ISM UNIVERSITY OF MANAGEMENT AND ECONOMICS

APPROVED BY
THE STUDY COMMISSION
Minutes No. 02-12-2026-07
as of 10th March 2026

# EXPONENTIAL TECHNOLOGIES AND ETHICS

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| **Course code** | *MNG249* |
| **Compulsory in the programmes** | *Entrepreneurship and Innovation* |
| **Level of studies** | *Undergraduate* |
| **Number of credits** | *3 ECTS; 12 academic hours of lectures, 12 hours of seminars, 55 hours of individual work, 3 hours of consultation* |
| **Course coordinator** | *Assoc. prof. Dr. Bahman Peyravi* |
| **Course prerequisites** | *None* |
| **Language of instruction** | *English* |

## COURSE DESCRIPTION

The course will enable students to critically analyse and explore exponential, disruptive, and breakthrough technologies that are transforming business, industries, and society. Students will develop the ability to identify emerging technologies, evaluate their commercial and societal potential, and assess their strategic implications for organizations operating in rapidly changing environments. The course will emphasize trend-driven innovation and future-oriented strategic thinking. Students will learn how organizations scout, forecast, and manage emerging technologies using tools such as horizon scanning, scenario planning, weak signal analysis, and technology roadmapping. They will analyse how companies experiment with innovation under uncertainty and how agile, data-driven, and AI-supported decision-making processes are changing management and entrepreneurship.Special attention will be devoted to ethical, societal, and sustainability-related implications of exponential technologies. Students will critically examine issues related to AI ethics, algorithmic bias, digital inequality, cybersecurity, privacy, misinformation, human augmentation, and responsible innovation.

## AIM OF THE COURSE

The main aim of the course is to provide students with knowledge and critical understanding of exponential and emerging technologies, and their application in the development of innovative, sustainable, and AI-driven digital businesses. The course explores how contemporary technologies — such as artificial intelligence, generative AI, robotics, blockchain, extended reality (XR), quantum computing, IoT, and advanced data analytics — are transforming industries, organizations, entrepreneurship, and society.

## MAPPING OF COURSE LEVEL LEARNING OUTCOMES (OBJECTIVES) WITH DEGREE LEVEL LEARNING OBJECTIVES (See Annex), STUDY AND ASSESSMENT METHODS

| Course level learning outcomes (objectives) | Degree level learning objectives (Number of LO) | Study methods | Assessment methods |
|---|---|---|---|
| CLO1. To be able to define the exponential technologies | LO 2 | Individual study<br>Reflection and discussions | Final exam |
| CLO2. To be able to critically evaluate exponential technologies and its importance to the digital business and innovation activities | LO 2 | Group project<br>Practicing, reflecting, and discussions | Group task, and individual reflection |
| CLO3. To able understand digital technologies ecosystem and its role in business development | LO 2, LO 4 | Individual study<br>Practicing, reflecting, and discussions | Final exam, group task, and individual reflection |
| CLO4. To be able to identify and analyse technology trends and emerging technologies and impact on society | LO 2 | Group project | Group task, and individual reflection |
| CLO5. Will be able to understand ethical implications of exponential technologies and will be able to create sustainable and responsible technological business | LO 2 | Individual study<br>Practicing, reflecting, and discussions | Final exam and individual reflection |

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| CLO6. Develop critical thinking ability and problem-solving skills through experiential learning. | LO 16 | Lectures, seminars, group project | Exam, reflection, and feedback on other groups research projects |

**LEARNING METHODS**

In this course students will be encouraged to use future prediction articles and reports and will be encouraged to identify possible technology scenarios. Students will be able to create innovative exponential technology analytical projects by visiting companies and interviewing experts. Students will create innovative video projects, which reflects exponential technologies applications.

**CHEATING ISSUES**

The teaching and testing methods are chosen taking into account the purpose of the minimization of cheating opportunities. The ISM regulations on academic ethics will be fully applied in the course.

| Topic | In-class hours | Readings |
|---|---|---|
| 1. Foundations of exponential change. Law of Accelerating Returns; Moore-class and post-Moore trajectories; deceptive vs. disruptive phase of exponentials; the 6 Ds (Diamandis); information patterns underlying technological civilisation. | 2 | Kurzweil, R. (2024). The Singularity is Nearer, chs. 1–2. Harari, Y. N. (2024). Nexus, Part I.<br>Diamandis & Kotler (2020). The Future is Faster than You Think, chs. 1–3. |
| 2. Frontier AI and generative models. Foundation models, scaling laws, multimodality, agentic systems. Capabilities, limits, and emergent behaviours. The path toward AGI: claims, evidence, and uncertainty. | 2 | Suleyman, M. (2023). The Coming Wave, chs. 4–6.<br>Bommasani et al. (2021/updated). On the Opportunities and Risks of Foundation Models (Stanford CRFM).<br>Stanford HAI (2025). AI Index Report.<br>Bengio, Y. et al. (2024). Managing AI risks in an era of rapid progress. Science.run the world. Harvard Business Review Press. |
| 3. Trend-driven innovation and technology scouting. Identifying weak signals; trend canvas methods; convergence mapping; horizon scanning; building an organisational scouting capability. | 2 | Webb, A. (2016). The Signals are Talking, chs. 1–4. Mason, H., & Mattin, D. (2018). Trend-Driven Innovation, selected chapters. Frick, L. & Hadeed, A. (updated edition). Trend Hunting in Practice. |
| 4. Technology disruption cycles. Christensen disruption theory revisited; Gartner Hype Cycle; S-curves and substitution; why incumbents miss exponential shifts. | 2 | Christensen, C. M. (1997, repr. 2016). The Innovator's Dilemma, selected chapters. Gartner (latest annual). Hype Cycle for Emerging Technologies. Lepore, J. (2014). The Disruption Machine. The New Yorker (counterpoint). |
| 5. The convergence stack — AI × biotech × quantum × robotics × XR. Synthetic biology; quantum advantage and post-Willow trajectories; humanoid robotics; spatial computing; brain–computer interfaces. | 2 | Doudna, J., & Sternberg, S. (2017). A Crack in Creation.<br>Mukherjee, S. (2017). The Gene, selected chapters.<br>Preskill, J. (2018/updated). Quantum Computing in the NISQ era and beyond.<br>Clark, A. (2023). The Experience Machine (predictive minds & XR). |
| 6. Exponential organisations and business-model transformation. ExO attributes, platform economics; 10x thinking; rebundling/unbundling; redefining operational processes. | 2 | Ismail, S., Malone, M., & van Geest, Y. (2014/2023). Exponential Organizations 2.0.<br>Parker, Van Alstyne & Choudary (2016). Platform Revolution. McAfee, A. & Brynjolfsson, E. (2017). Machine, Platform, Crowd. |

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| 7. Algorithmic bias, fairness, and explainability. Sources of bias (data, model, deployment); fairness definitions and trade-offs; interpretability vs. explainability; | 2 | O'Neil, C. (2016). Weapons of Math Destruction.<br>Mitchell, M. (2019). Artificial Intelligence: A Guide for Thinking Humans, selected chapters. Barocas, Hardt & Narayanan (2023). Fairness and Machine Learning, ch. 1–3.<br>Gebru et al. (2021). Datasheets for Datasets. |
| 8. Privacy, surveillance, and data governance. Surveillance capitalism; informational self-determination; GDPR, EU AI Act tiers, US sectoral approaches; biometric and emotion-recognition systems. | 2 | Zuboff, S. (2019). The Age of Surveillance Capitalism, Introduction & Part II. EU AI Act (Regulation 2024/1689), key articles.<br>Floridi, L. (2023). The Ethics of Artificial Intelligence, ch. on privacy. |
| 9. Can we keep AI under control? Alignment, safety, and the long-term debate. What does it mean for an AI system to "do what we want"? Why is that harder than it sounds? | 2 | Russell, S. (2019). Human Compatible.<br>Bostrom, N. (2014). Superintelligence, selected chapters.<br>Anthropic (2022). Constitutional AI: Harmlessness from AI Feedback. MacAskill, W. (2022). What We Owe the Future, selected chapters. Narayanan, A. & Kapoor, S. (2024). AI Snake Oil (critical perspective). |
| 10. Synthetic media, deepfakes. Generative media and trust; provenance and watermarking. | 2 | Chesney, R. & Citron, D. (2019). Deepfakes and the New Disinformation War. Foreign Affairs. C2PA (latest). Content Credentials specification overview. Partnership on AI (latest). Responsible Practices for Synthetic Media. |
| 11. Labour, inequality, and concentration of power. Automation and skill polarisation; gig and platform labour; antitrust in the AI era; the geopolitics of foundation models. | 2 | Acemoglu, D. & Restrepo, P. (2022). Tasks, Automation, and the Rise in U.S. Wage Inequality. Econometrica. Crawford, K. (2021). Atlas of AI. Khan, L. (2024). FTC remarks on competition in AI (or equivalent recent policy text). |
| 12. Responsible innovation in practice. Ethics-by-design; algorithmic impact assessments; governance structures; the entrepreneur's responsibility under uncertainty. | 2 | Floridi, L. (2023). The Ethics of Artificial Intelligence, concluding chapters.<br>Mitchell, M. et al. (2019). Model Cards for Model Reporting. Metcalf, J. et al. (2021). Algorithmic Impact Assessments and Accountability.<br>Deloitte . Future of Risk in the Digital Era. |
| **Total** | **24** | |

**FINAL GRADE COMPOSITION**

| **Type of assignment** | **%** |
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| *Group Components 40%* | |
| Group work and presentation | 40% |
| *Individual Components 60%* | |
| Final exam | 40% |
| Case studies | 20% |

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| **Total:** | **100** |

**DESCRIPTION AND GRADING CRITERIA OF EACH ASSIGNMENT**

1. **Final exam** will count for 40% of the final grade. The lecturer reserves the right to choose the form of the exam (multiple choice/ open answer questions/ essay).

2. **Group project** Interdisciplinary teams of 4–5 students select one frontier technology cluster and produce a comprehensive foresight and ethics impact assessment. The deliverable comprises: (a) a state-of-the-art technology brief; (b) three plausible 5-to-10-year scenarios developed with formal scenario-planning methods; (c) a business opportunity map identifying at least three commercially viable applications; (d) a full ethics impact assessment covering fairness, privacy, accountability, environmental footprint, labour effects, and dual-use risks; and (e) a governance and responsible-innovation plan. Teams defend their work in a final pitch session with structured Q&A. Deliverable: 4000–5000 words plus appendices; 15-minute pitch.

   ***Grading criteria:***
   Depth and accuracy of technology analysis — credible sourcing, technical literacy, capacity to distinguish hype from substance (20%).
   Quality of scenarios — internal coherence, divergence across scenarios, integration of weak signals (15%).
   Strength of business opportunity case — defensibility, market logic, originality (15%).
   Sophistication of ethics impact assessment — use of recognized frameworks, identification of non-obvious harms, treatment of trade-offs (25%).
   Governance and responsible-innovation plan — actionability, alignment with EU AI Act / OECD principles (10%).
   Pitch and defence — clarity, persuasiveness, response to red-team challenge (15%).

**RETAKE POLICY**

If final (cumulative) mark of the course, including final exam score, is insufficient, students will be allowed to exercise their right of retake. The retake exam will cover all lectures and case-discussion topics discussed in class during the course. It will be held during the last week of the exam session and will replace the 40 % of exam. The lecturer reserves the right to choose the form of the exam (multiple choice/ open answer questions/ essay).

**REQUIRED READINGS**

Kurzweil, R. (2024). *The Singularity is Nearer: When We Merge with AI*. Viking.
Harari, Y. N. (2024). *Nexus: A Brief History of Information Networks from the Stone Age to AI*. Random House.
Suleyman, M. (2023). *The Coming Wave: Technology, Power, and the Twenty-First Century's Greatest Dilemma*. Crown.
Russell, S. (2019). *Human Compatible: Artificial Intelligence and the Problem of Control*. Viking.
Floridi, L. (2023). *The Ethics of Artificial Intelligence: Principles, Challenges, and Opportunities*. Oxford University Press.
Ismail, S., Malone, M., & van Geest, Y. (2023). *Exponential Organizations 2.0*. Diversion Books.
Diamandis, P., & Kotler, S. (2020). *The Future is Faster than You Think*. Simon & Schuster.
EU AI Act (Regulation (EU) 2024/1689). Selected articles (provided in course pack).

**Learning objectives for the Bachelor of Business Management**
*Programmes:*
*International Business and Communication,*
*Business Management and Marketing, Finance,*
*Entrepreneurship and Innovation*

| Learning Goals | Learning Objectives |
|---|---|
| Students will be critical thinkers | BLO1.1. Students will be able to understand core concepts and methods in the business disciplines |
| | BLO1.2. Students will be able to conduct a contextual analysis to identify a problem associated with their discipline, to generate managerial options and propose viable solutions |
| Students will be socially responsible in their related discipline | BLO2.1. Students will be knowledgeable about ethics and social responsibility |
| Students will be technology agile | BLO3.1. Students will demonstrate proficiency in common business software packages |
| | BLO3.2. Students will be able to make decisions using appropriate IT tools |
| Students will be effective communicators | BLO4.1. Students will be able to communicate reasonably in different settings according to target audience tasks and situations |
| | BLO4.2. Students will be able to convey their ideas effectively through an oral presentation |
| | BLO4.3. Students will be able to convey their ideas effectively in a written paper |