

Syllabus

Course Description

Course title	Digital Transformation and Sustainability Management
Course code	47553
Scientific sector	ING-IND/35
Degree	Master in Industrial Mechanical Engineering (LM-33)
Semester	2
Year	I
Academic Year	2021-2022
Credits	5
Modular	No

Total lecturing hours	28 hours (14+14)
Total lab hours	-
Total exercise hours	18 hours (10+8)
Attendance	Strongly recommended (especially for exercise hours)
Prerequisites	none
Course page	https://www.unibz.it/en/faculties/sciencetechnology/master-industrial-mechanical-engineering/course-offering/

Specific educational objectives	<p>The course is complementary to specific courses of the area of Industrial Engineering.</p> <p>The learning objectives of part 1 are to introduce engineering students in the fundamentals of sustainability management. Specifically, it will deal with the key topics related to sustainable development.</p> <p>Part 2 provides the basics for the implementation of digitalization in all areas of the company. A business strategy and managerial view will be adopted to discuss different digital technologies, new business models, leadership, implementation drivers, challenges, and barriers. Finally, both digitalization and sustainability concepts will be linked to understand their relationships. The presented theoretical topics will be integrated through targeted real-world examples.</p>
Lecturers	<p>Dr. Fabrizio Bottacin, fabrizio.bottacin@unibz.it</p> <p>Dr. Marcos Dieste, marcos.dieste@unibz.it</p>

Scientific sector of the lecturers	ING-IND/35
Teaching language	English
Office hours	By appointment
Teaching assistant (if any)	None
Office hours	-
List of topics covered	<p><u>Part 1 (Prof. Bottacin)</u></p> <ol style="list-style-type: none"> 1. Introduction to Sustainability 2. Sustainability and its components <ol style="list-style-type: none"> a) Economic and Company's value b) Social Sustainability c) Environmental Sustainability 3. Sustainability at Institutional Level <ol style="list-style-type: none"> a) ONU's Sustainable Development Goals b) European Union Sustainability Programs c) Sustainability in Italy 4. Sustainability Strategy and Business Model <ol style="list-style-type: none"> a) Stakeholders and their importance b) Sustainability Strategy c) Business Models 5. Sustainability Communication <ol style="list-style-type: none"> a) ESG b) Communication for Stakeholders: from Environmental Reporting to Integrated Reporting <p><u>Part 2 (Prof. Dieste)</u></p> <ol style="list-style-type: none"> 1. Introduction to Digital Transformation 2. Digital transformation: a strategic view <ol style="list-style-type: none"> a) Business models and scope b) Transformation of the Value Chain c) Digital marketing d) Managing the digital transition e) Drivers and barriers of digital transformation 3. Desired and undesired effects of digital transformation on Sustainability <ol style="list-style-type: none"> a) Sustainability opportunities of digital transformation b) Sustainability challenges of digital transformation c) Connecting circular economy and digital technologies

	<p>Exercises</p> <p>In both parts, a specific case study will be proposed and analyzed in order to apply concepts that will be presented during the lectures.</p>
<p>Teaching format</p>	<p>Frontal lectures and exercises in class</p>
<p>Learning outcomes</p>	<p>Intended Learning Outcomes (ILO)</p> <p><u>Knowledge and understanding</u></p> <ol style="list-style-type: none"> 1. The students know the basic of Sustainability Management and the most important Sustainability Programs by Public Authorities. 2. The students are able to understand the issues related to the development, implementation and management Sustainability initiatives. 3. Advanced understanding of the strategic and operational aspects of Digital Transformation. 4. Knowledge of the various tasks, methods and approaches for managing the digital transformation. <p><u>Applying knowledge and understanding</u></p> <ol style="list-style-type: none"> 5. Students will be able to apply theoretical concepts of planning, organizing and managing Sustainability in organizations. 6. By means of exercises, the student will be able to use tools like Sustainability Balanced Scorecards and Sustainability Canvas, two of the most important instruments managers can use. 7. Students will be able to apply various tools and concepts for planning, organizing and managing the Digital Transformation. 8. By developing a case study, the student will be able to design a Digital Transformation strategy. <p><u>Communication skills</u></p> <ol style="list-style-type: none"> 9. Ability to structure and prepare Sustainability Reports for Stakeholders. 10. Ability to structure, prepare, and present arguments related to digital transformation topics. 11. Ability to prepare, conduct and join interactive discussions in class.

	<p><u>Ability to learn</u></p> <p>12. Ability to autonomously extend the knowledge acquired during the study course in different contexts.</p>									
Assessment	<u>Parts 1 and 2</u>									
	<table border="1"> <thead> <tr> <th>Form</th> <th>Length /duration</th> <th>ILOs assessed</th> </tr> </thead> <tbody> <tr> <td>Written exam</td> <td>2 hours</td> <td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11</td> </tr> <tr> <td>Case study presentation</td> <td>15 minutes per student/group for Part 1 15 minutes per student/group for Part 2</td> <td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</td> </tr> </tbody> </table>	Form	Length /duration	ILOs assessed	Written exam	2 hours	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Case study presentation	15 minutes per student/group for Part 1 15 minutes per student/group for Part 2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
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Assessment language	English									
Evaluation criteria and criteria for awarding marks	The grade is calculated from the results of the written exam and the case studies of both parts (1 and 2) of the course. The theoretical part counts 50% and the case studies count 50% of the final grade.									
Required readings	Lecture notes and documents for exercises will be available on the Microsoft Teams and the Open Learning Environment (OLE) pages of the course.									

<p>Supplementary readings</p>	<p>Part 1 (Prof. Bottacin)</p> <ul style="list-style-type: none"> • Lacy, P., Rutqvist, J. B. (2015) - <i>Waste to Wealth: The Circular Economy Advantage</i> - Palgrave Macmillan, London. • Lacy, P., Long, J., & Spindler, W. (2020) - <i>The Circular Economy Handbook</i> - Palgrave Macmillan, London. • Laura Bini · Marco Bellucci - <i>Integrated Sustainability Reporting</i> – Springer Ed. 2020 • GRI Standard Ed. 2021 (https://www.globalreporting.org/) • https://ellenmacarthurfoundation.org/ <p>Part 2 (Prof. Dieste)</p> <ul style="list-style-type: none"> • Gupta, S. (2018). <i>Driving digital strategy: A guide to reimagining your business</i>. Harvard Business Press. • Rogers, D. (2016). <i>The digital transformation playbook</i>. Columbia University Press. • Rübmann, 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. <i>Boston consulting group</i>, 9(1), 54-89.
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