Syllabus

Kursbeschreibung

Titel der Lehrveranstaltung	Digital Transformation and Sustainability Management
Code der Lehrveranstaltung	47553
Zusätzlicher Titel der Lehrveranstaltung	
Wissenschaftlich-disziplinärer Bereich	IEGE-01/A
Sprache	Englisch
Studiengang	Master in Industrie- und Maschineningenieurwesen
Andere Studiengänge (gem. Lehrveranstaltung)	
Dozenten/Dozentinnen	Dott. Margherita Molinaro, Margherita.Molinaro@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/43550
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Zweites Semester
Studienjahr/e	1
KP	5
Vorlesungsstunden	28
Laboratoriumsstunden	18
Stunden für individuelles Studium	79
Vorgesehene Sprechzeiten	15
Inhaltsangabe	The course provides insights into the developments in digital transformation and sustainability that are reshaping manufacturing and logistics systems. First, students will be introduced to a managerial perspective to understand how digital technologies enable process innovation, new business models and new approaches to value creation, while generating new organizational challenges and requirements.

	Methods for evaluating alternative digital technology investment decisions will also be discussed. Second, they will be introduced to key sustainability management concepts, including sustainability certifications, sustainable business models and practices, reporting frameworks and sustainability measurement approaches such as carbon footprint analysis and life cycle thinking. Overall, the acquired knowledge will enable industrial and mechanical engineers to analyze, evaluate and influence the technological, organizational and sustainability-related developments affecting modern manufacturing and logistics systems.
Themen der Lehrveranstaltung	Digital Transformation: • Digital transformation concepts and enabling technologies • Digitalization of business processes • Digital transformation of business models • Organizational implications of digital transformation • Digital investments evaluation and decision-making Sustainability management: • Sustainability management principles • Sustainability certifications and standards • Circular and sustainable business models • Sustainability reporting and ESG performance measurement • Carbon footprint analysis and life cycle assessment
Stichwörter	Industry 4.0; digital business models; circular business models; sustainability measurement; sustainability reporting; life cycle thinking
Empfohlene Voraussetzungen	None.
Propädeutische Lehrveranstaltungen	
Unterrichtsform	Frontal lectures and exercises.
Anwesenheitspflicht	Strongly recommended.
Spezifische Bildungsziele und erwartete Lernergebnisse	Students will be able to: Knowledge and understanding • Explain the concepts of digitization, digitalization and digital transformation

	• Describe the main digital technologies and their impact on business processes, business models and organizations • Explain sustainability management principles, sustainability certifications and sustainable business practices • Describe sustainability reporting frameworks, carbon footprint analysis and life cycle assessment approaches Applying knowledge and understanding • Analyze opportunities for digital transformation in manufacturing, supply chain and customer-related processes • Design sustainability KPI systems and performance dashboards • Apply carbon footprint and life cycle thinking to products and organizational contexts Making judgements • Critically evaluate the benefits, limitations and trade-offs associated with digital transformation initiatives • Evaluate alternative digital investment options using economic, operational and sustainability criteria • Use appropriate methods and tools to support sustainability and digital transformation decisions • Define appropriate system boundaries, assumptions and data requirements for sustainability assessments Communication skills • Present and discuss digital transformation and sustainability challenges using appropriate terminology • Communicate assessment results and recommendations to technical and managerial audiences • Support decisions through the use of quantitative and qualitative evidence Learning skills • Autonomously extend the knowledge and problem-solving skills acquired during the study course to complex organizational challenges
Spezifisches Bildungsziel und erwartete Lernergebnisse (zusätzliche Informationen)	

Art der Prüfung	Written exam and case study assignments.
Bewertungskriterien	The mark is calculated from the results of the written exam and the case study assignments. The written exam counts 70% and the assignments count 30% of the final grade. The written exam is assessed considering: • correctness and completeness of the answers • ability to apply course concepts and methods to simple problems and exercises • ability to analyse and establish relationships among different topics • clarity and appropriate use of terminology The assignments are assessed considering: • consistency with the assignment requirements and quality of the analysis • appropriate application of course concepts and methods • ability to justify choices and effectively present the results
Pflichtliteratur	Lecture notes and documents for exercises will be available on the Microsoft Teams and/or the Open Learning Environment (OLE) pages of the course.
Weiterführende Literatur	**Digital Transformation** • Gupta, S. (2018). *Driving digital strategy: A guide to reimagining your business*. Harvard Business Press. • Hinterhuber, A., Vescovi, T., & Checchinato, F. (Eds.). (2021). *Managing digital transformation: Understanding the strategic process*. Routledge. • Rüßmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., & Harnisch, M. (2015). Industry 4.0: The future of productivity and growth in manufacturing industries. *Boston consulting group*, 9 (1), 54-89. **Sustainability Management** • Lacy, P., Long, J., & Spindler, W. (2020). *The Circular Economy Handbook*. Palgrave Macmillan, London. • GRI Standard Ed. 2021 (https://www.globalreporting.org/) • https://ellenmacarthurfoundation.org/

Weitere Informationen	
Ziele für nachhaltige Entwicklung (SDGs)	Menschenwürdige Arbeit und Wirtschaftswachstum, Maßnahmen zum Klimaschutz, Nachhaltiger Konsum und Produktion, Industrie, Innovation und Infrastruktur