Syllabus

Course Description

Course Title	Production Systems and Industrial Logistics
Course Code	42108
Course Title Additional	
Scientific-Disciplinary Sector	IIND-04/A
Language	German
Degree Course	Bachelor in Industrial and Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Dr. Erwin Rauch, Erwin.Rauch@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/17786 Prof. Dr.-Ing. Dominik Matt, Dominik.Matt@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/492
Teaching Assistant	
Semester	First semester
Course Year/s	2, 3
CP	10
Teaching Hours	48
Lab Hours	60
Individual Study Hours	142
Planned Office Hours	30
Contents Summary	- Classification and systematisation of industrial production systems; Basic concepts and definitions of production science; - Lean Production Systems: Value Stream Mapping and Optimization, other basic concepts of the Lean Production Toolbox (5S, seven sources of waste, Kaizen, TPM); - Material flow optimization and layout planning; - Manufacturing systems: single manufacturing cells, group

	technology, cellular manufacturing, flexible manufacturing systems; - Assembly systems: manual-hybrid-automated assembly systems; - Methods of time measurement; - Introduction to Industry 4.0.
Course Topics	The following topics are covered in the laboratory exercises: - Re-design of an assembly/packaging station based on a practical case study from industry - Design and optimization of a manual assembly line - Design of safe and ergonomic collaborative workplaces (human-robot collaboration) - Design and use of assistance systems in production.
Keywords	Production system, Lean Production
Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	Frontal lectures, exercises (case studies and lab), excursions.
Mandatory Attendance	Not compulsory N.B.: For those students who wish to collect points for the examination during the semester as part of the laboratory exercises ("Smart Mini Factory Lab" and "Industry Challenge"), attendance is compulsory and will also be checked; a shortened examination is provided for these students.
Specific Educational Objectives and Learning Outcomes	The course is part of the scientific and didactic sector in "Manufacturing Technology and Systems" and belongs to the class "caratterizzanti" for both curricula of the Bachelor in Industrial and Mechanical Engineering. It aims at teaching both scientific foundations and practical methods and helps to develop specific professional skills. The course provides students of the Bachelor in Industrial and Mechanical Engineering with a basic understanding of planning, dimensioning, design and optimization of production systems (both conventional and automated). Learning outcomes Knowledge and understanding 1. The student knows the basics of modern production management, 2. Knowledge of modern methods and techniques of planning, dimensioning, design and optimization of production systems.

	3. Knowledge and methods for Value Stream Mapping 4. Knowledge in Industry 4.0 techniques Applying knowledge and understanding 5. Development of practical skills in dealing with methods and techniques of production system planning and optimization through the application of theoretical learning content in the context of case studies and laboratory exercises 6. Practical lesson on excursions to various industrial plants. Making judgements 7. Ability for timely and goal-oriented planning and implementation of technical projects 8. Ability for individual working, structuring and documentation of innovative problem solutions using modern technologies for information acquisition and processing. Communication skills 9. Ability to structure, prepare and present scientific and technical documentation 10. Ability to describe project activities and to discuss them with decision-makers. Learning skills 11. Ability to autonomously extend the knowledge acquired during the study course by reading and understanding scientific and technical documentation. 12. The student is able to enlarge his knowledge through self-study and consultation of scientific and technical texts.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	- Formative Assessment (no effect on the exam mark): Exercises in lecture room: after each lecture unit; Nr. Learning outcomes: 1, 2, 3, 5, 7; Group work: 2-4 hours during lecture; Nr. Learning outcomes: 1, 2, 5, 8, 9, 10; Case study with industrial company: 28 hours; Nr. Learning outcomes: 1, 2, 3, 4, 6, 7, 10. - Summative Assessment (has effect on the exam mark): Written exam with theory questions and questions on the content of expert lectures: Ca. 30% - ca. 16 questions on theory; Nr. Learning outcomes: 1, 2, 4, 7, 11, 12;

	Written exam with exercises: Ca. 30% - ca. 3 exercises to calculate/solve; Nr. Learning outcomes: Written exam with exercises* Ca. 30% - ca. 3 exercises to calculate/solve 2, 3, 5, 7, 11, 12; Project work in the Smart Mini Factory lab and industry case study: 40% - case study work in the mini-factory lab and presentation of results; Nr. Learning outcomes: 2, 4, 5, 7, 8, 9, 10.
Evaluation Criteria	Final evaluation by a single final grade. The final grade is calculated 60% from the results of the written exam* (theory and case study work) 20% from the results of the industry case study in form of a report and 20% of the results performed within the exercises in the Smart Mini Factory lab. NOTE: For those students who have not actively participated in any or only one of the two assessed laboratory exercises (Smart Mini Factory Laboratory or Industry Challenge) (attendance as well as a report and a final presentation are required for successful participation), one or two additional examination parts will be provided in the written examination. In these cases, the duration of the examination is adequately adapted to the additional examination part(s). Criteria for the evaluation of the project: Accuracy and completeness, degree of innovation of the proposed solution, quality of the project report and presentation. Criteria for the evaluation of the written examination: completeness and correctness of the answers.
Required Readings	There is no textbook covering completely the entire contents of the course. The students receive a lecture accompanying course material.
Supplementary Readings	Mikell P. Groover, Automation, Production Systems, and Computer-Integrated Manufacturing (3rd Edition), Prentice Hall 2007.
Further Information	Laptops with MS Office (Word, Excel, PowerPoint).
Sustainable Development Goals (SDGs)	Quality education, Responsible consumption and production, Industry, innovation and infrastructure, Decent work and economic growth