teaching Method	☒ In-person (face-to-face) ☐ Distance learning (live online) ☐ e-Learning (asynchronous) ☐ Hybrid: _____
Pre-requisite(s)?	None
ECTS *Reminder: 1 ECTS = between 20 and 30hr- student workload*	3
Equivalent FHEQ credits	6
Study Hours	60 hours which comprise of 30 directed learning and 30 independent learning/assessment hours

MODULE DESCRIPTION

Module Aims	Students explore the phases and strategic implications of digital transformation within organisations. The module covers key technologies of Industry 4.0 and examines the organisational and human factors influencing adoption. Emphasis is placed on designing structured transformation strategies to support innovation and performance.

Teaching Arrangement	The module is delivered through a blended learning approach, including face-to-face lectures with exercises and use cases and e-learning with a MOOC is recommended (+certification).
Learning Outcomes	By the end of this module, students should be able to: 1. Evaluate the key stages of digital transformation and their strategic implications for businesses. 2. Develop a structured digital transformation strategy, identifying key phases and implementation challenges. 3. Assess the technological foundations of Industry 4.0, including AR/VR, additive manufacturing, and robotics. 4. Analyse the human and organisational challenges of digital transformation and propose solutions to support successful adoption.
Competency Goals *(Knowledge, expertise and interpersonal skills)*	PGE_U_CG07 - Improve performance through digitalisation
Alignment with Programme Learning Goals	PGE_U_CG07_LO01 - Lead a digital transformation initiative
	PGE_U_CG07_LO02 - Protect data and make data-driven decisions

SESSION TOPICS / MODULE SCHEDULE

(Please note, a session/sequence may be more than one scheduled class)

Session 1: Introduction to Digital Transformation

Content:

- Introduction to the module plan and continuous assessments
- What is digital transformation?
- What are the business drivers for digital transformation?
    - Business process
    - Business model
- What are the main steps?
- Concept, design, prototype, validation, test
- Manufacturing pilot and ramp
- How to set it up?
- Measuring the value of transformation

Assignments:

- Read:
    - Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0*. Packt Publishing. (Chapter 1)
    - Kane, G.C., Phillips, A.N., Copulsky, J.R. and Andrus, G.R. (2019) *The technology fallacy: How people are the real key to digital transformation*. MIT Press. (Chapter 1)

Session 2: Accompany the Transformation

Last reviewed: 05/08/2025

Content:

- Transform the organisation's culture
  - The agile method
  - The lean method
- New work organisations
- New jobs
- Skills and capabilities for digital transformation

Assignments:

- Read:
  - Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0*. Packt Publishing. (Chapter 2)
  - Kane, G.C., Phillips, A.N., Copulsky, J.R. and Andrus, G.R. (2019) *The technology fallacy: How people are the real key to digital transformation*. MIT Press. (Chapter 2)

Session 3: Main Difficulties and Risks of Digital Transformation

Content:

- Lack of expertise
- Funding
- Legacy business model
- Organisational structure
- Lack of overall digitisation strategy
- Employee pushback
- Outdated processes
- Lack of automation
- Overcoming challenges (some examples)
- Pitfalls to avoid in digital transformation
- How to ensure success in digital transformation

Assignments:

- Read: Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0*. Packt Publishing. (Chapter 4)

Session 4: Emerging Capabilities to Accelerate Digital Transformation

Content:

- The need for new digital capabilities
- Digital transformation in former industries
  - Industrial manufacturing
  - Chemical industry
  - Building (smart building)
  - Consumer products
  - Finance and bank
  - Tourism
  - Health
  - Entertainment

Assignments:

- Read: Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital*

transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0. Packt Publishing. (Chapter 3)

Session 5: Roleplay (Part 1)

Content:

- Consulting roleplay
    - Groups of 3 students – each group will have to defend its opinion

Session 6: Roleplay (Part 2)

Content:

- End of consulting roleplay

Sessions 7 & 8: Digital Transformation in Industry, Thanks to Technology [taught over 2 teaching sessions]

Content:

- Industry landscape of emerging technologies:
    - AI
    - Big data
    - Robotics
    - AR/VR
    - 3D printing
    - Digital twins
    - Types of maintenance
    - Supply chain
    - Digital platforms

Assignments:

- Read: Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0.* Packt Publishing. (Chapter 3)

Session 9: VR/VA Workshop

Content:

- Workshop on Virtual Reality (VR) and VA

Session 10: 3D Printing and Digital Twin Workshop

Content:

- Workshop on 3D printing and digital twins

Session 11: AI and Big Data Workshop

Content:

- Workshop on AI and big data

Session 12: Robotics Workshop and Revision

Content:

- Workshop on robotics
- Revision

KEY TEXTS

1. Nath, S.V., Dunkin, A., Chowdhary, M. and Patel, N. (2020) *Industrial digital transformation: Accelerate digital transformation with business optimization, AI, and Industry 4.0*. Packt Publishing.
2. Saldanha, T. (2019) *Why digital transformations fail: The surprising disciplines of how to take off and stay ahead*. Oakland, CA: Berrett-Koehler Publishers.

SUPPLEMENTARY TEXTS

1. Kane, G.C., Phillips, A.N., Copulsky, J.R. and Andrus, G.R. (2019) *The technology fallacy: How people are the real key to digital transformation*. MIT Press.

MODES OF ASSESSMENT

Continuous Assessment (40% - equal weighting between assessments)	Written exam
	Open book case study
	Group presentation
Final Exam (60%)	Closed book written exam

MODULE DESIGN TEAM

- Author: *Robin Pote*
- Reviewer: *David Oparah*
- External Reviewer: *Julian Michael Berry*

Last reviewed: 05/08/2025