

Module code	Module name	Short description	Semester	ECTS
Compulsory modules „Industrial Production“				
4IP-MA1-10	Mathematics 1	Upon completing the module, students are able to mathematically describe technical problems and to select and apply suitable methods to solve these problems. Students are capable of effectively applying theory combined with standard software and mathematics software. They acquire fundamental knowledge in the field of financial mathematics and statistics.	1	4
4IP-MA2-20	Mathematics 2	Upon completing the module, students are able to mathematically describe technical problems and to select and apply suitable methods to solve these problems. Students are capable of effectively applying theory combined with standard software and mathematics software.	2	4
4IP-KONS1-10	Construction 1	Upon completing the module, students are able to recognize the importance of design within the company and throughout the entire product lifecycle and to apply the acquired strategies for the development, use and disposal of new products/services. This is based on the development of spatial imagination and the basic ability to produce technical drawings.	1	5
4IP-TM-12	Technical Mechanics	Upon completing the module, students will have acquired basic knowledge in the field of technical mechanics and will be able to apply concepts and methods of the subject in practice.	1 and 2	7
4IP-FKL-34	Strength of Materials	The module aims to impart the basics of strength theory. Upon completing the module, students are able to apply these basics together with their knowledge of technical mechanics to the functional and economic design of machine parts. They are enabled to practically apply concepts and methods in the field of strength theory.	3 and 4	8
4IP-E TEL-30	Electrical Engineering / Physics	The module aims to enable students to apply basic electrical laws and physical relationships in connection with technical systems and their assemblies or installations, to determine relationships and to assess action flows. This is based on the integration of components, elementary basic circuits and electrical measuring instruments into a complete system as well as the comprehension of signal acquisition and signal processing as a component of control engineering. Focus is laid on the application of electrical engineering/physics for processes and procedures in production engineering.	3	8
4IP-WFT-12	Materials and Production Engineering	The module aims to familiarize students with the basic properties, treatment options and the use of different materials as well as materials testing techniques. Furthermore, they are enabled to select and use suitable manufacturing processes for company-specific applications.	1 and 2	7

4IP-INFOCAD-10	Information Technology CAD 2D	Upon completing the module, students have developed a basic understanding of the areas of application of IT in everyday life. Moreover, they have acquired fundamental knowledge of hardware and software as well as the main functions of standard office programs. They are able to master the problems of information acquisition and processing from different systems as well as their processing and interpretation of results.	1	3
4IP-CAD3D-30	CAD 3D Techniques / Simulation	Students acquire fundamental knowledge of general methods and working techniques of CAD-supported design. After completing the module, students are able to understand technical drawings and to create, manipulate and visualize simple two- and three-dimensional CAD models and generate technical drawings on this basis.	3	5
4IP-BWL-23	Business Administration	Upon completing the module, students are able to apply business management knowledge to solve business problems. Students are to be enabled to think and act economically. This includes recognizing the social responsibility of business administration and thus acquiring a better socio-political ability to engage in discussion. Students are to develop skills that help to achieve the goals of corporate accounting in the company thus contributing to economic success.	2 and 3	8
4IP-AVBO1-23	Work Preparation – Business Organization 1	Upon completion of the module, students will have acquired the competences needed to effectively and efficiently organize business processes. The module imparts fundamental skills in business organization as well as the basics of time data management and workflow design. They acquire basic knowledge of work preparation and work planning.	2 und 3	5
4IP-AVBO2-40	Work Preparation – Business Organization 2	Upon completion of the module, students will have acquired the skills to design work systems effectively and efficiently. The module imparts fundamental skills in work design, time management and pay structure. They acquire basic knowledge of process-oriented workflow design in the company.	4	5
4IP-KONS2-30	Construction 2	Upon completing the module, students are able to create a simple design and to lay out, design and calculate selected machine elements in accordance with the set task. This is based on spatial imagination and the basic skills for producing technical drawings and understanding the construction elements.	3	5
4IP-BENG-20	Business English	Upon completion of the module, students can talk about themselves and their professional and academic context in English and deal with everyday communication situations in the professional environment. Furthermore, they are enabled to communicate orally and in writing within their company and between companies. Students can present their company with its basic processes and essential facts in written and oral form. They are able to use modern presentation techniques.	2	4

4IP-TENG-40	English for Special Purposes	Students are enabled to communicate in the field of technology on an international level. Accompanying to the degree program "Industrial Production", the seminar gives students a detailed insight into this economic area and imparts the necessary foreign language skills. After completing the module, students are able to describe products, work processes and systems in the company in the foreign language and to present their company to an international audience. Furthermore, students are sensitized to intercultural differences that may arise in the context of their professional activities in an international environment. They are enabled to communicate interculturally competent with foreign business partners on general and job-related topics.	4	5
4IP-GWA-10	Principles of Academic Work	Upon completing the module, students are able to produce written presentations or project reports in their field of study within the prescribed time limit and taking into account the basic values of a conceptual scientific approach as well as the corresponding standards of content and form. To this end, students acquire skills in self-management and time management, which enables them to plan, coordinate and critically analyze their working style and how they deal with time. Students are able to design, lead and successfully complete their own projects and to use computer-aided project management systems to complete tasks.	1	5
4IP-QMFMT-56	Quality Management and Production Measurement Technology 1	Students are to learn measurement technology for product-related tasks and apply their knowledge of measurement technology to solve tasks in production and quality assurance. Based on their knowledge, students can interpret drawing entries and select suitable measuring and testing equipment. Upon completion of the module, students are able to determine product characteristics for quality assurance. Furthermore, students are familiarized with the basic concerns and the structure of a quality management system. The basis is provided by the ISO 9000 family of standards for structuring a QMS.	5 and 6	7
4IP-RECHT-60	Law	Upon completion of the module, students have gained a general overview of the legal system and in particular of civil law as well as labor and environmental law. They are enabled to deal with legal issues and to independently put the acquired knowledge into practice.	6	6

In-depth Modules Production Technology and Production Management				
4IP-PRO-45	Production / Production Techniques	The module aims to provide students with an understanding of the connections between product, production process, macro and microenvironment. They are to be enabled to recognize connections between factory planning and corporate management and include them in the solution of complex tasks. The consolidation and application of the knowledge is supported by internships.	4 and 5	9
4IP-PPS-45	Production Planning and Control	The module aims to familiarize students with the principles and methods of process-oriented planning, design and control of production and business processes and to enable them to apply theoretically acquired knowledge in a practice-oriented manner, including computer-aided PPS/ERP systems. This also includes knowledge of the broad field of production data acquisition and evaluation and its target-oriented application. With this module, students acquire proficiency in mastering the entire process chain in a company. This knowledge is consolidated through simulation and case studies.	4 and 5	6
4IP-QM-60	Quality Assurance Systems and Management	Students are familiarized with the requirements, methods and objectives of Total Quality Management (TQM). The application of quality and management techniques specific to the production sector are linked to risk management concerns. Students are to obtain a comprehensive view of a QM and environmental management system.	6	6
Compulsory elective modules Production Technology				
4IP-FAT-56	Manufacturing Automation	Upon completion of the module, students are able to analyze or help design an automated production process as a complex system in which typical automation components (e.g. PLC technology, robot systems) are used. Based on their knowledge of modern production structures, students are able to set up or organize flexible manufacturing structures. They are able to select industrial control technology and robot systems for production use and implement simple solutions in terms of programming.	5 and 6	8
4IP-ST1-56	Systems Engineering PT	Upon completion of the module, students are able to develop a comprehensive understanding of the physical relationships of systems engineering. They can evaluate the assemblies and systems with regard to service life and failure probability. The students are able to identify interrelationships, assess impact processes and derive appropriate courses of action.	5 and 6	11
Compulsory elective modules Production Management				
4IP-GFMP-45	Design of Manufacturing and Assembly Processes	Upon completion of the module, students are able to work independently on problems in the field of work preparation and process design in manufacturing and assembly. They are also able to think ahead in order to find optimal solutions. Students acquire the process planning knowledge necessary for the successful processing of special engineering problems under consideration of business management criteria.	4 and 5	7

		Furthermore, students attain fundamental knowledge in the field of process design in the areas of parts manufacturing and assembly.		
4IP-PM-56	Production Management	Upon completion of the module, students are able to understand effective personnel management as a fundamental means of achieving sustainable corporate success. Students learn to practically apply the theoretical components of HR management, from recognizing personnel requirements to procurement, management and the further development of human resources. Students acquire profound knowledge of management accounting, e.g. the structure and application of a performance measurement system. After completing the module, students will also have basic knowledge of technical sales.	5 and 6	7
4IP-PLL-60	Production and Warehouse Logistics	Upon completion of the module, students will have acquired competences for the effective and sustainable design of production and logistics. Students acquire fundamental skills in the analysis and optimization of material flows and the design of logistical processes. Upon completion of the module, students will have basic theoretical knowledge of the planning, design and optimization of processes along the value chain.	6	5
Compulsory modules Production Metrology and QM				
4IP-CAX-45	Computer-aided Technologies (CAX)	The module aims to familiarize students with the principles of planning and control of business processes, to enable them to understand the role of planning and control within the CAX chain and to correctly assess their significance for a process-oriented approach in the company. Students acquire interdisciplinary skills for planning, designing and controlling operational processes. Due to the growing interlinking of industrial production processes, production metrology is also increasingly included in the computer-aided data exchange with other areas. Students gain knowledge of a wide variety of interfaces and data transfer options.	4 and 5	6
4IP-QSFMT-45	Quality Assurance and Production Metrology	Students are familiarized with the requirements, methods and objectives of Total Quality Management (TQM). The module focuses on the extended application of quality and management techniques especially for the field of measurement and testing processes. Students are familiarized with the implementation of a QM and environmental management system combined with risk management systems. The comparison of the requirements of ISO 9001 and TS 16949 is an essential element of the module.	4 and 5	15
4IP-PPA-56	Test Process Automation	Upon completion of the module, students are able to analyze and design an automated measurement or testing process as a complex system. Modern automation components, programmable logic controllers (PLC technology) handling or robot systems are used. Students have knowledge of current testing	5 and 6	8

		structures and testing machines. They are able to select industrial control technology and robot systems for the testing process and to implement simple solutions in terms of programming.		
4IP-ST2-60	Systems Engineering FMQ	Upon completion of the module, students are able to develop a comprehensive understanding of the physical relationships of systems engineering. Students can evaluate the assemblies and mechatronic systems with regard to their applicability (energy balance, balance of forces). Pneumatic and hydraulic components can be correctly selected and planned based on the technical specifications. Students are able to understand the interrelationships between different disciplines of engineering technology and assess action flows.	6	11
Practical modules				
4IP-PRAX1-20	Practice 1	In this practical module, students get to know the organization of their company, understand basic operational processes in selected functional areas and are given an overview of the production and communication relationships in the company. The process structure and organizational structure of the division are internalized. This practical module describes the employment in the first and second practical phase.	2	12
4IP-PRAX2-40	Practice 2	In this practical module, students are acquainted with the engineering contexts of their company. They know how to familiarize themselves with operational processes in the preparation and implementation area. The understanding of the organization of the entire company is developed.	4	12
4IP-PRAX3-50	Practice 3	In this practical module, students learn to work independently on a task and present the results. Focus is placed on taking on innovative tasks that are of primary interest to the practice partner. The integration into a department is prepared. The understanding of the company's value-added and process chain is enhanced.	5	6
BTH-60	Bachelor Thesis	In their bachelor theses, students independently solve a specific problem within the stipulated timeframe taking into account economic and scientific aspects. The reviewer from the company evaluates the benefit for the company. Using scientific methods and including own scientific contributions, the students work on a task, from the interpretation of the task to the proposed solution and the documented result. The bachelor thesis applies the acquired specialist and methodological skills, taking into account the competences specifically gained in the respective study program in an experimental, theoretical or constructive manner. It can therefore consist of a combination of these options.	6	9