Syllabus

Course Description

Course Title	Project, Process and Technology Management
Course Code	47540
Course Title Additional	
Scientific-Disciplinary Sector	
Language	English
Degree Course	Master in Industrial Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Patrick Dallasega, Patrick.Dallasega@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/33073 Prof. Guido Orzes, Guido.Orzes@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/36819
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	10
Teaching Hours	56
Lab Hours	36
Individual Study Hours	0
Planned Office Hours	
Contents Summary	The course is one of the basics of the scientific area of Industrial Engineering. The course gives a general overview of the main scientific contents. During the course, the presented theoretical topics will be integrated through targeted application-oriented exercises and through a real game-based business simulation. The learning objectives of module 1 are to introduce engineering

	students in the fundamentals of project management. Specifically, it will deal with the subjects of project planning, project scheduling and project monitoring. The learning objectives of module 2 are to introduce students to the fundamentals of process and technology management. In particular, the part that concerns the process management will deal with process identification, modelling and redesign and the part that concerns the technology management will deal with technology foresight and related methods.
Course Topics	Module 1 - Project Management 1. Introduction to Project Management 2. Project planning a) The Work Breakdown Structure (WBS) b) The Organizational Breakdown Structure (OBS) c) Planning of resources 3. Project scheduling methods a) Network diagram techniques (AOA, AON) b) The Critical Path Method (CPM) c) The Program Evaluation Review Technique (PERT) d) Project Crashing e) Resource allocation 4. Project progress measurement and forecast a) Progress measurement b) The Earned Value Analysis (EVA) c) The Earned Value Performance Measurement (EVPM) 5. Project risk management a) Methodologies for project risk identification b) Methodologies for project risk evaluation 6. Construction Project Management a) The Last Planner System (LPS) b) The Location Based Management System (LBMS) 7. Exercises a) Exercises on AOA, AON b) Exercises on CPM, PERT, project crashing, resource allocation c) Exercises on EVA d) Exercises using Microsoft Project e) Last Planner Simulation game f) Excursion to local companies to provide practical illustrations of project management processes.

	Module 2 - Process and Technology Management 4. Process management a) Introduction to business process management b) Process identification and description c) Process modelling (Business Process Model and Notation - BPMN) d) Process discovery e) Process analysis f) Process redesign Exercises: • Exercises on process modelling using the BPMN software BIZAGI • Case study (process modelling and redesign) 5. Technology management a) Introduction to technology management b) Technology management activities: acquisition, exploitation, identification, protection, selection c) Technology management tools: portfolio management, patent analysis, value analysis, stage-gate, S-curve, technology roadmapping Exercises on technology management
Keywords	project management, process management, technology management, project scheduling, project monitoring
Recommended Prerequisites	None
Propaedeutic Courses	
Teaching Format	Frontal lectures and exercises in class (laptops are required for some lectures and exercises).
Mandatory Attendance	Recommended
Specific Educational Objectives and Learning Outcomes	Intended Learning Outcomes (ILO) Module 1 - Project Management Knowledge and understanding: 1. The students know the basic and most common methodologies of Project Management (Planning, Scheduling and

	Monitoring) and the main used tools. 2. The students are able to understand the issues relating to the development, implementation and management of production and logistics systems; Applying knowledge and understanding: 3. Students will be able to apply theoretical concepts of planning, organizing and managing projects. 4. By means of exercises performed in the computer laboratory, the student will be able to use software tools like Microsoft Project, which is one of the most used tools of local companies. Making judgements 5. The students are able to interpret Key Performance Indicators of project management to understand if projects are over, under or on budget and time. Communication skills: 6. Ability to structure and prepare a presentation describing project management concepts with business language Ability to learn: 7. Ability to autonomously extend the knowledge acquired during the study course in different industrial contexts Module 2 - Process and Technology Management Knowledge and understanding: 8. The students will understand the issues related to the process identification, modelling and redesign and will know the basic and most common methods used in process management 9. The students will know various methods used for the technology management and foresight 10. The students will understand how firms can rely on external collaboration to innovate Applying knowledge and understanding: 11. Students will be able to apply theoretical concepts of process management and to use BPMN tools for the process description and modelling 12. Students will learn how to apply theoretical models of

	technology foresight and to implement complex technology foresight methods like T-start and scenario planning Making judgments: 13. Students will be able to transfer the knowledge and methods learned to real practical applications 14. Students will be able to describe processes in a way that allows to find their criticalities and to redesign them 15. Students will be able to recognize consciously the technological positioning of a company and to find options for its development and improvement, using technology foresight Communication skills: 16. Students will be able to present process analyses and technology roadmaps 17. Students will be able to interact in a competent and professional way in complex, multi-participants workshops like the ones used in T-plan and scenario planning methods Ability to learn: 18. Students will be able to autonomously extend the knowledge acquired during the study course by reading and understanding.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Module 1: Written exam: 2 hours; ILOs assessed: 1,2,3,4,5; Presentation case study: 15 minutes per student group; ILOs assessed: 5, 6, 7; Module 2: Written exam (1 exercise & 3 questions): 1,5 hours; ILOs assessed: 8 - 18; Case study (modelling and re-design): BPMN models + 1 page report; ILOs assessed: 8, 11, 13, 18. Assessment language: English
Evaluation Criteria	Project Management – Module 1: The grade is calculated from the results of the written exam and

	the case study (exercise part). The theoretical part counts 50% and the exercise part counts 50% of the final grade. Process and Technology Management – Module 2: The grade is based on a written exam with exercises and theoretical questions and on a case study (on process modelling and re-design). The written exam counts 80%, and the case study (modelling and re-design) 20% of the final grade. The assessment is based on ability to solve exercises about the topics of the course (process mapping and re-organization and technology roadmapping), clarity of answers, mastery of language (also with respect to teaching language), ability to summarize and establish relationships between topics. Final grade: Average of Module 1 and Module 2.
Required Readings	Module 1 Lecture notes and documents for exercises will be available on the Microsoft Teams group of the module. Module 2 Lecture slides and notes will be available in the OLE page of the module (self-enrollment key will be provided to students in the first lecture).
Supplementary Readings	**Module 1 - Project Management** · "Project Management for Construction" by Hendrickson http://www.ce.cmu.edu/pmbook/ · Meredith, J. and Mantel, S., (2000) "Project Management: A managerial Approach", J. Wiley & Sons New York · De Marco, A. (2011). "Project Management for Facility Constructions", Springer Science & Business Media. · Cantamessa, M., Cobos, E., Rafele, C., (2007) "Il Project Management – Un approccio sistemico alla gestione dei progetti", ISEDI De Agostini.

	· Pmi lexicon pm terms PMI.org · Project Management: A Systems Approach to Planning, Scheduling, and Controlling 11th Edition by Harold R. Kerzner (Author) · Project Management – Competency Development Framework · www.iso.org ISO21500:2013 – ISO21502-5 · www.pmi.org Project Management standard - PMBOK® GUIDE V Edition · http://www.ipma-usa.org/ IPMA_ICB_4_0_WEB **Module 2 - Process and Technology Management** · Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2018), 2nd edition. "Fundamentals of business process management", Berlin: Springer. · Modeler user guide of BIZAGI, available at: http://help.bizagi.com/process-modeler/en/ Technology management · Cetindamar, D., Phaal, R., & Probert, D. (2016). "Technology management: activities and tools". Macmillan International Higher Education. · Phaal, R., Farrukh, C., & Probert, D. (2010). T-Plan: "The fast-start to technology roadmapping: Planning your route to success". University of Cambridge, Institute for Manufacturing.
Further Information	
Sustainable Development Goals (SDGs)	Decent work and economic growth, Responsible consumption and production, Industry, innovation and infrastructure

Course Module

Course Constituent Title	Project Management
Course Code	47540A
Scientific-Disciplinary Sector	IIND-05/A

Language	English
Lecturers	Prof. Patrick Dallasega, Patrick.Dallasega@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/33073
Teaching Assistant	
Semester	First semester
CP	5
Responsible Lecturer	
Teaching Hours	28
Lab Hours	18
Individual Study Hours	79
Planned Office Hours	
Contents Summary	
Course Topics	1. Introduction to Project Management 2. Project planning a) The Work Breakdown Structure (WBS) b) The Organizational Breakdown Structure (OBS) c) Planning of resources 3. Project scheduling methods a) Network diagram techniques (AOA, AON) b) The Critical Path Method (CPM) c) The Program Evaluation Review Technique (PERT) d) Project Crashing e) Resource allocation 4. Project progress measurement and forecast a) Progress measurement b) The Earned Value Analysis (EVA) c) The Earned Value Performance Measurement (EVPM) 5. Project risk management a) Methodologies for project risk identification b) Methodologies for project risk evaluation 6. Construction Project Management a) The Last Planner System (LPS) b) The Location Based Management System (LBMS) 7. Exercises a) Exercises on AOA, AON

	b) Exercises on CPM, PERT, project crashing, resource allocation c) Exercises on EVA d) Exercises using Microsoft Project e) Last Planner Simulation game f) Excursion to local companies to provide practical illustrations of project management processes.
Teaching Format	Frontal lectures and exercises in class (laptops are required for some lectures and exercises).
Required Readings	Lecture notes and documents for exercises will be available on the Microsoft Teams group of the module.
Supplementary Readings	· "Project Management for Construction" by Hendrickson http://www.ce.cmu.edu/pmbook/ · Meredith, J. and Mantel, S., (2000) "Project Management: A managerial Approach", J. Wiley & Sons New York · De Marco, A. (2011). "Project Management for Facility Constructions", Springer Science & Business Media. · Cantamessa, M., Cobos, E., Rafele, C., (2007) "Il Project Management – Un approccio sistemico alla gestione dei progetti", ISEDI De Agostini. · Pmi lexicon pm terms PMI.org · Project Management: A Systems Approach to Planning, Scheduling, and Controlling 11th Edition by Harold R. Kerzner (Author) · Project Management – Competency Development Framework · www.iso.org ISO21500:2013 – ISO21502-5 · www.pmi.org Project Management standard - PMBOK® GUIDE V Edition · http://www.ipma-usa.org/ IPMA_ICB_4_0_WEB

Course Module

Course Constituent Title	Process and Technology Management
Course Code	47540B
Scientific-Disciplinary Sector	IEGE-01/A

Language	English
Lecturers	Prof. Guido Orzes, Guido.Orzes@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/36819
Teaching Assistant	
Semester	First semester
CP	5
Responsible Lecturer	
Teaching Hours	28
Lab Hours	18
Individual Study Hours	79
Planned Office Hours	
Contents Summary	
Course Topics	1. Process management a) Introduction to business process management b) Process identification and description c) Process modelling (Business Process Model and Notation - BPMN) d) Process discovery e) Process analysis f) Process redesign Exercises: • Exercises on process modelling using the BPMN software BIZAGI • Case study (process modelling and redesign) 2. Technology management a) Introduction to technology management b) Technology management activities: acquisition, exploitation, identification, protection, selection c) Technology management tools: portfolio management, patent analysis, value analysis, stage-gate, S-curve, technology roadmapping Exercises on technology management
Teaching Format	Frontal lectures and exercises in class (laptops are required for some exercises).

Required Readings	Lecture slides and notes will be available in the OLE page of the module (self-enrollment key will be provided to students in the first lecture).
Supplementary Readings	Process management · Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2018), 2nd edition. "Fundamentals of business process management", Berlin: Springer. · Modeler user guide of BIZAGI, available at: http://help.bizagi.com/process-modeler/en/ Technology management · Cetindamar, D., Phaal, R., & Probert, D. (2016). "Technology management: activities and tools". Macmillan International Higher Education. Phaal, R., Farrukh, C., & Probert, D. (2010). T-Plan: "The fast-start to technology roadmapping: Planning your route to success". University of Cambridge, Institute for Manufacturing.