Hochschule Esslingen
University of Applied Sciences

Module Catalog

Bachelor's Program

Industrial Management/ Automobile Industry (TAB)

Hochschule of Esslingen

Last Update 05.02.2018

Index

Module 0901 Economics 1

1	Module no.	Major	Semester	Offering	Duration	Module Type	Workload (hr.)	ECTS Credits
	0901	TAB	1	☒WS ☒SS	1 Semester	Obligatory	240	8

2	Courses	Course Style	Language	Frequency (SWS)	(hr.)	Self Study (hr.)	ECTS Credits
	a) Introduction to Business Administration	Lecture	German	4	60	60	4
	b) Economics	Lecture	German	4	60	60	4

3	Qualification Target Matrix	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☒
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**

After completing the module, students will:

- Understand fundamental business methodologies and accounting principles
- Understand Micro and Macroeconomic fundamentals. They will understand social and Macroeconomic implications involving State and entrepreneurial actions

Remember and Understand (Knowledge)

- As a foundation for subsequent lectures, first semester students will receive comprehensive, practical, and theoretical knowledge in Business Administration and Economics (see Content below)

Apply (Skills)

- As a foundation for subsequent lectures, first semester students will receive comprehensive, practical, and theoretical knowledge in Business Administration and Economics (see Content below)

Analyze and Evaluate (Competences)

- Students will classify and analyze Business and Economics-related publication. While recognizing multiple interdependecies, they will understand conflicting goals that must be overcome in a pluralistic society

5 **Content**

Introduction to Business Administration:

- Fundamentals
- Constitutive decisions (decision theory, location decisions, legal decisions, decisions on inter-company connections)
- Corporate governance (corporate governance, organization, personnel management, controlling)
- Accounting and finance (accounting, internal accounting, financing, investing)
- Performance profiling (innovation management, procurement, logistics, production management, marketing)

Economics:

- Overview of economic history
- Supply and Demand
- Elasticity
- Trade advantages
- Effect and efficiency of economic policy measures
- Welfare economics and market efficiency
- Externalities
- Efficiency of environmental policies

Module 0901 Economics 1

	• Public / Private / Club goods, common-pool resources • Control system • Corporate behavior and industrial economics • Labor Economics • Income distribution, justice • In-depth review of a current case study
6	**Participation Requirement** According to study and examination regulations: None Recommended: None
7	**Forms of Assessment** Two 90 minute exams, one for each course. Module performance will be the weighted average scores on the exams.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Norbert Jäger
10	**Literature** Introduction to Business Administration • Vahs, D./Schäfer-Kunz, J.: Einführung in die Betriebswirtschaftslehre, Schäffer-Poeschel Verlag • Wöhe, G./Döring, U./Brösel, G.: Einführung in die Allgemeine Betriebswirtschaftslehre, Verlag Vahlen Economics • Gregory Mankiw: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel Verlag • Marco Herrmann: Arbeitsbuch zu Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel Verlag
11	**Contribution to the Program** The courses "Introduction to Business Administration" and "Economics" are fundamental to understanding Economics during this program.
12	**Last Update** 05.02.2018

Module 0902 Fundamental Technology

1	**Module no.** 0902	**Major** TAB	**Semester** 1	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 240	**ECTS Credits** 8

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Material Science	Lecture	German	2	30	30	2
	b) Statics and Strength of Materials	Lecture	German	2	30	30	2
	c) Production Processes	Lecture	German	2	30	30	2
	d) Technical Drawing	Lab	German	1	15	45	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
Apply (Skills)
Analyze and Evaluate (Competences)

Materials Science:
- Students will understand important materials and their construction, properties, meaning and applicability
- Students will understand the relationship between internal structure and functional properties of materials
- Students can assess opportunities to further process materials
- Students will understand the possibilities and limitations of different material groups
- Students will have in-depth knowledge of ferrous metals.

Statics and Strength of Materials:
- Students will analyze systems of forces (decomposition and assembly of forces)
- Students will recognize and calculate the resulting effect of multiple forces and moments
- Students will mathematically and graphically determine unknown forces in planar systems
- Students will computationally determine unknown forces and general systems of forces
- Students will calculate internal stress in components for the base load cases
- Students will understand and assess a component's failure mechanism

Production Processes:
- Students will learn the six main groups of manufacturing processes (Casting, Forming, Separating, Joining, Imaging and Coating, and Machining) and their respective characteristics
- Students will understand the intricacies of the first three manufacturing processes (Casting, Forming, and Separating).
- The students will learn both traditional and innovative processes
- Students will evaluate advantages and disadvantages of alternative processes
- Students will identify boundary conditions for the technical and economical use of a process
- Students will understand the interaction of several processes in a process chain
- The students will recognize independencies and dependencies within the process chain for a typical component
- Students will understand the relationship of Production Process to Material Science and Statics

Module 0902 Fundamental Technology

	Technical Drawing: • Students will recognize the importance of technical drawings as a communication tool for engineers • Students will understand the rules of technical drawing • Students will read technical drawings • Students will create simple technical drawings and sketches with paper and pencil
5	**Content** • Fundamentals of Materials Science and their application in Vehicle and Mechanical engineering. • Fundamentals of Statics and Strength Theory and their application in Vehicle and Mechanical engineering. • Manufacturing processes and their application in Vehicle and Mechanical engineering • Rules of technical drawing and its application in Vehicle and Mechanical engineering
6	**Participation Requirement** According to study and examination regulations: None Recommended: Knowledge of Physics and Mathematics
7	**Forms of Assessment** One 120 minute exam consisting of 3 parts: Material Science, Statics and Strength Theory, and Production Processes. 40 minutes is alloted for each part of the exam. Module performance will be the weighted score on each part of the exam. The Technical Drawing course will offer a practical exam (construction drawing) that will not be graded.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr.-Ing. Gerhard Kehl
10	**Literature** • Roos/Maile: Werkstoffkunde für Ingenieure, Springer-Verlag • Mayr: Technische Mechanik, Hanser-Verlag • Westkämper/Warnecke: Einführung in die Fertigungstechnik, Teubner-Verlag • Hoischen/Hesser: Technisches Zeichnen • N.N.: Tabellenbuch Metall, Europa-Verlag
11	**Contribution to the Program** In this module, the students acquire fundamental technical skills and engineering knowledge that broaden their understanding of a technical business economist who works in the industrial environment, at the interface between technical and business areas.
12	**Last Update** 05.02.2018

Module 0903 Mathematics 1

1	**Module no.** 0903	**Major** TAB	**Semester** 1	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS) (hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Mathematics 1		Lecture with exercises		German	5 75	105	6

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☒	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand the importance of fundamental mathetmatical concepts, formulas, rules, procedures, and ways of thinking outlined below in the "Content" section
- Familiar with typical application examples

Apply (Skills)
- Apply mathematical terms, procedures, formulas, and calculation rules to concrete questions

Analyze and Evaluate (Competences)
- Mathematically asssess, calculate, and extropolate solutions for practical application in various fields (economic, technology, etc.)
- Evaluate which mathematical solution is suitable to solve a complex problem

Develop and Expand (Competences)
- Develop problem-solving strategies
- Develop a systematic approach to critical thinking

5 **Content**
- Trigonometry and vector calculation: trigonometric functions, triangulation, vectors, coordinates, addition, resulting force
- Variable functions: Properties of functions, graphs, and calculation rules; Inverse. Power, Root, Exponential, and Logarithm functions; Zeroing determination; economic functions such as price, sales, revenue, cost, profit functions, and production functions
- Differential calculation of a variable: Derivatives, derivation rules; continuity and differentiability; tangents; Relationships between function and derivatives; Extreme and turning points; economic applications of differential calculus: determination of optima, economic interpretation of derivative (limit functions, elasticity)
- Linear system of equations, Gaussian algorithm; internal activity allocation
- Linear optimization: mathematical description, graphical solution method; Basic idea of the simplex method
- Matrix calculation: matrices, arithmetic operations (addition / subtraction, s-multiplication, multiplication), transpose, inverse; multi-level production process
- Functions of multiple variables: mathematical description, intersection curves, partial derivatives, extremes with and without constraints
- Financial Mathematics: compound interest formula, cash and final values of cash flows, pension calculation, annuities

6 **Participation Requirement**
According to study and examination regulations:
None

Module 0903 Mathematics 1

	Recommended: • Mathematics knowledge: numerical calculations with fractions, break terms, powers, roots, logarithms, algebraic transformations, sets and functions, properties of elementary functions, equations and inequalities, basic geometric concepts and formulas • Familiarity with a scientific calculator
7	**Forms of Assessment** One 90 minute exam. Faculty will provide calculators and will allow the use of items listed below in the "Literature" section.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Plappert
10	**Literature** • Script • Collection of exercises and sample exams (online) • Mohr: Mathematische Formeln für das Studium an Fachhochschulen. Hanser. • Mohr, Plappert: Einführung in die Mathematik für Wirtschaftsinformatiker, Grenzwert-Verlag
11	**Contribution to the Program** Students will acquire fundamental mathematical knowledge and skills that will be needed for future economic and technical courses.
12	**Last Update** 05.02.2018

Module 0904 Introduction to Technology and Business Studies

1	**Module no.** 0904	**Major** TAB	**Semester** 1	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 120	**ECTS Credits** 4
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS)** **(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Introduction to Technology		Lecture		English	2 30	30	2
	b) Introduction to Business Studies		Lecture		English	2 30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☐	☒
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)

- Introduction to Technology: Students have a basic knowledge and understanding of fundamental processes and concepts from different technological fields. In addition, they are familiar with specific technologies that will change over time, depending on what is currently in the industrial focus
- Introduction to Business Studies: The module covers basics taken from some of the key areas of Business Management: Marketing, Finance, Human Resources Management and Operations Management. Students are familiar e.g. with identifying business opportunities, protecting business ideas and developing a straightforward business plan

Apply (Skills)

- Introduction to Technology: Students are able to express their knowledge in English using the correct technical terminology
- Introduction to Business Studies: Students are able to express their knowledge in English using the correct terminology. Furthermore they are able to present a business plan in an appropriate way to professional audience

Analyze and Evaluate (Competences)

- Introduction to Technology: Students understand the construction and functioning of a number of technical devices and machines
- Introduction to Business Studies: Students have a basic knowledge and understanding of fundamental processes and concepts from the fields of business and economics

5 **Content**
The ***Introduction to Technology*** course provides a grounding in the principal areas of technology. The first section gives an introduction to the basic principles of mechanics and thermodynamics including some applications in the automotive industry. The second section deals with the principles of magnetism and electronics leading up to the development of the computer and other modern communication technologies. The third section focuses on the most recent developments in robotics and its use in industrial areas. Topics discussed include: Engineering materials, classifying engineering processes and machines, units of measurement in engineering. Mechanisms like motion and friction, external and internal combustion engines and engine subsystems, electrochemical and fuel cells and other propulsion types, automobile manufacturing, battery-powered electric cars. Principles of electric circuits, function of electronic devices, circuit symbols, understanding electronic diagrams, circuit protection, radio technology, signal modulation, transmission and reception. Computer technology, basic components, memory, recent developments, robotics and its future potential in industry.

The ***Introduction to Business Studies*** course covers topics taken from some of the key areas of Business Management: Marketing, Finance, Human Resources Management and Operations Management.

Module 0904 Introduction to Technology and Business Studies

	The first section starts with fundamental basics, covering the most important definitions of Business Management and Entrepreneurship. Furthermore the processes of identifying business opportunities, protecting business ideas, developing a business plan and choosing the right legal structure are discussed. The second section deals with Marketing, in particular with formulating marketing objectives, strategies and the corresponding Marketing Mix. In the following section financial basics are discussed, e.g. sources of business finance and calculating revenue, costs and profit. The next section deals with Human Resources Management (HRM): HRM aims and objectives, HRM activities and strategies, recruitment and training and measuring the effectiveness of a personnel department. The last section covers the topic Operation Management with focus on the supply chain and quality management. The sub-module ends with a short excursus about presentation skills.
6	**Participation Requirement** According to study and examination regulations: Proficiency in English corresponding to at least level B2 according to the Common European Framework of Reference for Languages. Typically this involves at least 6 years of learning English. A language user at level B2 „can understand the main ideas of complex text on both concrete and abstract topics. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear and detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options". For more details see: Common European Framework of Reference for Languages Recommended: At least 8 years of studying English
7	**Forms of Assessment** Introduction to Technology: 60 minutes written examination Introduction to Business Studies: min. 10 minutes oral examination (not graded). The oral examination includes a student presentation and questions concerning all topics discussed in the lecture.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Zürn
10	**Literature** Introduction to Technology • An electronic manuscript will be provided. Introduction to Business Studies • An electronic manuscript will be provided. • Recommended literature: Business Studies for A Level, Ian Marcousé, Hodder Education
11	**Contribution to the Program** Automobile manufacturing is a globalized industry with English as its lingua franca. TBB graduates must be able to communicate competently in English on technical and business management issues.
12	**Last Update** 05.02.2018

Module 0905 Introduction to the Automotive Industry

1	**Module no.** 0905	**Major** TAB	**Semester** 1	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 120	**ECTS Credits** 4

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Product Development Process	Lecture with exercises	German	2	30	30	2
	b) Introduction to Automotive Technology and Production	Lecture with exercises	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☐	☐	☒
	Develop and Expand	☐	☒	☐

4 **Learning Outcomes and Competences**

Introduction to Automotive Technology and Production: After successfully completing the module, students will gain a basic understanding of the essential components and functions of vehicles, and segments of automobiles. They will understand arket and customer requirements, the global network of manufacturers and suppliers, and future trends in the automotive sector.

Product Development Processes: After successfully completing the module, students will have a basic understanding of the processes and limiting factors from product development to series maturity. Also, they will understand methods for sustainable quality improvement in development and production, and techniques for controlling key figures along the development process. Futherfmore, they will develop an understanding of possibilities for process structure adaptation (award, cooperation, etc.).

Remember and Understand (Knowledge)

- Introduction to Automotive Technology and Production: A basic understanding of essential components and functions of the vehicle
- Product Development Process: Methods for Sustainable Quality Improvement in Development & Production

Apply (Skills)

- Introduction to Automotive Technology and Production: Design of vehicle and drive systems
- Product Development Process: Techniques for controlling key figures along the development process

Analyze and Evaluate (Competences)

- Introduction to Automotive Technology and Production: Segments of the automobile, plus market and customer requirements
- Product Development Process: Processes & limiting factors for product development up to series maturity

Develop and Expand (Competences)

- Introduction to Automotive Technology and Production: Definition of requirements for products and components in the automotive industry
- Product Development Process: Possibilities for process structure adaptation (assignment, cooperation, etc.) in the automotive sector

5 **Content**

Introduction to Automotive Technology and Production:

- Structure & Components of a Vehicle: General Introduction to Automotive / Body & Interior, Chassis, Brakes and Tires / Drive & Tank System / Electrical, Electronics
- Longitudinal and lateral dynamics: Longitudinal forces (modeling) / tire model / drive model / transverse forces (modeling)

Module 0905 Introduction to the Automotive Industry

	• Drive concepts (introduction): Internal combustion engine / transmission / electric motor / hybrid drive • Sales markets & overview of manufacturers: Global sales markets, sales figures, segments / car manufacturers & suppliers / links within the automotive industry • Technical innovations of the near future: Driver assistance systems & autonomous driving / vehicle networking (car-to-car, car-to-x) / hybrid, electric, fuel cell drive • Globalization and Competitiveness: Future markets in comparison to the triad / changed economic conditions / new business models & mobility concepts Product Development Process: • Concept finding, cost estimation and market forecasts • Product specification, strategic framework • Specification phase / Product development processes for complete vehicle & powertrain • Differentiated according to design, construction / mechanics, electrics & software • Production (pre-) planning of production, assembly & logistics processes • Validation methods of product and production as well as certification as prerequisite for release • Production start-up and operation of markets and aftersales. • Interaction of the individual processes: General information on relationships of processes / overall project planning taking into account all links / variants • Complexity management as a central challenge / optimization approaches under reflection of different goals (quality / maturity, time to SOS, complexity / variant management) • Project Management & Organizational Forms: Individual Functions and Roles of Responsible Persons / Overall Organizational Forms of a Project / Documentation of the Structure Using an AKV or RASIC
6	**Participation Requirement** According to study and examination regulations: Mandatory course in first stage of study Recommended: Mathematics
7	**Prüfungsformen und Voraussetzungen für die Vergabe von Leistungspunkten** One 90 minute exam consisting of both courses, with 45 minutes alotted for each course
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Ralf Wörner
10	**Literature** Basics of Vehicle Technology: • Handbuch der Kraftfahrzeugtechnik, Seiffert, ATZ Fachbuch, 2013 • Nutzfahrzeugtechnik, Breuer, Vieweg Verlag, 2009 • Dynamik der Kraftfahrzeuge, Mischke, Springer Verlag, 2004 • Modellbildung & Simulation der Dynamik von KFZ, Schramm, Springer Verlag, 2013 • Autoelektrik & -elektronik, Reif, Bosch Handbuch Vieweg, 2010 • Bremsenhandbuch, Breuer, Springer Verlag, 2012 Automobile Market: • Funktionale Sicherheit im Automobil, Ross, Vogel Verlag, 2014 • Passive Sicherheit von Kraftfahrzeugen, Kramer, Vieweg Verlag, 2009 • On-Board-Diagnose, Rokosch, Vogel Verlag, 2006 • Darwins Gesetz der Automobilindustrie, Becker, Springer Verlag, 2010 • Verflechtungen der Autobranche, ViaVision, 2012 • Interessensvertreter/Internationalisierung, Teuber, Gabler Verlag 2000 • ACEA Pocket Guide 2016-2017 • Automobilindustrie Deutschland, Statista GmbH, 2016 • Automotive PERFORMANCE 2015, Bratzel, CAM Gelsenkirchen, 2016 Future trends within the automotive industry:

Module 0905 Introduction to the Automotive Industry

	• Automotive Management, Hofer, Springer Verlag, 2015 • Car IT kompakt, Mildner, Springer Verlag, 2015 • Forschung für das Auto von Morgen, Schindler, Springer Verlag, 2008 Processes and Forms of Product Development: • Markenmanagement in der Automobilindustrie, Gottschalk, Gabler Verlag, 2003 • PPS im Automobilbau, Herlyn, Vogel Verlag 2012 • Praxisorientiertes Innovations- & Produktmanagement, Gaubinger, Gabler Verlag 2010 • Preispolitik, Dietz, Vorlesungsmanuskript HS Geisslingen 2012 • Fahrzeugentwicklung im Automobilbau, Gusig, Vogel Verlag, 2010 • Virtuelle Produktentstehung für KFZ, Seiffert, Vieweg Verlag 2014 • Virtuelle Produktentwicklung, Beutner, Vogel Verlag 2013 • Komplexitätskostenmanagement in der Automobilindustrie, Bohne, Gabler Verlag, 1998 • Integrierte Produktentwicklung, Ehrlenspiel, Vogel Verlag, 2009 • Lebenszyklusmanagement in der Automobilindustrie, Specht, Gabler Verlag, 2011 • Konzeptentwicklung & Gestaltung technischer Produkte, Ponn, Springer Verlag, 2014 • Projektmanagement in Automobilindustrie, Hab, Gabler Verlag 2010 Methods for sustainable quality improvement: • Design for Six Sigma, Hünerberg, Gabler Verlag, 2010 • Design for Six Sigma, Lunau, Toolset Springer Verlag, 2009 • Six Sigma Performance Measurement System, Tavasli, Springer Verlag, 2007 • Six Sigma, Töpfer, Springer Verlag, 2003 • Entwicklungsbegleitendes Produktkostenmanagement, Heine, Gabler Verlag, 1995 • Optimierung der Wertschöpfung, Hartmann, ATZ Produktion, 2008 • IV-Controlling, Möller, Gabler Verlag, 2000 • Target Costing für Automobilindustrie, Rößler, Springer Verlag 1996 • Komplexitätskostenmanagement in der Automobilindustrie, Bohne, Gabler Verlag, 1998 • Kostengünstig Entwickeln und Konstruieren, Ehrlenspiel, Springer Verlag, 2014 • Qualität in der Produktentwicklung, von Regius, Vogel Verlag, 2005 Process structure adaptation: • Die strategische Gestaltung der Fertigungstiefe, Djabarian, Gabler Verlag, 2002 • Internationalisierung von F&E und Produktentwicklung, Schlenker, Gabler Verlag 2000 • Internationale Strategische Allianzen in der Automobilindustrie – • Band11 Die Renault – Nissan Allianz, Rietz, Diplomica Verlag, 2012
11	**Contribution to the Program** In this module, students acquire fundamental knowledge in the field of automotive technology and economics. This will develop their understanding of a technical business economist who works in the automotive industry.
12	**Last Update** 05.02.2018

Module 0906 Economics 2

1	**Module no.** 0906	**Major** TAB	**Semester** 2	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 240	**ECTS Credits** 8

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) External Accounting	Lecture with exercises	German	4	60	60	4
	b) Internal Accounting	Lecture with exercises	German	4	60	60	4

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☐	☐	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Advanced and practical knowledge in the theories and principles of accounting, financial statements, cost accounting and other topics listed below in the "Content" section

Apply (Skills)
- Advanced and practical skills in the areas of accounting, financial statements, cost accounting and other topics listed below in the "Content" section. Skills will be needed to solve complex and unpredicatable problems in a specialized work environment

5 **Content**
External Accounting:
- Fundamentals (accounting as an information system, mapping of companies in annual accounts, recording of business transactions on accounts, organizational and legal framework, basic assessments)
- Accounting (booking for the representation of turnover tax, booking in equity and debt capital for the representation of financing processes, booking in fixed assets for the representation of investment processes, bookings in current assets for representation of turnover processes, booking to mapping personnel employment, booking for the representation of taxation)
- Annual Accounts (Closing processes, inventory for the determination of quantity, evaluative final thesis, temporary thesis, preparation of annual financial statements and management reports, analysis of annual financial statements for the purpose of assessing companies)

Internal Accounting:
- Fundamentals (accounting as an information system, calculation parameters, cost characterization, structure and forms of cost accounting systems)
- Costing (Cost Element Accounting, Cost Center Accounting, Cost Object Controlling)
- Income statements (cost of sales accounting, total cost method, one-step contribution margin calculation, multi-level contribution margin calculation)
- Decision calculations (break-even analyzes, product program planning, price determination)
- Control Invoices (Planned Cost, Earned Value Analysis)

6 **Participation Requirement**
According to study and examination regulations:
None

Recommended:
"Introduction to Business Administration"

Module 0906 Economics 2

7	**Forms of Assessment** Two 90 minute exams, one for each course. Module performance will be the weighted average scores on the exams.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Jan Schäfer-Kunz
10	**Literature** External Accounting • Schäfer-Kunz, J.: Buchführung und Jahresabschluss, Schäffer-Poeschl Verlag • Bornhofen, M. u. a.: Buchführung 1 + 2, Springer Gabler Verlag. • Coenenberg, A. u. a.: Jahresabschluss und Jahresabschlussanalyse, Schäffer-Poeschel Verlag. Internal Accounting • Jórasz, W.: Kosten- und Leistungsrechnung, Schäffer-Poeschel Verlag • Coenenberg, A. u. a.: Kostenrechnung und Kostenanalyse, Schäffer-Poeschel Verlag • Friedl, G. u.a.: Kostenrechnung – Eine entscheidungsorientierte Einführung, Verlag Vahlen
11	**Contribution to the Program** This module teaches the accounting knowledge required for a business administration degree
12	**Last Update** 05.02.2018

Module 0907 Fundamental Technology 2

1	**Module no.** 0907	**Major** TAB	**Semester** 2	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Manufacturing Process 2	Lecture	German	2	30	30	2
	b) Machine Elements	Lecture	German	2	30	30	2
	c) Automation Technology	Lecture	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
Automation Technology:

- Understand technical terms of automation technology
- Understand applications and fields of application
- Understand the benefits of automation in the entrepreneurial value creation process
- Understand different evaluation standards for automation
- Understand functional starting points of automation
- Understand the decisive factors influencing automation
- Understand the language, presentation, and systematics for the solution of automation tasks, as well as the available different tools and components
- Assess practical problems
- Carry out simple calculations independently

Manufacturing Process 2:

- Understand functionalities of the individual manufacturing processes of the third, fourth and fifth main group of manufacturing processes (cutting, joining, coating) as well as traditional and innovative manufacturing processes
- Understand the most important relationships and design formulas for cutting processes
- Identify optimization potential during machining
- Understand the current technological development trends in machining
- Understand the interaction of several manufacturing processes in a process chain
- Understand important relationships and interactions of the manufacturing processes to other technical subjects (material science, statics and strength theory, automation technology, machine elements, automotive technology)

Machine Elements:

- Understand the construction of springs and dampers, screw and pin connections, couplings.
- Understand the most important bearing elements such as hydrodynamic plain bearings, hydrostatic plain bearings, rolling bearings and linear guides.
- Understand the construction of gear drives and traction mechanisms (belt + chain).

Apply (Skills)
Manufacturing Process 2:

- Independently perform simple calculations on machining processes

Module 0907 Fundamental Technology 2

	• Identify boundary conditions for the technical and economical use of manufacturing processes in the fields of machining, cutting, joining and coating. Machine Elements: • Perform simple calculations for the design of ME
5	**Content** • Calculation principles for the design of machining processes • Development trends in machining technology • Manufacturing processes involved in coating and joining (glued connection / soldered connection / welded connection / pin and rivet connection / screw connection) • Function and design of basic machine elements, reviewing the most important formulas for their design (springs and dampers, fasteners, screw connections, pin connections, couplings, hydrodynamic plain bearings, hydrostatic plain bearings, roller bearings, linear guides, gear drives, traction drives (belt + chain))
6	**Participation Requirement** According to study and examination regulations: None Recommended: 0902 Fundamental Technology 1, 0903 Mathematik 1, 0905 Introduction to the Automotive Industry
7	**Forms of Assessment** One 90 minute exam consisting of all three courses, with 30 minutes alotted for each course.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr.-Ing. Gerhard Kehl
10	**Literature** • Koether / Rau: Fertigungstechnik für Wirtschaftsingenieure, Hanser-Verlag • Westkämper / Warnecke: Einführung in die Fertigungstechnik, Teubner-Verlag • Haberhauer: Maschinenelemente, Springer-Verlag • N.N: Tabellenbuch Metall, Europa-Verlag • Schmid: Automatisierungstechnik, Europa-Verlag • Seiffert: Handbuch der Kraftfahrzeugtechnik, Vieweg, 2013 • Reik: 10. Schaeffler Kolloquium, 2014 • Roloff/Matek: Maschinenelemente, Springer, 2013 • Braess / Seiffert: Handbuch Kraftfahrzeugtechnik, Vieweg, 2013 • Niemann: Maschinenelemente Band 1+2, Springer, 2001 • Haberhauer: Maschinenelemente, Springer, 2014 • Ten Bosch: Berechnung der Maschinenelemente, Springer, 1953 • Kirchner: Leistungsübertragung in Fahrzeuggetrieben, Springer, 2007
11	**Contribution to the Program** In this module, the students acquire fundamental technical skills and engineering knowledge that broaden their understanding of a technical business economist who works in the industrial environment, at the interface between technical and business areas.
12	**Last Update** 05.02.2018

Module 0908 Mathematics 2

1	**Module no.** 0907	**Major** TAB	**Semester** 2	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 300	**ECTS Credits** 10

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Business Mathematics	Lecture with exercises	German	4	60	60	4
	b) Statistics	Lecture with exercises	German	4	60	60	4
	c) Statistics Lab	Lab	German	1	15	45	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☒	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand the importance of fundamental mathetmatical concepts, formulas, rules, procedures, and ways of thinking outlined below in the "Content" section
- Familiar with typical application examples

Apply (Skills)
- Apply mathematical terms, procedures, formulas, and calculation rules to concrete questions
- Edit statistical issues with Office software

Analyze and Evaluate (Competences)
- Mathematically asssess, calculate, and extropolate solutions for practical application in various fields (economic, technology, etc.)
- Evaluate which mathematical solution is suitable to solve a complex problem

Develop and Expand (Competences)
- Develop problem-solving strategies
- Develop a systematic approach to critical thinking

5 **Content**
Statistics:
- Data collection and cleansing
- Representation of statistical material (feature type, graphical representation, positional and scattering parameters of a random sample)
- Multidimensional Sampling (Correlation and Regression)
- Combinatorics
- Probability calculation (Laplace models, probabilities of composite events, random variables and distribution functions, special distributions such as normal distribution, binomial distribution, Poisson distribution, hypergeometric distribution, random scattering)
- Closing statistics: point estimators, statistical tests and confidence intervals
- Application of statistical methods in quality assurance: quality control charts, process capability indicators, acceptance sampling

Statistics Lab:
- Processing statistical problems with standard software in Office

Module 0908 Mathematics 2

	Business Mathematics: • Continuation of differential and integral calculus, in regards to economic applications: economic functions; determination of Optima, Andler formula; economic interpretation of the derivative (limit functions, elasticity); sales with constant price reduction • Linear system of equations, Gaussian algorithm; internal activity allocation • Linear optimization: mathematical description, graphical solution method; Basic idea of the simplex method • Matrix calculation: matrices, arithmetic operations (addition / subtraction, s-multiplication, multiplication), transpose, inverse; multi-level production process • Functions of multiple variables: mathematical description, intersection curves, partial derivatives, extremes with and without constraints • Financial Mathematics: compound interest formula, cash and final values of cash flows, pension calculation, annuities
6	**Participation Requirement** According to study and examination regulations: None Recommended: • Module 0903 Mathematics 1 • Mathematics knowledge: numerical calculations with fractions, break terms, powers, roots, logarithms, algebraic transformations, sets and functions, properties of elementary functions, equations and inequalities, basic geometric concepts and formulas • Familiarity with a scientific calculator
7	**Forms of Assessment** One 120 minute exam consisting of the three courses. Faculty will provide calculators and will allow the use of items listed below in the "Literature" section. Students can obtain an ungraded certificate in Statistics Lab by completing statistical questions within Office software.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Plappert
10	**Literature** Statistics Lab: • Script • Sammlung von Übungs- und Klausuraufgaben (Intranet) • Sachs: Wahrscheinlichkeitsrechnung und Statistik, Fachbuchverlag Leipzig • Timischl: Qualitätssicherung, Statistische Methoden, Hanser • Monka, Voß: Statistik am PC, Hanser • Mohr: Statistik für Ingenieure und Naturwissenschaftler, Expert Verlag Business Mathematics: • Script • Sammlung von Übungs- und Klausuraufgaben (Intranet) • Mohr: Mathematische Formeln für das Studium an Fachhochschulen • Mohr, Plappert: Einführung in die Mathematik für Wirtschaftsinformatiker, Grenzwert-Verlag
11	**Contribution to the Program** In this module, students will acquire fundamental mathematical and statistical knowledge needed to deal with economic issues.
12	**Last Update** 05.02.2018

Module 0909 Fundamental Business Informatics

1	**Module no.** 0909	**Major** TAB	**Semester** 2	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Business Computing	Lecture with exercises	German	2	30	30	2
	b) Databases	Lecture with exercises	German	2	30	30	2
	c) Business Computing and Databases Lab	Lab	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Describe typical approaches to classify data
- Explain the challenges of managing data
- Represent various data models and the structure of a database system
- Describe various graphical user interfaces of a database
- Explain the normal forms and show the benefits of normalized tables
- Explain the 3-schema architecture according to ANSI / SPARC
- Describe the database languages QBE and SQL

Apply (Skills)
- Defining tables using MS-Access
- Formulate and execute queries using QBE and SQL
- Create screen forms and reports using MS-Access
- Manage and format data with MS-Excel
- Select and apply Excel formulas for evaluation and solution of business issues
- Create and use pivot tables
- Use diagrams to visualize the data
- Look up and register data in other Excel spreadsheets
- Use the Excel Addin Solver to solve optimization problems

Analyze and Evaluate (Competences)
- Decide to what extent and which tool the data should be managed in a business environment

Develop and Expand (Competences)
- Develop solutions for specific operational problems with MS-Excel

5 **Content**
Business Computing:
- Solution of business problems with the help of MS Office products (optimization models, calculation schemes), and data management with the help of MS Excel

Database:
- Data types and data structures, relational database model, data definition, data manipulation and database query with QBE and SQL, creation of database forms and reports

Business Computing and Database Lab

Module 0909 Fundamental Business Informatics

	• Supervised exercises on Business Computing and Databases
6	**Participation Requirement** According to study and examination regulations: None Recommended: 0901 Economics 1, 0928 Mathematics
7	**Forms of Assessment** As part of the Business Computing course, students can obtain an ungraded certificate by completing all specified Excel tasks by hand without errors. The knowledge and skills acquired in the Databases course will be examined in the context of an exam (60 min.), The result of which determines the module grade. As part of the Business Computing and Databases course, students can obtain an ungraded certificate by working on practical tasks with Access.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Hartinger
10	**Literature** • Bilke, P. und Sprung, U., Excel 2010: Die Anleitung in Bildern, Bonn 2011, • Steiner, R., Grundkurs Relationale Datenbanken: Einführung in die Praxis der Datenbankentwicklung für Ausbildung, Studium und IT-Beruf, 8. Auflage, Wiesbaden 2014, • Stern, A., Keine Angst vor Microsoft Access! - für Access 2007 bis 2016: Datenbanken verstehen, entwerfen und entwickeln, 5. Auflage, Heidelberg 2016, • Weikert, A., Access 2010 für Windows - Grundlagen für Anwender, Bodenheim 2011, • Skripte zu den Lehrveranstaltungen
11	**Contribution to the Program** The module teaches the basics of Business Informatics. Dealing with structured databases and evaluating them is one of the key qualifications of technically oriented business economists and is becoming increasingly important in connection with current topics such as Industry 4.0 and Big Data. Spreadsheets and database systems are almost always used as basic tools. The module teaches the handling of such tools and at the same time lays the foundation for the following modules: 0938 Application Systems and 0949 Process Performance Management
12	**Last Update** 05.02.2018

Module 0910 Economics 3

1	Module no. 0910	Major TAB	Semester 3	Offering ☒WS ☒SS	Duration 1 Semester	Module Type Obligatory	Workload (hr.) 300	ECTS Credits 10

2	Courses	Course Style	Language	Frequency (SWS)	(hr.)	Self Study (hr.)	ECTS Credits
	a) Marketing	Lecture with exercises	German	2	30	30	2
	b) Marketing Exercises	Exercises	German	2	30	30	2
	c) Investment and Financing	Lecture with exercises	German	3	45	75	4
	d) Project Management	Lecture with exercises	German	2	30	30	2

3	Qualification Target Matrix	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☐	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand fundamental terms, methods, calculation methods
- Understand typical applications

Apply (Skills)
- Apply methodology to practical situations in the industry – emphasis will be on pratical, not theoretical cases

Analyze and Evaluate (Competences)
- Evaluate respective methodologies
- Draw operational results from method application

Develop and Expand (Competences)
- Develop and assess problem-solving strategies
- Develop team-building and project management skills

5 **Content**
Marketing:
- Understanding the role of Marketing in a company and how it's an engine for growth
- Role of Market research and Business Intelligence in the development of marketing strategies
- Analysis Methods in Marketing & Strategic ventures
- Product positioning in competition
- Formulation of marketing strategies
- Design of sales processes and its intereaction with marketing
- Analysis of business opportunities
- Use of marketing tools

Marketing Exercises:
- Understand the role of marketing in a company
- Development of marketing strategies

Investment and Financing:
- Classify functions of investment and financing in the scope of business administration. Understand

Module 0910 Economics 3

	their significance for different operating processes • Apply fundamental accounting concepts to assess key figures in financial statement analysis • Understand capital market products • Understand specific information using a payment series • Understand the importance of different aspects in investment decision-making • Distinguish between static and dynamic methods of investment accounting • Apply procedures of dynamic investment calculation • Recognize risks associated to an investment decision • Create a business plan. Assign objectives and tasks to estimate the capital requirements of a company • Evaluate the liquidity of a company, and understand the differences between internal and external financing • Understand equity and debt financing as internal and external financing options • Understand funding replacement measures Project Management: • Purpose of projects • Project control and project steering • Understand methods and tools • Application of methodology • Implementation of a team-oriented project management simulation game
6	**Participation Requirement** According to study and examination regulations: Completed first stage of study Recommended: None
7	**Forms of Assessment** One 120 minute exam consisting of the three courses
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Kohlert (MV), Prof. Günther, Prof. Zürn
10	**Literature** Marketing and Marketing Exercises: • Kohlert, Helmut: Marketing für Ingenieure, München 2013 • Kohlert, Helmut: Unternehmensanalyse und strategische Planung, Stuttgart 2016 Investment and Financing • Günther/Schittenhelm: Investition und Finanzierung, Schaeffer Poeschel Project Management • PMI (2013): A Guide to the PROJECT MANAGEMENT BODY OF KNOWLEDGE (PMBOK GUIDE), 5. Dt. Ausgabe • Schelle, H. (2014): Projekte zum Erfolg führen, 7. Auflage, Beck dtv • Jacoby, W. (2015): Projektmanagement für Ingenieure, 3. Auflage, Springer • Dt. Inst. f. Normung (2013): DIN ISO 21500:2013-06
11	**Contribution to the Program** In Economics 3, students learn the necessary knowledge for a technical business administration study in marketing, investment and financing, and project management.
12	**Last Update** 05.02.2018

Module 0911 Fundamental Technology 3

1	**Module no.** 0911	**Major** TAB	**Semester** 3	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Electrical Engineering with Lab	Lecture with exercies	German	2	30	30	2
	b) Kinematics and Kinetics	Lecture with exercies	German	2	30	30	2
	c) Thermodynamics with Lab	Lecture with exercies	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☐	☒
	Develop and Expand	☐	☐	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand basic physical facts and processes in the fields of electrical engineering, physics of motion (kinematics, kinetics), and energy transformation (thermodynamics)
- Understand fundamental terms / terminology
- Understand the use of physical / technical principles in engineering
- Understand the effects of physical laws on the feasibility of technical systems
- Understand physical and functional principles, and the design of sensors
- Learn the correct handling of measurement data

Apply (Skills)
- Recognize basic physical principles behind technical processes and concepts
- Estimate technical requirements for vehicle components and overall concepts
- Master simple measuring tasks and evaluations in the lab

Analyze and Evaluate (Competences)
- Evaluate the technical usability of components as part of an overall concept
- Select measuring method and sensors for a defined measuring task
- Assess the feasibility of mobility concepts in principle

Develop and Expand (Competences)
- Independently develop approaches for new concepts, and assess their suitability
- Expand their prior knowledge with new ideas and topics

5 **Content**
Technical applications typically rely on the conscious use of physical principles. Therefore, the aim of the lecture is the descriptive and quantitative recording of physical phenomena with the help of mathematical methods.

Electric Engineering:
- Focus on DC view
- Physical basics of electrical engineering
- Components: resistance, electrical sources, capacitor, coil, transformer
- Calculation method: Kirchhoff laws, star-triangle transformation,
- Overlay set, replacement sources, basics of AC technology.
- Electrical measurement of mechanical quantities
- Basics of actuators

Module 0911 Fundamental Technology 3

	• Application: Teaching examples, simple practical examples • Exercises on a simulation system on the computer Kinematics and Kinetics: • Elementary mechanics: measurement and units, kinematics, force, momentum, work, energy, power, conservation laws, collision processes, rotational motion, gravity Thermodynamics: • State and measured quantities, ideal gas, kinetic gas theory, heat capacity, state changes, 1st law, cycle, efficiency, thermal and refrigeration machines, heat transfer Lab experiments on the topics addressed, methods of error calculation
6	**Participation Requirement** According to study and examination regulations: Participation in labs are prerequisites for the module exam Recommended: Fundamental Technology 1+2, Mathematics (Statistics)
7	**Forms of Assessment** One 90 minute exam consisting of the three courses, with 30 minutes allotted for each section.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Mack (MV), Prof. Jaeger
10	**Literature** Electrical Engineering: • J. Reth u.a., Grundlagen der Elektrotechnik, Vieweg, Braunschweig, ISBN 3-528-54016-8 • Bauckholt, Grundlagen und Bauelemente der Elektrotechnik, Hanser, München, ISBN 3-446-15246-6 • Moeller u.a., Grundlagen der Elektrotechnik B.G. Teubner Stuttgart, ISBN 3-519-36400-X • Fricke/Vaske, Elektrische Netzwerke, Grundlagen der Elektrotechnik 1, B.G. Teubner Stuttgart, ISBN 3-519-06403-0 Kinematics and Kinetics / Thermodynamics: • Hering, Martin, Stohrer: Physik für Ingenieure, Springer, Heidelberg, ISBN 978-3-642-22568-0 • Tipler, Mosca: Physik für Wissenschaftler und Ingenieure, Springer, Heidelberg, ISBN 978-3-8274-1945-3 • Kuypers: Physik für Ingenieure und Naturwissenschaftler, Band 1, Mechanik und Thermodynamik, Wiley-VCH, Weinheim, ISBN 978-3-527-41135-1 • Müller: Thermodynamik, de Gruyter, Berlin, ISBN 978-3-11-030198-4
11	**Contribution to the Program** Students will receive a fundamental and technical education in the fields of Kinetics / Kinematics, Electrical Engineering and Thermodynamics.
12	**Last Update** 05.02.2018

Module 0912 Computer Aided Design, Computer Aided Manufacturing

1	**Module no.** 0912	**Major** TAB	**Semester** 3	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Computer Aided Design	Lecture	German	2	30	30	2
	b) Computer Aided Manufacturing	Lecture	German	2	30	30	2
	c) CAD/CAM Lab	Lab	German	1	15	45	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☐	☐	☐
	Develop and Expand	☒	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
Computer Aided Design (CAD):
- Foundation and Methods in Design
- Understand CAD methods
- Understand the process from initial drawing to the finished product

Computer Aided Manufacturing (CAM):
- Classification of CAM in the various CAX techniques
- Importance of CAM in the product development process
- Requirements for a CAD / CAM process
- Understanding the technical requirements involved in a CAM operating procedure (eg measuring and control techniques
- Foundations of CNC programming

Apply (Skills)
Computer Aided Design (CAD):
- Solid modeling and Drawing derivation with 3D CAD Systems
- Mastering a 3D CAD system

Computer Aided Manufacturing (CAM):
- Applying CNC programming for simple parts

Develop and Expand (Competences)
- Apply CAD / CAM knowledge to an example project

5 **Content**
- CAD techniques and operating procedures within a 3D CAD system. (Solid modeling, assemblies, drawing derivation)
- CAM techniques, CNC programming

6 **Participation Requirements**
According to study and examination regulations:
Completed first stage of study

Recommended:
None

Module 0912 Computer Aided Design, Computer Aided Manufacturing

7	**Forms of Assessment** One 60 minute exam in Computer Aided Manufacturing (CAM). An ungraded certificate will be awareded in Computer Aided Design (CAD) upon completion of a practical design in the CAD system. The design will include solid modeling and drawing derivation. Ungraded project work in the CAD / CAM Lab consists of creating a CNC program for a given geometry using a CNC programming system or solving a design task using the CAD system.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Sarnitz
10	**Literature** • Kief / Roschiwal / Schwarz: CNC-Handbuch, Hanser-Verlag
11	**Contribution to the Program** In this module, the students acquire fundamental technical skills and engineering knowledge that broaden their understanding of a technical business economist who works in the industrial environment, at the interface between technical and business areas.
12	**Last Update** 05.02.2018

Module 0913 Application Systems

1	Module no. 0913	Major TAB	Semester 3	Offering ☒WS ☒SS	Duration 1 Semester	Module Type Obligatory	Workload (hr.) 120	ECTS Credits 4

2	Courses	Course Style	Language	Frequency (SWS)	(hr.)	Self Study (hr.)	ECTS Credits
	a) Enterprise Resource Planning System	Lecture	German	2	30	30	2
	b) ERP System Lab	Lab	German	2	30	30	2

3	Qualification Target Matrix	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand the structure of an ERP system, including its advantages and disadvantages
- Understand company processes that are mapped in an ERP system
- Understand standard functionalities of ERP systems
- Understand steps necessary to implement and maintain an ERP system

Apply (Skills)
- Use a common ERP system
- Create master data in an ERP system and the impact of errors
- Use business processes in an ERP system through consistent case studies

Analyze and Evaluate (Competences)
- Independently analyze and solve errors
- Evaluate the flow of quantities and values in an ERP system, and select appropriate methods for processing and controlling business processes
- Evaluate processes in a ERP system

Develop and Expand (Competences)
- Acquire the aptitude to use ERP systems. Students will recognize errors and systematically analyze and correct sources of error
- Recognize the business contexts in the ERP system again

5 **Content**
Today many jobs are supported by IT applications, and knowledge of these application and systems are among the key qualifications required of every technical business administrator. This includes the basic understanding of how information is "managed" in the company, and the mapping and analysis of processes in ERP systems.

Enterprise Resource Planning System:
Students will understand the architecture, characteristics, and elements of standard software systems (SSWS) and ERP systems. Furthermore, they will be familiar with steps to introduce SSWS, knowing full well their capabilities, limitations, functionalities and and processes.

ERP System Lab:
Students will use exemplary processes in sales order processing, materials management and production. They will evaluate modules with current SSWS, such as SAP or Oracle.
- Architecture, features, and elements of standard software systems (SSWS)
- Steps in the introduction of SSWS

Module 0913 Application Systems

	• Possibilities, limitations, typical functionalities, and processes supported by SSWS • Example processes in Sales and Distribution (Sales Order Processing), Materials Management (Procurement), and Production Evaluations with current SSWS, such as SAP or Oracle
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: 0906 External Accounting, Fundamental in Logistics
7	**Forms of Assessment** One 90 minute exam. An ungraded certificate will be awareded in ERP System Lab upon completion of practical exercises.
8	**Module Application** Obligatory module in the Bachelor's Program for Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Mathis
10	**Literature** • Script for lectures • SAP-Bibliothek (Hilfefunktion von SAP R/3) • Maassen/Schoenen (2007): Grundkurs SAP R/3, Vieweg, 2007 • Krasser, N.(2015): Success Factors: Grundlagen, Prozesse, Implementierung (SAP PRESS) 2015 • Schulz, O (2016).: Der SAP-Grundkurs für Einsteiger und Anwender: Inklusive Video-Tutorials – Erfolgreich zur Zertifizierung (SAP PRESS) 2016
11	**Contribution to the Program** Fundamental business knowledge from various modules is brought together to demonstrate their interdependencies in routine business transactions and processes
12	**Last Update** 05.02.2018

Module 0914 Quality Management

1	**Module no.** 0914	**Major** TAB	**Semester** 3	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 120	**ECTS Credits** 4
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS) (hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Quality Management		Lecture		German	30	30	2
	b) QM Lab		Lab		German	15	45	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand different Quality concepts
- Understand the emergene and development of Quality Management
- Understand different quality philosophies
- Understand QM tasks in the product life cycle
- Understand the foundations of Metrology

Apply (Skills)
- Apply methods of quality management, e.g. QFD, DFMA, 8D, FMEA, SPC, ...
- Apply selected QM methods in laboratory reports

Analyze and Evaluate (Competences)
- Evaluate orientation types of a quality management system
- Evaluate costs and benefits of quality management
- Analyze quality management systems: DIN EN ISO 9000 ff, EFQM, TQM

5 **Content**
Quality Management Lecture:
Understand the principles of modern Quality Management and important QM methods and procedures.
- Different Quality concepts
- Emergene and development of Quality Management
- Knowing the meaning of different quality philosophies
- QM tasks in the product life cycle and in different divisions
- Methods of quality management, e.g. QFD, DFMA, 8D, FMEA, SPC, ...
- Process orientation of a quality management system
- Costs and benefits of quality management
- Quality management systems: DIN EN ISO 9000 ff, EFQM, TQM

QM Lab:
- Mastery of selected methods and procedures of QM through practice and application
- Understand the foundations of Metrology
- Understand measuring systems and CAQ
- Apply and implement test equipment and test equipment management
- Measure inspection characteristics and create and analyze the SPC control chart
- Use of selected QM methods with laboratory reports

6 **Participation Requirements**
According to study and examination regulations:
None

Module 0914 Quality Management

	Recommended: Foundation in Mathematics or Statistics
7	**Forms of Assessment** One 90 minute exam conditional on completion of QM Lab. An ungraded certificate will be awareded in QM Lab upon completion of practical exercises.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Zürn
10	**Literature** • Herrmann, J.; Fritz, H. (2016): Qualitätsmanagement, 2. überarbeitete und erweiterte Auflage, Carl Hanser Verlag, • Brunner, F.; Wagner K.W. (2016): Qualitätsmanagement – Leitfaden für Studium und Praxis, 6. überarbeitete Auflage, Carl Hanser Verlag Supplementary: • Schmitt, R.; Pfeiffer, T. (2015): Qualitätsmanagement, 5. überarbeitete Auflage, Carl Hanser Verlag • Brüggemann, H,; Bremer, P. (2015): Grundlagen Qualitätsmanagement, 2. erweiterte und überarbeitete Auflage, Springer Verlag
11	**Contribution to the Program** Quality management has in recent years / decades clearly developed from pure quality testing to an important integrative management discipline. Internationally, a company is required to have ISO 9001 certification today in most industrial sectors. TBB graduates therefore need to be thoroughly familiar with the methods and processes of quality management.
12	**Last Update** 05.02.2018

Module 0915 Economics 4

1	Module no. 0915	Major TAB	Semester 3	Offering ☒WS ☒SS	Duration 1 Semester	Module Type Obligatory	Workload (hr.) 180	ECTS Credits 6

2	Courses	Course Style	Language	Frequency (SWS)	(hr.)	Self Study (hr.)	ECTS Credits
	a) Organization	Lecture	German	2	30	30	2
	b) Procurement Management	Lecture	German	3	45	75	4

3	Qualification Target Matrix	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☒	☐	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
Organization:

- Understand what lies behind "organization" in theory and current business practice
- Understand basic technical and methodological knowledge of modern organizational work and will understand the various types of organizational units and concepts
- Understand the essential forms of organizational structure of companies, as well as their respective advantages and disadvantages
- Understand basic concepts and process models of process management
- Gain an overview of the different forms and approaches of planned corporate change

Apply (Skills)
Organization:
Learn to actively shape change in companies as change agents
Deal with resistance and choose between different approaches, models and concepts according to the individual situation of the respective organization and apply them

Analyze and Evaluate (Competences)
Organization:

- Systematically analyze and evaluate backgrounds of organizational problems

Develop and Expand (Competences)

- Develop solutions using techniques of organization

Procurement Management

- Understand the fundamentals of scheduling, purchasing and logistics.
- Understand the terms associated with a supply chain, and apply proper methodology.
- Evaluate the connections between the procurement of raw materials, purchased parts, production, and the final product
- Assess the value chain and rate it according to cost, time and quality
- Evaluate requirements from the supply chain
- Apply methods from disposition and logistics
- Optimize processes and inventories
- Determine required quantities and costs
- Understand interfaces for production and job control
- Use sample exercises to improve methodological competence

5 **Content**

Module 0915 Economics 4

	Organization: • Concept and characteristics of the organization • Foundations and approaches of Organizational Theory • Organizational differentiation and integration • Organizational units as elements of the organizational structure • Organizational concepts of the practice: primary and secondary organization • Process management as a cross-departmental organizational concept • Change Management - Organizing Organizational Change • Techniques of organizational design Procurement: • Foundations and concepts of modern materials management with a focus on procurement (purchasing, scheduling, logistics) in the manufacturing industry • As part of the procurement function, the concepts of materials management, inventory management, order management, order processing, and forecasting procedures will be explored • Concepts will be integrated into a supply chain model • Customer-side production will be taken into account and measured • International supply concepts will be presented and evaluated. • Cost impact, methodological competences, and the requirements for a modern supply chain will be evaluated
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: None
7	**Forms of Assessment** One 90 minute exam consisting of Organization (1/3 weight) and Procurement Management (2/3 weight). 30 minutes will be allotted for the Organization section, and 60 minutes will be allotted for Procurement Management. Module performance will be a weighted score.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Kluck/Prof. Brauner
10	**Literature** Organization: • Vahs, D.: Organisation, Ein Lehr- und Managementbuch, 8. Auflage, Stuttgart 2012 • Vahs, D./Weiand, A.: Workbook Change Management, Stuttgart 2010 Procurement Management: • Kluck, Dieter: Materialwirtschaft und Logistik • Olfert, Klaus: Materialwirtschaft • Wannenwetsch, Helmut: Materialwirtschaft • Arnolds, Hans: Materialwirtschaft und Einkauf
11	**Contribution to the Program** The module enables the students to make strategic and operative decisions in the company on the basis of basic organizational theory and to assess their effects both socially and economically. They can thus objectively evaluate measures for change in the company as well as actively shape them.
12	**Last Update** 05.02.2018

Module 0916 Mobility and Sustainability Production

1	**Module no.** 0916	**Major** TAB	**Semester** WS/SS	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 240	**ECTS Credits** 8

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Mobility Concepts	Lecture	German	2	30	90	4
	b) Sustainability Management in Production	Lecture	German	3	45	15	2
	c) Drive Systems	Lecture	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☐	☒	☐
	Analyze and Evaluate	☐	☐	☐
	Develop and Expand	☒	☐	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
Mobility Concepts:
- Understand regulatory interventions (emission or prohibition zones, StVOG amendment) and infrastructural measures taken by the public sector (P & R / P & M Concepts, Public & Mobility Grid)
- Understand individual traffic, and new energy supply concepts

Sustainability Management in Production:
- Understand production processes, productivity, costs in industrial operations
- Identify the structure and function of a factory

Drive Systems:
- Understand the design of conventional powertrains (internal combustion engine, transmission and peripherals)

Apply (Skills)
Mobility Concepts:
- Logistic connections of individual traffic in the form of user profiles and traffic flows. Understand their consequences (congestion, penetration of parking areas, accidents, emissions, energy requirements ...) in urban areas

Sustainability Management in Production:
- Capacity (capacity requirements and stock)
- Identify the need for employees and machines

Drive Systems:
- Design conventional powertrains (combustion engine, transmission and periphery), and alternative drive technologies

Analyze and Evaluate (Competences)
Mobility Concepts:
- Evaluate the effect of sociological patterns of behavior, and population in metropolitan areas and their growth, on traffic and mobility behaviors

Sustainability Management in Production:
- Assess solutions by cost (€) and lead time (min)

Module 0916 Mobility and Sustainability Production

	• Evaluate deviations in production systems Drive Systems: • Describe / define infrastructural measures to support market empowerment of new propulsion technologies with alternative energy sources **Develop and Expand (Competences)** Mobility Concepts: • Innovations / methods to avoid the problems of increasing individual traffic based on C2x networking, driver assistance systems, and car or mobility sharing models Sustainability Management in Production: • Record and evaluate lean manufacturing processes • Understand lean production and manufacturing • Develop an understanding of a lean factory Drive Systems: • Specify ways to revise powertrain, taking into account alternative drive technologies (hybridization / electrification & efficiency enhancement of existing drives)
5	**Content** Mobility Concepts: • Description & Prediction of traffic flow: description of observed traffic flow / mathematical modeling of traffic flow / analysis of traffic in practical cases and their consequences regarding traffic jams & accidents • Mobility behavior in postindustrialized society: diversified mobility offers & individual user profile / change in population density & infrastructure in urban areas / consequences for traffic volume, emission load. • Regulatory interventions by legislators: emission requirements (individual target values, emission zones, etc.) / (Fleet) consumption specifications & taxation instruments / other changes to legislation (eCall, etc.) • Infrastructural measures: adaptation of traffic planning (flexibilisation / diversification) / consideration of new energy supply / tank systems / standardisations, standards & legislative amendments • Assistance systems: Requirements for partial automation of a vehicle (E / E architecture, mechatronic components, sensors, SG'e) / control systems for automated vehicle dynamics control (ABS / ESP, Parking / Lane Departure Assist, Adaptive Cruise Control) / Collision Preventive Safety Functions / (AEBS, Pre-crash / Airbag Systems, Impact Protection Systems, eCall) / Navigation Systems (Map-based route guidance, traffic information, etc.) / Outlook: Autonomization of the vehicle (Environment detection, driving strategies, applications) • Car Connectivity: Basic Considerations for Interface Interfaces (HMI-SS: Keys, Gestures, Language, Mobile Devices, Car2x-Connect, ...) / Selected Applications for Car2x Connectivity (eCall, Remote Diagnosis / Update, Route Info, Car2Car Networking) / New degrees of freedom through mobile devices (Data comparison / mirroring, WWW access, functional extension d. App) • Outlook - Shared Mobility: Car-Sharing as an Extension of the Leasing Concept / Modern Form of Carpooling: Ride-Sharing Offers / Networking of Offers from Private and Public Transport / The Alternative Hydrogen: Supply & Refueling Models Sustainability Management in Production: • Definition of Sustainability from the point of view of production • Cost theory in production • Production theory (process principles, production / assembly processes, lead times, etc.) • Capacity analysis (demand and inventory) • Order control in production • Necessary fields for sustainability in production: • Energy efficiency, energy recovery, building insulation, quality assurance, ergonomics, • TPS, service life, factory new building, transformable factory • Factory planning: location, product range, material flow concepts, key figures, investment assessment, profitability, checklists and risk assessment

Module 0916 Mobility and Sustainability Production

	Drive Systems: • Execution of conventional engines: General characterization of the reciprocating engine (cycle calculation & determination of engine forces / combustion engine I - the gasoline engine / internal combustion engine II - the diesel engine / essential methods of exhaust aftertreatment / fundamentals of the transmission and drivetrain design / others: periphery of the powertrain (cooling, recuperation) • Existing and Future Legislative Requirements: Overview of Global Emission and OBD Regulations (Emission Components, Driving Cycles, Measurement Procedures, Limits) / Future Fuel Consumption Specifications for Fleet & Single Registration (Metering, Fleet Consumption & Taxation) • Hybridization of the powertrain: Principles of (partial) electrification & consequences for vehicles / Micro and mild hybrid concepts: Structure & Potentials / Full-Hybrid & Plug-In Drives: Features & Consequences • Switching to a purely electromotive drive: Essential requirements: Range, performance capabilities / design forms & characteristics of different electric motors / Energy supply by battery, fuel cell, range extender / other: Requirements for durability and crash safety • Comprehensive balancing of energy efficiency: Well to Wheel balancing and Sankey diagram / Energy flows & Efficiency losses for various drive concepts / Conclusions for sustainable energy • Industry & mobility adapted forms of energy supply: electricity as an energy source: charging concepts & infrastructure
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: Procurement management, Manufacturing Technology, Introduction to Automotive Technology, Drive Systems
7	**Forms of Assessment** One 120 minute exam consisting of all three courses.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Dieter Kluck
10	**Literature** **Mobility Concepts:** General introduction to forms of mobility: Elektromobilität im motorisierten Individualverkehr, Bertram, Springer Verlag, 2014, Strategien der Automobilindustrie zur Reduktion von Flottenemissionen, Wansart, Springer, 2012 Traffic Considerations: Verkehrswesen – Praxis (Band 2), Höfler, Bauwerk Verlag, 2006**,** Einführung in die Verkehrsplanung, Köhler, IRB Verlag, 2013**,** Dynamische Umlegung mit makroskopischen Verkehrsflussmodell, Aleksic, Springer Verlag 2015**,** Stadtverkehrsplanung, Vogt, Springer Verlag, 2005**,** Verkehrsdynamik & Simulation, Treiber, Springer Verlag, 2010**,** Verkehrsunfallanalyse, Statistisches Bundesamt, 2014**,** Mobilität in Deutschland, Studie DLR, 2008 **,** Limits & Measuring Methods for LDV Emission Regulation China 6, Drafting Group, 2016 Regulatory and infrastructural measures**:** Limits for LDV Emissions Regulation China 6, Drafting Group China, 2016

Module 0916 Mobility and Sustainability Production

	Mobility innovations & applications in the automotive industry: Fahrstabilisierungs- & Fahrerassistenzsysteme, Reiff, Vieweg, 2010, Handbuch Fahrerassistenzsysteme, Winner, Springer Verlag, 2012, Fahrerassistenzsysteme & effiziente Antriebe, Siebenpfeiffer, Springer Verlag 2015, Integrale Sicherheit von Fahrzeugen, Kramer, Springer Verlag, 2013, Telematik im Straßenverkehr, Müller, Springer Verlag, 1995, Autonomes Fahren, Maurer, Springer Verlag, 2015 Die digitale Evolution moderner Großstädte, Jaekel, Springer, 2013, Vernetztes Automobil, Siebenpfeiffer, Springer Verlag, 2015, Car IT kompakt, Johanning, Springer Verlag, 2015 **Sustainability Management in Production:** Baumast: Betriebliches Nachhaltigkeitsmanagement, Hasenmüller: Herausforderungen im Nachhaltigkeitsmanagement, Bozem: Energie für nachhaltige Mobilität, REFA: Methodenhandbuch, Zahn/Schmid: Produktionswirtschaft, Corsten: Produktionswirtschaft, Hoitsch: Produktionswirtschaft Tempelmeier: Produktion und Logistik, Bullinger: Arbeitsgestaltung, REFA: Arbeitsgestaltung in der Produktion, VDI: Arbeitsgestaltung und Arbeitsorganisation, Ebel: Produktionswirtschaft, Bosch: Produktionssystem, Schmigalla: Fabrikplanung, Grundig: Fabrikplanung, Wiendahl: Fertigungssteuerung **Drive Systems:** Motivation for the Drive Offensive & Historical Review: Handbuch Verbrennungsmotoren, Basshuysen, Springer, 2015, Energieeffiziente Antriebstechnologien, Siebenpfeiffer, Springer, 2013, Handbuch der Kraftfahrzeugtechnik, Braess, ATZ Fachbuch, 2013, Die Ära Gottlieb Daimler, Seiffert, Vieweg Verlag, 2009 Properties & design of conventional drives: Grundlagen der Verbrennungsmotoren, Merker, ATZ Fachbuch, 2014, Otto-_und_Dieselmotoren, Grohe, Vogel 2014, Kraftfahrzeugantriebe, Geringer, Manuskript TU Wien, 2013, Schritte in die künftige Mobilität, Proff, Springer Verlag, 2013 Alternative drive technologies: Elektrifizierung des Antriebsstranges, Wallentowitz, Vieweg, 2010, Alternative Antriebe für Automobile, Stan, Springer, 2015, Hybridantriebe und konventioneller Antriebsstrang, Reif, Vieweg, 2010, Kraftfahrzeug-Hybridantriebe, Noreikat, Springer, 2012, Hybridfahrzeuge, Hofmann, Springer, 2010, Elektromobilität, Schnettler, Springer Verlag, 2011, Handbuch Lithium-Ionen-Batterien, Korthauer, Springer Verlag, 2015 New infrastructure as a pioneer of sustainable evolution: Wasserstoff in der Fahrzeugtechnik, Eichlseder, Springer, 2012, Elektromobilität - Hype oder Revolution, Lienkamp, Springer, 2012, Handbuch Lithium-Ionen-Batterien, Korthauer, 2013, Praxisbericht Elektromobilität & Verbrennungsmotor, Lenz, Springer, 2016, Ein Portfolio von Antriebssystemen fuer Europa, McKinsey, 2015, Analyse von Strategien der Automobilindustrie zur Reduktion von Flottenemissionen, Wansart, Springer, 2012, Elektromobilität im motorisierten Individualverkehr, Bertram, Springer, 2014
11	**Contribution to the Program** In this module students acquire fundamental knowledge in the fields of mobility, drive technology and sustainability in production. This will develop their understanding of a technical business economist who works in the automotive industry.
12	**Last Update** 05.02.2018

Module 0917 Process Management

1	**Module no.** 0917	**Major** TAB	**Semester** 4	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Methods of Process Management	Lecture with exercises	German	2	30	30	2
	b) Process Planning	Lecture with exercises	German	2	30	30	2
	c) Processes of Product Development	Lecture with exercises	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☐
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☒	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Learn various traditional and current methods for documentation and analysis of processes, and understand in which cases they should be applied
- Explain criteria for designing companies and processes under process- and customer-oriented aspects

Apply (Skills)
- Apply methods to document processes
- Summarize tasks according to customer and process criteria, and derive organizational units and requirements for job creation

Analyze and Evaluate (Competences)
- Define process-related key figures
- Analyze and evaluate processes
- Recognize and evaluate weak points in processes
- Develop target and problem-oriented solutions for process improvement

Develop and Expand (Competences)
- Apply new methods of process management and deepen fundamental organizational knowledge
- Gain internal accounting and controlling knowledge as part of process evaluations and activity-based costing
- Apply prior knowledge from different modules in a new way
- Develop team-building skills through cooperation and competition
- Expand their social competences through presentation of group work

5 **Content**
Holistic process management encompasses both the design aspect of process planning and the components of process validation in terms of process control and monitoring. In addition to the general methods of process planning and validation there are special task areas such as Logistics, in which typical scenarios and processes are represented by different aggregation levels. Using these process models, the students will use concrete case studies to understand how to implement a holistic process management approach

Methods of Process Management:
- Understand business processes. Merge typical corporate tasks into processes in a goal-oriented and purpose-oriented manner

Module 0917 Process Management

	• Understand the structure and design criteria of a company from a process perspective. • Learn to break down processes and tasks according to different analysis criteria and to group them into different organizational forms within the scope of a task synthesis. • A thematic focus is the analysis and evaluation of (business) processes. To this end, students will learn different methods via case studies and apply them in a goal-oriented and problem-oriented way • Understand how to plan and map processes in a goal-oriented manner. From the strategic goals of the company, process goals are derived and key figures for these processes are defined. Process Planning: With a provided system environment, the participants will gain practical experience in the evaluation and visualization of business processes and their properties. They will learn how decisions-relevant relationships can also be automatically recognized (partially) with the aid of classic key figure approaches in the context of process management. • Students learn the basic characteristics of processes, as well as different methods for mapping processes across different levels of planning and controlling so that a hierarchically structured process map is created • Depending on various objectives, students will derive typical metrics for assessing and controlling processes. Moreover, they will develop approaches to improve processes • During the course of the lecture, exercises will be carried out using standard software programs. Process models will be created and evaluated as an example Processes of Product Development • Understand the processes that take place during product development • Apply methods and tools for development and design according to VDI 2221 and VDI 2222 • Apply their understanding in an individual development project
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: Internal accounting, Controlling and Organizational knowledge
7	**Forms of Assessment** One 90 minute exam (weight 2/3) consisting of Methods of Process Management and Process Planning. 45 minutes will be allotted for each section. One development project for the Processes of Product Development course (weight 1/3). Module performance will be the weighted score of these two assessments.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Mathis
10	**Literature** Fundamentals of Process Planning and Management: • Gadatsch, A. (2012): Grundkurs Geschäftsprozess-Management: Methoden und Werkzeuge für die IT-Praxis: Eine Einführung für Studenten und Praktiker, 7. Aufl., Vieweg+Teubner Verlag 2012 • Gadatsch, A. (2015): Geschäftsprozesse analysieren und optimieren (essentials), Springer Vieweg 2015 • Gladen, W.: Performance Measurement, Gabler Wiesbaden 2008 • Becker, J.; Kugeler, M.; Rosemann, M.: Prozessmanagement, Springer Berlin u.a. 2005 • Schmelzer; H.; Sesselmann, W.: Geschäftsprozessmanagement in der Praxis, Hanser 2010 • Prozessvalidierung: Gabriel, R., Gluchowski, P. und Pastwa, A., Datawarehouse & Data Mining, Herdecke u.a. 2009. Supply Chain Management: • Burkhardt Funk, Jorge Marx Gómez, Peter Niemeyer, Frank Teuteberg: Geschäftsprozessintegration mit SAP : Fallstudien zur Steuerung von Wertschöpfungsprozessen entlang der Supply Chain, Berlin,

Module 0917 Process Management

	Heidelberg : Springer-Verlag Berlin Heidelberg, 2010 Processes of Product Development: • Pahl/Beitz: Konstruktionslehre – Grundlagen erfolgreicher Produktentwicklung, Springer-Verlag 2006 • VDI 2221: Methodik zum Entwickeln und Konstruieren technischer Systeme und Produkte 1993 • VDI 2222: Methodisches Entwickeln von Lösungsprinzipien, 1997 → hierzu bitte noch einmal Dr. Wörner befragen
11	**Contribution to the Program** After the module, students will recognize organizational problems. They will be able to select appropriate solution methods, analyze problems, and develop targeted solutions. Moreover, they will be able to coordinate in a team, and present their results in a professional manner.
12	**Last Update** 05.02.2018

Module 0918 Automotive Industry

1	**Module no.** 0918	**Major** TAB	**Semester** 4	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 180	**ECTS Credits** 6

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Automotive Sales	Lecture with exercises	German	4	60	60	4
	b) Business Law	Lecture	German	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☐
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☒	☒	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand automotive distribution and classification in the context of marketing
- Understand customer relationship in the automotive industry
- Understand the development of sales strategies and distribution systems for car manufacturers
- Understand management of sales organizations in the automotive sector
- Understand critical success factors in the distribution of automobiles
- Understand fundamentals of commercial law (legal norms)
- Understand commercial transactions
- Understand legal forms and cases

Apply (Skills)
- Understand how to conduct a case study (group work) to develop a distribution system
- Learn strategy and sales measures
- Learn data acquisition, presentation, evaluation and strategy derivation methods
- Determine of facts in reference to the appropriate legal norms of the WiRE

Analyze and Evaluate (Competences)
- Analyze markets (customer, competition and environment)
- Analyze companies
- Evaluate legal situations (facts, conditions, influences)
- Assess state of affairs and determination of relevant legal norms / principles

Develop and Expand (Competences)
- Conduct market analysis (case study)
- Develop sales strategy and corresponding implementation measures (case study)
- Develop intercultural and social competence in the context of group work (case study)

5 **Content**
Automotive Sales:
- Fundamentals and terms in automotive distribution
- Understanding the fundamental concepts in sales
- Importance of sales in the industrial environment
- Strategic and operative management in automotive distribution
- Customer relationship process
- Market analysis (customer, competition, environment)
- Formulation of sales strategies for OEMs (design of distribution systems, derivation of strategic sales activities)
- Operational management and control of sales organizations in the automotive industry

Module 0918 Automotive Industry

	• Success factors in automotive sales • Treatment / implementation of practical examples and case studies for practice-oriented mediation of issues in the distribution of automobiles Business Law: Students will understand business law issues through practice and develop their own understanding in the following topics: • Foundations of Civil, Commercial, and Company law • Debt and Property law • Commercial transactions and Commercial businesses • Partnership and Corporation laws • Drafting of company contracts
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: Marketing, Introduction to Business Administration
7	**Forms of Assessment** One 90 minute exam in Automotive Sales (2/3 weight) and Business Law (1/3 weight). Module performance will be the weighted score. 60 minutes will be allotted for Automotive Sales and 30 minutes will be allotted for the Business Law section. Module performance will be a weighted score.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Burmester
10	**Literature** • Vertriebskonzeption, Winkelmann • Professionelles Vertriebsmanagement, Hofbauer/Hellwig • Sales Excellence – Vertriebsmanagement, Homburg/Schäfer/Schneider • Marketing-Management, Kotler • Vertriebsmanagement, Reichwald/Bullinger (Hrsg.) • Verkaufsmanagement, Weis
11	**Contribution to the Program** Students will understand the function of sales in the context of operational value creation of an automobile company. Students will understand the legalities surrounding economic activity and business transactions.
12	**Last Update** 05.02.2018

Module 0919 Project

1	Module no. 0918	Major TAB	Semester 4	Offering ☒WS ☒SS	Duration 1 Semester	Module Type Obligatory	Workload (hr.) 120	ECTS Credits 4
2	Courses		Course Style		Language	Frequency (SWS) (hr.)	Self Study (hr.)	ECTS Credits
	a) Project		Project		German or English	x 30	80	4

3	Qualification Target Matrix	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☐	☐	☐
	Apply	☐	☒	☒
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☒	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Remember and apply TAB knowledge from previous semesters

Apply (Skills)
- Resolve scientific and technical issues, taking into account economic, environmental, safety and ethical aspects
- Develop a scientific foundation to work on a project
- Plan time, effort, and resources
- Independently learn new technologies and methods
- Document results in a clear and understandable way
- Independently research, and if needed, interview with experts

Analyze and Evaluate (Competences)
- Assess and evaluate their processes
- Assess and evaluate their results

Develop and Expand (Competences)
- Use learned methodologies to propse and implement solutions

5 **Content**
Project
Having learned fundamental scientific principles, students will develop a project within a deadline. This will require research, and if needed, discussions with experts
This will include:
- Development, concretization and agreement of the project with the supervisor
- Creation of a schedule
- Research and discussions with experts
- Execution of tasks according to the schedule
- Presentation of the project to the supervisor, and possibly a plenary session

6 **Participation Requirements**
According to study and examination regulations:
Completed all examss in the first stage of study

Recommended:
Completion of all exams from Semesters 1-4

7 **Forms of Assessment**
Project work will be presented to a supervisor and plenary, who will assign a grade.

Module 0919 Project

8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Ralf Wörner
10	**Literature** • Stein, F. (2007): Projektmanagement für die Produktentwicklung, Expert Verlag, 2007 • Maddauss, B. (2009): Handbuch Projektmanagement, Schäffer-Poeschel Verlag, 2009 • Kupper, H (2001): Die Kunst der Projektsteuerung, Oldenburg Verlag, 2001 • Kornmeier, M. (2008): Wissenschaftlich schreiben leicht gemacht für Bachelor, Master und Dissertationen, 6. Auflage, Bern 2013 • Joachim Stary, Die Technik wissenschaftlichen Arbeitens. Eine praktische Anleitung, Band724 von Uni-Taschenbücher, 2013 • Andermann, Drees, Duden – Wie verfasst man wissenschaftliche Arbeiten? Ein Leitfaden für das Studium und die Promotion; 3. Auflage, 2006 • Carlike, P./ Christensen, C.(2005): The cycles of Theory Building in Management Research, Working Paper, Boston 2005 • Bortz, J. Döring, N (2001). Forschungsmethoden und Evaluation, Springer Verlag
11	**Contribution to the Program** Students will acquire interdisciplinary knowledge necessary to carry out a scientific project. They will learn to structure their work in a presentable manner, and organize themselves in a manner in which they can critically question and evaluate the quality of their work.
12	**Last Update** 05.02.2018

Module 0920 Business Simulation

1	**Module no.** 0920	**Major** TAB	**Semester** 5	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 120	**ECTS Credits** 4
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS)** **(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Business Simulation		Exercises		German	2 30	30	2
	b) Exercises in Economics		Project		German	-	60	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☒
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☒	☐	☐

4 **Learning Outcomes and Competences**

- Business Simulation: Participants will guide a fictitious simulation game company by analyzing accounting reports and independently developing key business decisions in a competitive market environment
- Exercises in Economics: Participants will penetrate an economic problem / phenomenon / question in order to analyze its pros and cons in detail. A scientifically sound opinion on the proposed solutions will be evaluated

Remember and Understand (Knowledge)

- Business Simulation: Previously learned theories of Business Administration must be exercised during the simulation game, as knowledge is refined through practical example
- Exercises in Economics: Reactivation of micro and macroeconomic knowledge and its application to a current economic problem

Apply (Skills)

- Business Simulation: Application of contents and theories of Business Administration
- Exercises in Economics: All acquired economic knowledge should be used in the evaluation and analysis of the given chains of reasoning

Analyze and Evaluate (Competences)

- Business Simulation: Analysis and evaluation of company reports and Macroeconomic requirements
- Exercises in Economics: Chains of reasoning will be examined and assessed for their plausibility, stringency and, if necessary, their feasibility from an economic, social and practical point of view.

Develop and Expand (Competences)

Business Simulation:

- Participants will understand the complexity of business contexts and learn how to organize, plan, control, analyze deviations, and steer according to the company's goals.
- Participants will understand important aspects of the macroeconomic environment of the German and European economies. They will classify important social developments and assess different economic alternatives

5 **Content**

Business Simulation:

- Practical experience in entrepreneurial thinking and decision-making
- Practice and deepen business knowledge in a simulative corporate context
- Lead a company, making business decisions over several business periods, and analyzing the entire

Module 0920 Business Simulation

	operational reporting system • Development of individual case studies for product costing, cost object accounting, activity-based costing, marketing, and investment decisions Exercises in Economics: • Assessment of Macroeconomic processes and problematic situations • Application of economic knowledge to assess economic and social situations
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: Economics, Accounting I+II, Introduction to Business Administration
7	**Forms of Assessment** An ungraded certificate will be awareded in Business Simulation upon completion of the simulation game and all relevant coursework. Following completion of the simulation game, one project about an economic topic will be assessed for the Exercises in Economics course.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Prof. Dr. Jäger
10	**Literature** • Teilnehmerhandbuch Topsim – General Management • Gregory Mankiw: Grundzüge der Volkswirtschaftslehre • Gregory Mankiw: Makroökonomik • Diverse Videovorträge
11	**Contribution to the Program** Useful economic knowledge for all who meet the requirements.
12	**Last Update** 05.02.2018

Module 0921 Practical Study Semester

1	Module no. 0921	Major TAB	Semester 5	Offering ☒WS ☒SS	Duration 1 Semester	Module Type Obligatory	Workload (hr.) 780	ECTS Credits 26
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS) (hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Occupational Experience		Internship			720	0	24
	b) Audit Practice Semester		Seminar		German	15	45	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☐	☐
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☒	☒
	Develop and Expand	☒	☒	☒

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Classify tasks in the right subject areas
- Acquire and deepen specialist knowledge in the specific areas of the practice

Apply (Skills)
- Apply learned skills and methods in practice

Analyze and Evaluate (Competences)
- Evaluate solutions

Develop and Expand (Competences)
- Acquire social competence through dealings with supervisors and colleagues
- Understand how to communicate within a company
- Own a project and gain responsibility and confidence
- Create an application

5 **Content**
In the practical study semester, students apply the scientific methods and procedures taught during their studies to tasks in the professional world. They acquire practical experience during their employment and thus directly prepare themselves for future professional activity. They'll work in a company or other professional facility with at least 100 attendance days and write a report about their experience. At the end of the practical study semester, students will reflect on their newly acquired theoretical and practical knowledge. They will critically assess the procedures and processes in place during their internship, and will receive feedback on their performance.

6 **Participation Requirements**
According to study and examination regulations:
Passed Bachelor's Program Preliminary Exam

Recommended:
All modules of the first four semesters.
Because the practical semester is required before commencing the Bachelor thesis, it should be completed in the 5th semester according to SPO (study and examination. Since the evaluation of the practical study semester will take time, a 6th semester is required as a subsequent theoretical semester. Otherwise, there may be delays in starting the bachelor thesis.

7 **Forms of Assessment**
Proof of at least 100 days of attendance in a suitable internship, carrying out acceptable activities listed under the Internship Policy

Module 0921 Practical Study Semester

	Written report approved by the Internship Office, in accordance with the provisions of the Internship Policy Report uploaded to university website Internship presentation and participation in the course "Audit Practical Semester"
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB).
9	**Lecturer / Responsible for the Module** Prof. Dr.-Ing. Gerhard Kehl
10	**Literature** Bachelor Internship Policy on the faculty website
11	**Contribution to the Program** Students will acquire practical experience and knowledge to supplement their courses on the essential activities of technical business economists. As part of their occupational experience, they actively carry out economic and / or technical work for a substantial part of the employment period.
12	**Last Update** 05.02.2018

Module 0922 Economics 5

1	**Module no.** 0925	**Major** TAB	**Semester** 6	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 300	**ECTS Credits** 10

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Controlling	Lecture with exercises	deutsch	3	45	75	4
	b) Personnel Management	Lecture with exercises; Project	deutsch	2	30	90	4
	c) Interpersonal and Intercultural Skills	Seminar	englisch	2	30	30	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☒	☒	☒
	Apply	☒	☒	☒
	Analyze and Evaluate	☒	☒	☐
	Develop and Expand	☐	☐	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Describe the functions and tasks of controlling and place them in the context of the overall company
- Name and describe the most important controlling methods
- Name and describe psychological models and theories of leadership
- Gain insight into different managerial skills
- Understand fundamental principles and theories of intercultural communication and management

Apply (Skills)
- Understand the behavioral impacts of controlling methods
- Apply controlling tools to operational decisions
- Use psychological models and theories of leadership to explain behavior
- Recognize which skills should be applied in a given situation
- Realize which strategies and skills are involved in the leadership and management of multicultural teams

Analyze and Evaluate (Competences)
- Analyze the results of a given controlling method, derive control and behavioral effects, suggest solutions, and report them in a structured and justifiable way
- Apply different techniques of personnel management and develop problem-solving approaches
- Analyze social and cultural impacts in managerial decisions

Module 0922 Economics 5

5	**Content** Controlling: • Students will learn controlling methodology and apply them in a professional context • Cost management methods will be evaluated • Control invoices and deviation analysis will be evaluated • Coordination problems in decentralized companies will be discussed • Controlling methods in regards to budgets, key metrics, and transfer prices will be evaluated Personnel Management: • Theories and concepts of personnel management (Motivation theories, leadership models and styles, leadership techniques, leadership) • Employee behavior and group work • Regular and event-dependent employee appraisals (organizational and content preparation, discussion and feedback rules, discussion guidelines, reasoning techniques) Interpersonal and ontercultural skills: • Fundamental principles and theories of intercultural communication and management • Fundamental principles associated with interpersonal skills • Relationships between the cultural and corporate environments
6	**Participation Requirements** According to study and examination regulations: Completed first stage of study Recommended: None
7	**Forms of Assessment** One 90 minute exam (4 credits), and one project (4 credits) and its presentation (2 credits). Module performance will be the weighted average scores on the assessments.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB).
9	**Lecturer / Responsible for the Module** Prof. Dr. rer. pol. Oliver Dürr

Module 0922 Economics 5

10	**Literature** Controlling: • Coenenberg, A.G. / Fischer, T.M. / Günther, T. (2016): Kostenrechnung und Kostenanalyse, 9. Auflage, Stuttgart, Schäffer-Poeschel • Ewert, R. / Wagenhofer, A. (2014): Interne Unternehmensrechnung, 8. Auflage, Berlin, Springer • Fischer, T.M. / Möller, K. / Schultze, W. (2015): Controlling: Grundlagen, Instrumente, Entwicklungsperspektiven, 2. Auflage, Stuttgart, Schäffer-Poeschel • Horváth, P. / Gleich, R. / Seiter, M. (2015): Controlling, 13. Auflage, München, Vahlen • Küpper, H.-U. / Friedl, G. / Hofmann, C. / Hofmann, Y. / Pedell, B. (2013): Controlling: Konzeption, Aufgaben, Instrumente, 6. Auflage, Stuttgart, Schäffer-Poeschel • Reichmann, T. / Kißler, M. / Baumöl, U. (2016): Controlling mit Kennzahlen: Die systemgestützte Controlling-Konzeption, 9. Auflage, München, Vahlen Personnel Management: • Becker, F.G. (2016): Personalentwicklung, 6.Auflage, Stuttgart:Schäffer-Poeschel • Bröckermann, R. (2016): Personalwirtschaft - Lehr- und Übungsbuch für Human Resource Management 7. Auflage, Stuttgart:Schäffer-Poeschel • Holtbrügge, D. (2012): Personalmanagement, 5. Auflage, Springer Gabler Verlag • Kolb, M. (2010): Personalmanagement, Grundlagen - Anwendung – Umsetzung, 2.Auflage, Gabler Verlag • Neuberger, O. (2002): Führen und führen lassen, 6.Auflage, Lucius & Lucius UTB • Rosenstiel, l. v. u.a. (2014): Führung von Mitarbeitern - Handbuch für erfolgreiches Personalmanagement, 7. Auflage, Stuttgart:Schäffer-Poeschel • Rosenstiel, L. v. / Nerdinger, F.W. (2011). Grundlagen der Organisationspsychologie, 7. Auflage, Stuttgart:Schäffer-Poeschel • Scholz, C. (2013): Personalmanagement: informationsorientierte und verhaltenstheoretische Grundlagen, 6. Auflage, Vahlen • Sprenger, R. (2002): Mythos Motivation - Wege aus einer Sackgasse, Campus Verlag • Wunderer, R. (2011): Führung und Zusammenarbeit: eine unternehmerische Führungslehre, 9. Auflage, Hermann Luchterhand Verlag Interpersonal and Intercultural Skills: • Robbins, S.P. / Hunsaker, P.L. (1996): Training in Interpersonal Skills, 2. Auflage, Upper Saddle River, Prentice Hall • Johnson, R.A. (1993): Negotiation Basics, Newbury Park, Sage • McRae, B. (1998): Negotiating and Influencing Skills, Newbury Park, Sage • Hofstede, G. (1997): Cultures and Organisations: Software of the Mind, New York, McGraw-Hill • Hall, T. (1989): Beyond Culture, New York, Doubleday • Bartlett, C.A. / Ghoshal, S. / Birkinshaw, J.M. (2004): Transnational Management, New York, McGraw-Hill • Jacob, N. (2003): Intercultural Management, London, Kogan Page • Varner, I. / Beamer, L. (2010): Intercultural Communication in the Global Workplace, New York, McGraw-Hill
11	**Contribution to the Program** Students will acquire an understanding in employee behavior, cost-oriented decisions, and the behavioral and cultural effects associated with controlling methods.
12	**Last Update** 05.02.2018

Module 0926 Scientific Project

1	**Module no.** 0926	**Major** TAB	**Semester** 7	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 300	**ECTS Credits** 10
2	**Courses**		**Course Style**		**Language**	**Frequency (SWS) (hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Scientific Project		Project		German or English	x **20**	**280**	**10**

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☐	☐	☐
	Apply	☐	☒	☒
	Analyze and Evaluate	☒	☐	☐
	Develop and Expand	☒	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Apply (skills)
- Resolve scientific and technical issues, taking into account economic, environmental, safety and ethical aspects
- Develop a scientific foundation to work on a project
- Plan time, effort, and resources
- Independently learn new technologies and methods
- Document results in a clear and understandable way
- Independently research, and if needed, interview with experts.

Analyze and evaluate (Competences)
- Assess and evaluate their processes
- Assess and evaluate their results

Develop and Expand (Competences)
- Use learned methodologies to propse and implement solutions

5 **Content**
Having learned fundamental scientific principles, students will independently develop (may work in teams, if individual achievement can be proven) a project within a deadline. This will require research, and if needed, discussions with experts
This will include:
- Development, concretization and agreement of the project with the supervisor
- Creation of a schedule
- Research and discussions with experts
- Execution of tasks according to the schedule
- Presentation of the project to the supervisor, and possibly a plenary session.

6 **Participation Requirements**
According to study and examination regulations:
Completed all examss in the first stage of study

Recommended:
Completion of all exams from Semesters 1-6

7 **Forms of Assessment**
The project will be graded

8 **Module Application**
Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).

9 **Lecturer / Responsible for the Module**
Dean of Studies

Module 0926 Scientific Project

10	**Literature** • Kornmeier, M. (2008): Wissenschaftlich schreiben leicht gemacht für Bachelor, Master und Dissertationen, 6. Auflage, Bern 2013 • Joachim Stary, Die Technik wissenschaftlichen Arbeitens. Eine praktische Anleitung, Band724 von Uni-Taschenbücher, 2013 • Andermann, Drees, Duden – Wie verfasst man wissenschaftliche Arbeiten? Ein Leitfaden für das Studium und die Promotion; 3. Auflage, 2006 • Carlike, P./ Christensen, C.(2005): The cycles of Theory Building in Management Research, Working Paper, Boston 2005 • Bortz, J. Döring, N (2001). Forschungsmethoden und Evaluation, Springer Verlag
11	**Contribution to the Program** Students will acquire interdisciplinary knowledge necessary to carry out a scientific project. They will learn to structure their work in a presentable manner, and organize themselves in a manner in which they can critically question and evaluate the quality of their work.
12	**Last Update** 05.02.2018

Module 0925 Bachelor Thesis: Bachelor of Administration

1	**Module no.** 0925	**Major** TAB	**Semester** 7	**Offering** ☒WS ☒SS	**Duration** 1 Semester	**Module Type** Obligatory	**Workload (hr.)** 420	**ECTS Credits** 14

2	**Courses**	**Course Style**	**Language**	**Frequency (SWS)**	**(hr.)**	**Self Study (hr.)**	**ECTS Credits**
	a) Bachelor Thesis	Thesis	German or English	x	40	320	12
	b) Colloquium	Colloquium	German or English	x	0	60	2

3	**Qualification Target Matrix**	Professional Competence	Methodological Competence	Self and Social Competence
	Remember and Understand	☐	☐	☐
	Apply	☐	☒	☒
	Analyze and Evaluate	☐	☒	☒
	Develop and Expand	☒	☒	☐

4 **Learning Outcomes and Competences**
After completing the module, students will:

Remember and Understand (Knowledge)
- Understand the processes involved in scientific research

Apply (Skills)
- Independently complete a task of international business administration (TBB) and technical business administration / automotive industry (TAB) on a scientific basis within a set deadline.
- Select the appropriate methods for the treatment of their topic, and justify and document it on a theory-guided basis.
- Present a scientific thesis and defend it against a plenum
- Organize their work and themselves in a presentable manner
- Systematically and scientifically structure their topic

Analyze and Evaluate (Competences)
- Analyze and evaluate scientific and technical tasks and their solutions
- Evaluate their topic via a scientific discourse and assign its relevance to mechatronics.
- Analyze essential research and present their findings in a relatable way

Develop and Expand (Competences)
- Implement scientific and technical tasks, taking into account economic, environmental, safety and ethical aspects
- Develop existing skills to solve new problems.

5 **Content**
In the thesis, students will independently develop (also in the team that if the equity performance can be demonstrated) a thesis within a deadline. They will apply scientific methods and present their results. This will include:
- Development and concretization of the task
- Creation of a work and schedule
- Literature review
- Planning, implementation and evaluation of the task
- Theoretical derivation and justification of general problem solution designs or specific policies
- Selective and logical structure of the representation
- Formulation of the text and, where possible, create appropriate visualizations (charts, tables)
- Final review of work on recognizable consistency and linguistic correctness

The Colloquium consists of a presentation, in which students present their thesis in the form of lecture and defend against a plenum

6 **Participation Requirements**

Module 0925 Bachelor Thesis: Bachelor of Administration

	According to study and examination regulations: Completed Practical Study Semester Recommended: Completion of all exams from Semesters 1-6
7	**Forms of Assessment** The Bachelor thesis and Colloquium will be evaluate by two examiners. Module performance will be the mean score given by the examiners.
8	**Module Application** Obligatory module in the Bachelor's Program for International Business Administration (TBB) and Technical Business Administration / Automotive Industry (TAB).
9	**Lecturer / Responsible for the Module** Dean of Studies
10	**Literature** • Kornmeier, M. (2008): Wissenschaftlich schreiben leicht gemacht für Bachelor, Master und Dissertationen, 6. Auflage, Bern 2013 • Joachim Stary, Die Technik wissenschaftlichen Arbeitens. Eine praktische Anleitung, Band724 von Uni-Taschenbücher, 2013 • Andermann, Drees, Duden – Wie verfasst man wissenschaftliche Arbeiten? Ein Leitfaden für das Studium und die Promotion; 3. Auflage, 2006 • Carlike, P./ Christensen, C.(2005): The cycles of Theory Building in Management Research, Working Paper, Boston 2005 • Bortz, J. Döring, N (2001). Forschungsmethoden und Evaluation, Springer Verlag
11	**Contribution to the Program** Students will acquire interdisciplinary knowledge necessary to carry out a scientific project. They will learn to structure their work in a presentable manner, and organize themselves in a manner in which they can critically question and evaluate the quality of their work.
12	**Last Update** 05.02.2018