Syllabus

Course Description

Course Title	Digital Production Planning and Quality Control
Course Code	42183
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
Teaching Assistant	
Semester	Second semester
Course Year/s	2
CP	8
Teaching Hours	48
Lab Hours	30
Individual Study Hours	122
Planned Office Hours	24
Contents Summary	- Forecast planning methods (sales and operations planning); - Lot size calculation (static, dynamic); - MRP, Re-Order Point Calculation; - Scheduling of production orders; - Production control methods (Kanban, BOA, OPT,...); - Capacity planning methods.
Course Topics	The course covers the following topics: 1. Introduction to a new era of production 2. Work preparation and time management

	3. Fundamentals and methods of production planning and control 4. Production program planning 5. Material requirements and scheduling/capacity planning 6. Production control 7. Organizational models of PPS 8. Digital planning tools 9. Quality planning 10. Methods of quality assurance 11. Statistical process control and indicators 12. Quality improvement in production Exercises and case studies: 1) Development of a digital tool for planning and control of production orders in groups (16 hours group work) 2) Exercises with miniTab for digital quality planning and statistical process control (14 hours). The lecture is completed with presentations by external experts from industry and practise.
Keywords	Production planning, production control, quality assurance, quality management
Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	Frontal lectures, exercises (Exercises, case studies and computer lab), expert presentations.
Mandatory Attendance	No.
Specific Educational Objectives and Learning Outcomes	The lecture "Digital Production Planning and Quality Assurance" is part of the so-called "characterizing" courses for the curricula "Logistics and Production" as well as "Automation" in the Bachelor's program in Industrial and Mechanical Engineering. In the first part, the lecture introduces students to the fundamentals of strategic, tactical, and especially operational production management, with a focus on planning and control. In addition to theoretical models and methods, the use of modern digital and computer-aided tools in the production environment is covered and practically tested through exercises and case studies. The second part of the lecture provides an introduction to quality management and quality assurance in production. This includes theoretical models and methods for quality planning, assurance,

	and improvement in the production environment. Students reinforce their knowledge through practical exercises in statistical process control (SPC) using modern IT tools such as Minitab, among others. Knowledge and understanding 1. The student knows the basics of modern production and quality management, 2. The student knows the current methods and models for production planning and quality control. Applying knowledge and understanding 3. The student applies and practices theoretical contents through exercises, case studies and project work. Theory contents are practiced through calculation exercises using practical examples. 4. The students develop independently a prototype for planning and control of production orders in the lab. 5. Presentation techniques are trained using equipment such as flipcharts and power point presentations. 6. In expert presentations, students have the opportunity to experience and see how production planning and quality control is used in practice. Making judgements 7. Depending on the situation in the company, the student can judge the use of appropriate methods, models and systems for production planning and quality control. 8. He is also able to distinguish between strategic, tactical and operational tasks and objectives of production planning and quality control. Communication skills 9. The student can make professional discussions on production planning and quality control and is able to structure, present and argue professional content through analog (flipchart) and digital (PowerPoint) media. Learning skills 10. The student learns both by frontal teaching (theory part) as well as by exercises in the classroom and in the lab (practical

	exercises). 11. 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	Summative Assessment (has effect on the exam mark): - Written exam with theory questions and questions on the content of expert lectures: Ca. 30% - ca. 14 questions on theory; Nr. Learning outcomes: 1, 2, 6, 8, 11. - Written exam with exercises: Ca. 20% - ca. 5 to 6 exercises to calculate; Nr. Learning outcomes: 2, 3, 7. - Project work in the pc lab: 50% - 2 case studies (PPC-Tool and miniTab) in the PC lab and subsequent presentation of the results; Nr. Learning outcomes: 2, 4, 5, 7, 9, 10, 11.
Evaluation Criteria	Final evaluation by a single final grade. The final grade is calculated 50% from the results of the written exam* (theory and calculation exercises) and 50% from the results of the project work on production planning (30%), the project work on quality assurance (10%) and assignments (10%) performed within the exercises. Criteria for the evaluation of the written examination: completeness and correctness of the answers. Criteria for the evaluation of the project work / case study: accuracy and completeness as well as creativity and innovation of the proposed solution, the quality of the elaboration and quality of presentation.
Required Readings	Lecture notes and documents for exercise will be available on the Teams folder.
Supplementary Readings	Produktionsplanung und -steuerung Grundlagen, Gestaltung und Konzepte, Günther Schuh (Hrsg.) (see library) MES - Manufacturing Execution System: Moderne

	Informationstechnologie unterstützt die Wertschöpfung, Jürgen Kletti (Hrsg.) (see library). Sihn, W., Sunk, A., Nemeth, T., Kuhlang, P., & Matyas, K. (2016). Produktion und Qualität: Organisation, Management, Prozesse. Carl Hanser Verlag GmbH
Further Information	Sotware used: Demonstration of different software systems, Mini Tab, MS Excel.
Sustainable Development Goals (SDGs)	Responsible consumption and production, Industry, innovation and infrastructure