Technische Hochschule
Brandenburg
University of
Applied Sciences

Module descriptors for English-taught modules and modules with English support at

Brandenburg University of Applied Sciences

Winter Semester (Sep-Feb)

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University of Applied Sciences

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Although we check all offers carefully and update them regularly changes might still occur due to short-term modifications. Version: 12.04.2024

Contents

Department of Business and Management: Bachelor modules

Brief module label:	Projektmanagement
Module description:	Project Management and Social Competences
German name	Projektmanagement und soziale Kompetenzen
Division in teaching sessions, if applicable:	Module, lecture, exercise
Duration of module:	One semester
Classification in the curriculum:	WI BA, 3rd semester, required module
Usability of the module:	Preparatory course for subsequent advanced courses
Frequency of offering of modules:	Every academic year
Author:	Prof. Dr. Andreas Johannsen
Private lecturer:	Prof. Dr. Andreas Johannsen
Language of instruction:	German, for exchange students English
Prerequisites:	None
ECTS-Credits:	5
Total workload and its composition:	150 hours = 60 hours of attendance and 90 hours of self-study
Form of teaching/semester hours per week:	Lecture: 2 semester hours per week Exercise: 2 semester hours per week Total: 4 semester hours per week
Study and examination achievements:	Assessment Centre Report (10%), home assignment with presentation (40%), written examination (50%)
Weighting of the grade in the overall grade:	1/3 of the subject grade; 7% of all subject grades; 2.33% of the final grade
Learning outcomes:	Lecture: The students recognize and discuss about the social competences in the context of Project Management. They identify particular social phenomena and problems in projects. They know the main features and methods required for a professional Project Management. They recognize their own resources. They can outline the requirement of professional cooperation and identify the development of their personal potential. Exercise: The students are able to apply the broad-based methods of Project Management, utilize the possibilities of successful communication (discuss, explain, elaborate, negotiate etc.) in project situations, they apply different forms of teamwork for preparing and presenting the results of group work, they prepare themselves for forthcoming assessment procedures, apply methods of time management and work organization.
Contents:	Management of software projects: 1. Basics of Project Management 2. Specific management of software projects

	3. Instruments: Data collection techniques, methods of estimation of effort, creative techniques, Specifications, handling project risks, planning techniques (phase planning, network planning technique) 4. Quality management (fundamentals, product quality, process quality, methods, quality policy, testing programs, test objects and aims in various project phases) Basics of social competences: 5. Sociological/psychological principles habitus, self-perception/perception of others, individual perception, Iceberg model, requirements, values etc. 6. Basics of communication TZI, TA – Analysis, 4-page model, art of negotiation 7. Cooperation in enterprises, team development What is a team?, Structures, problems, selection and deployment of teams etc. 8. Team training Group dynamism, Role behaviour, successful team behaviour 9. Personal appearance Appearance appropriate to situation (behaviour, dress, body language, rhetoric..), 10. Personnel development Requirement profiles, Assessment – Centre, multimodal personnel selection 11. Job application training (Part I) CV analyses, testimonials 12. Job application training (Part II) E-Mail/Online- and multimedia – Job applications, Job interviews 13. Social competences in virtual space Online communication compared to direct communication, comparative analyses 14. Learning and working techniques (Part I) Learning techniques, time management 15. Learning and working techniques (Part II) Work organization, stress management
Teaching and learning methods:	Lecture using a combination of media (transparencies, blackboard work, demos), accompanying exercises with Assessment Centre (Video recordings and evaluations in the group), home assignment and group work, presentations.
Literature:	Balzert, H.: Software-Technologie [Software Technology], Vol. 2, Berlin et al., 2001. Boehm, B.W.: A spiral model of software development and enhancement. In: Computer, S. 61-72, May 1988. Balzert, H.: Software-Technologie [Software Technology], Vol. 2, Berlin et al., 2001. Mellis, W.: Projektmanagement der SW-Entwicklung [Project Management in SW Development]. A comprehensive introduction (Broschiert), Vieweg 2004. Arnold, Rolf; Krämer-Stürzl, Antje: Berufs- und Arbeitspädagogik [Professional and Work Pedagogy], Berlin, 1999. Bohn, Cornelia: Habitus und Kontext [Habitus and Context], Opladen, 1991. Buzan, Tony: Kopftraining [Head training], London, 1989.

	Ebeling, Peter: Rhetorik – der Weg zum Erfolg [Rhetoric – the Way to Success], Munich, 1995 Fröhlich, Werner: Personalführung [Personnel Management], Munich, 1990. Hufnagel, Heidrun: Multimodale Personalauswahl [Multimodal Personnel Selection], Würzburg, 2002. Kress, Nadina-Maria; von Studnitz, Andreas: Teamführung: Gemeinsam zum Ziel [Team Management: Achieving the Aim Jointly], Hamburg, 2000. Molcho, Samy: Körpersprache [Body language], Munich, 1983. Seifert, Josef W.: Visualisieren, Präsentieren, Moderieren [Visualize, Present, Moderate], Offenbach, 2001. Schulz von Thun, Friedemann: Miteinander Reden [Talking to Eachother], Part 1 – 3.
Additional information:	Assessment-Center (Video analysis), case studies from enterprises, possibility of acquiring the certificate „Certified Professional in Project Management" issued by ASQF/ISQI following voluntary participation in additional one-week block programme.

Module description:	Innovation, Market Power and State Action
German name.	Innovationen, Marktmacht und Staatshandeln
Division into teaching sessions, if applicable:	//
Duration of module:	One semester
Classification in the curriculum:	BWL BA, 5th semester, required module
Usability of the module:	The module can also be used in other (bachelor's degree) courses in accordance with the study and examination regulations applicable there.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. rer. pol. Bettina Burger-Menzel
Lecturer:	Prof. Dr. rer. pol. Bettina Burger-Menzel
Language of instruction:	German or English
Prerequisites:	Basic understanding of economics
ECTS credits:	5
Total workload and composition of course:	150 hours = 50 hours of attendance, 40 hours of preparation and follow-up, 60 hours of preparation for examination
Form of teaching/semester hours per week:	Lecture/2 semester hours per week and project/2 semester hours per week
Study and examination requirements:	Written examination or seminar paper with presentation
Weighting of the grade in the overall grade:	According to the study and examination regulations

Learning outcomes:	Upon successful completion of this module, students will be able to understand and critically evaluate the relationship between innovative behaviour, competitive contextual factors and government intervention mechanisms. In detail: Students will be able to identify the link between innovation, diffusion and economic growth and to describe them as reference frameworks by using the example of a basic technological innovation (e.g. computer technology). They will acquire a technical and methodological understanding of market and competition theory and be able to delineate relevant markets and reflect on their structural factors based on market behaviour and results. They will be able to classify the instruments of competition policy (merger and abuse control) in the context of a free-market constitution and discuss them on a case-by-case basis. They will understand the motivation of technology policy (national innovation systems), be able to assign their various instruments to the categories of order and discretionary politics, and develop an awareness of possible conflicts of interest between competition and technology policy. They will be able to name possible challenges to the effectiveness of state action and discuss it critically as a field of tension between "market versus state failure".
Contents:	In "Innovation, Market behaviour and State action" module, the fundamentals of market and competition theory are taught in order to critically grasp the basic patterns of explanations about competition processes, to understand the functioning of various markets and to identify the intentions in the practices of competition policy against the background of a growing knowledge-based society and an environment that is characterized by technical advancement, technological fusion and globalisation. The approach is divided into the following aspects: • Market and competition theory (20%) • Structures, behaviour and results in the relevant market (30%) • Competition policy related interventions in the relevant market (50%)
Teaching and learning methods:	The most important learning and knowledge contents are prepared by the students as much as possible and under the structuring guidance of the lecturer through self-study, consolidated through discussions, and further developed and substantiated through overlapping questions. During this process, interactive and seminar-type teaching methods are utilised as much as possible. Based on the acquired knowledge or current events, the students are expected to work on individual topics and present the outcome in a plenary session.

	During the teaching sessions, to supplement them, reference literature is recommended or files and texts available on the Web are collected as working material, and multimedia applications are expressly preferred. Through the Moodle learning platform, the students have the possibility to obtain (also updated) material at any time or place and to work with them in workgroups or jointly together.
Literature:	Current editions of basic economics literature, e.g. Antonelli, G.: Economics of structural and technological change: Industrial economic strategies for Europe, Routledge 1997 Case, J.: Competition, New York 2007 Freeman, C.; Soete, L.: The Economics of Industrial Innovation, Cornwall 2004 Götting, H.-P.: Gewerblicher Rechtsschutz und Urheberrecht [Commercial Legal Protection and Copyright], Munich 2005 Hotz-Hart, B., et al.: Innovationen: Wirtschaft und Politik im globalen Wettbewerb [Innovations: Economy and Politics in the Global Competition], Bern 2001 Kling, M.; Thomas, S.: Grundkurs Wettbewerbs- und Kartellrecht [Basic Course in Competition and Cartel Law], Munich 2004 Knottenbauer, K.: Theorien des sektoralen Strukturwandels [Theories of Sectoral Structural Changes], Marburg 2000 Kurzlechner, W.: Fusionen, Kartelle, Skandale – Das Bundeskartellamt als Wettbewerbshüter und Verbraucheranwalt [Fusions, Cartels, Scandals – The Federal Cartel Office as the Protector and Consumer Advocate of Competition], Munich 2008 Lettl, T.: Das neue UWG [The New Law Against Unfair Competition], Munich 2004 Maggioni, M. A.: Clustering Dynamics and the Location of High-tech Firms, Heidelberg 2002 Meißner, W.; Fassing, W.: Wirtschaftsstruktur und Strukturpolitik [Economic Structure and Structural Policy], Munich 1989 Morasch, K.: Industrie- und Wettbewerbspolitik [Industry and Competition Policy], Munich 2003 Motta, M.: Competition Policy – Theory and Practice, Cambridge University Press, New York 2004 Olson, M.: The Logic of Collective Action, Cambridge, Massachusetts 1971

	Richter, R.; Furubotn, E.G.: Neue Institutionenökonomik [New Institutional Economics], Tübingen 2003 Rogers, E.M.: Diffusion of Innovations, London 2003 Schmidt, I.: Wettbewerbspolitik und Kartellrecht [Competition Policy and Cartel Law], Stuttgart 2001 Schmidt, I.; Schmidt, A.: Europäische Wettbewerbspolitik und Beihilfekontrolle [European Competition Policy and State Aid Control], Munich 2006 Schulz, N. (2003): Wettbewerbspolitik [Competition Policy], Tübingen 2003 Scotchmer, S.: Innovation and Incentives, Cambridge, Massachusetts 2004 Williamson, O.E.: The Economic Institutions of Capitalism, London 1985
Additional information:	//

Course name:	System Analysis
German name:	Systemanalytische Kompetenzen
If applicable, division into teaching formats:	Module, lectures, complimentary Exercises
Duration of the course:	One Semester
Part of Curriculum:	WI Ba, 1. Semester, mandatory course
Applicability of the course:	Serves as preparation for subsequent courses, in particular with regard to process modeling and software development.
Frequency of the course:	Every academic year
Responsible for course:	Prof. Dr. Olga Levina
Lecturer:	Prof. Dr. Olga Levina
Language of instruction:	German, English
Prerequisites:	None
ECTS-Credits:	5
Total workload and its composition:	150 h = 50 h lectures with complimentary exercises, 50 h preparation and review, computer-based independent reinforced learning, 50 h preparation for exam
Teaching format/Semester hours per week (SHW):	4 SWS = 2 SHW lectures + 2 SHW complimentary exercises

Course work/form of examination:	Practical exams, interim assessments, case study
Weighting of the course grade in the overall grade:	In accordance with study and exam regulations
Learning Outcomes:	**After successful completion of this module, students will be equipped to** accompany the planning, implementation, and ongoing operation of IT technologies in companies, taking into account societal norms and rules from an economic perspective. Methods of analytical and systemic thinking are employed to identify, analyze, and determine potential improvements in processes and requirements within the company context. Aspects of communication, value creation, operational processes, and tools are examined within the framework of the business system, with potentials for enhancing synergy identified. The role of operational IT in achieving corporate objectives is elucidated. You will gain an overview of methods for capturing, analyzing, and improving operational structures, as well as for documenting and prioritizing requirements for supporting IT tools.
Content:	**Lectures (ca. 50%)** • Structuring and Planning (IT) Projects • Economic Decision Criteria for Hardware and Software Selection: Cost-Benefit Analysis • Approaches to Selecting Enterprise Software • System Analysis Models in Business Informatics • Gathering and Formulating IT System Requirements • Approaches to Analyzing and Improving Business Processes • Identifying Security Potentials in Business Operations • Approaches to Realizing Identified Potentials in Business Operations **Exercises (ca. 50%)** • Project Planning for Conducting System Analysis in the Company • Representation of Simple Business Processes in Enterprise-wide IT Solutions (Data Modeling: ERD in Chen Notation; Process Modeling with BPMN) • Requirement Modeling: UML Use Case Models, Mockup Creation • Identification and Prioritization of Stakeholders and Their Requirements Using STEP • Identification of Potential Attack Scenarios on Business Operations (Mis-use Case Diagrams)

Teaching and learning methods:	Lectures, group exercises, case studies
Literature:	Krallmann, H.; Bobrik, A.; Levina, O.: Systemanalyse im Unternehmen, 6. Aufl., Oldenbourg Verlag, München, 2012 Laudon, K.C., Laudon, J.P. Management Information Systems. Pearson, 2021 (in English) Laudon, K.C., Laudon, J.P., Schroder, D. Wirtschaftsinformatik. Eine Einführung. 2015 (in German)
Notable:	Computer-based practical exercises, working with case studies, (if possible) guest lectures for insights on industry practices

Module description:	Configuration and implementation of business processes in Enterprise Resource Planning (ERP) systems
German name	Integration von Finanz-und Auftragsprozessen in ERP-Systemen
Division into teaching sessions, if applicable:	//
Duration of module:	One semester
Classification in the curriculum:	WI BA, 4th semester, elective module
Usability of the module:	The module can also be used in other (bachelor's degree) courses according to the study and examination regulations applicable there.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. Andreas Johannsen
Private lecturer:	Prof. Dr. Andreas Johannsen
Language of instruction:	German or English
Prerequisites:	The knowledge of the module "Basics of ERP systems". are necessary.
ECTS credits:	5
Total workload and composition of course:	150 hours = approx. 50 contact hrs, 100 hrs directed self-study
Form of teaching/semester hours per week:	Lecture: 2 hrs weekly per semester Exercise: 2 hrs weekly per semester
Study and examination requirements:	Oral or written exam
Weighting of the grade in the overall grade:	According to the study and examination regulations
Learning outcomes:	The students are able to analyze and evaluate business processes. Upon completion of the module the students will be able, with the help of special knowledge of ERP systems in central (e.g. logistics, finance, human resources) to realize the implementation of processes. Through case studies, students will develop a distinctive problem-solving and assessment competence.
Contents:	Students analyze and model business processes for a company and then configure an ERP system in such a way that the processes are implemented in a runnable manner. In the process, the students work in groups of different functional areas of a company such as human resources, financial

	accounting, production and sales are worked on in sub-projects in order to convey the complexity of ERP implementations. Concrete contents: Organization and management of ERP projects, process reengineering, organizational elements in the various functional areas of an ERP system System-technical: mandates, users, authorization objects Finance and accounting: Company codes, cost centers, charts of accounts, credit control areas Logistics: plants, sales organizations, sales areas, distribution channels, storage locations, divisions Human resources: Organizational units, positions Information systems: creation of analyses and reports
Teaching Methods:	Lecture with mixed media (beamer and slides), Exercise in the PC lecture hall in small groups (up to 15 people), project work
Literature:	Magal S., Word J.: Integrated Business Processes with ERP Systems (Wiley, 2011) Ritter B.: Enterprise Resource Planning (Mitp-Verlag, 2005) Monk E., Wagner B.: Concepts in Enterprise Resource Planning (Thomson, 2006) Shields M.: ERP-Systeme und E-Business schnell und erfolgreich einführen (Wiley-VCH, 2002)

Department of Business and Management: Master modules

Brief module label:	Intern. B2B-Marketing
Module description:	International Marketing (Business-to-Business-Marketing)
Division in teaching sessions, if applicable:	
Duration of module:	One semester
Classification in the curriculum:	BWL MA, 2nd semester, required module
Usability of the module:	The module can also be employed in other (Master's) courses according to the regulations of studies and examinations applicable there.
Frequency of offering of modules:	Every academic year
Author:	Prof. Dr. Uwe Höft
Lecturer:	Prof. Dr. Samuel Kristal
Language of instruction:	English
Prerequisites:	Previous knowledge of the module "International Management and Marketing"
ECTS-Credits:	6
Total workload and its composition:	150 hours of workload: approx. 50 contact hours, approx. 40 hours of preparation and follow-up, 7.5 working days = 60 hours of preparation for examination
Form of teaching/semester hours per week:	Lecture and business game seminar "Sell the robot" (total 4 semester hours per week)
Study and examination achievements:	Normally written examination of 90 min. duration (or alternatively any form of examinations prescribed in the regulations of studies and examinations)
Weighting of the grade in the overall grade:	According to the regulations of studies and examinations or 0.7*(5/90) = 3.89%
Learning outcomes:	The students are expected to familiarize themselves with the outline of fundamentals, theories and instruments of the B-to-B Marketing and apply them. Basic understanding of industrial and international markets and the relevant marketing instruments is a prerequisite for successful international market processing.
Contents:	Fundamentals and basic terminology of Business-to-Business Marketing The buying pattern of organisations (analysis of industrial demand pattern) Operative B-to-B Marketing (Marketing-Mix Instruments of international B-to-B Marketing) Product policy Services policy Price and conditions policy Distribution policy/Distribution management Communications policy Management game seminar (compact seminar) "Sell the robot"

Teaching and learning methods:	Lecture and seminar teaching; management game seminar (compact seminar);
Literature:	Backhaus, Klaus: Industriegütermarketing [Industrial Goods Marketing], 7th ed. 2003 Backhaus, Klaus / Voeth, Markus: Industriegütermarketing [Industrial Goods Marketing], 9th ed. 2010 Godefroid, Peter / Pförtsch, Waldemar: Business-to-Business-Marketing, 4th ed. 2008 Baaken, Thomas et al. (Publ.): Business-to-Business-Kommunikation [B2B Kommunication], 2nd ed. 2012 Hutt, Michael D./Speh., Thomas W.: Business Marketing Management: B2B, 10th ed. 2010
Additional information:	Supplementing the course, there are an extensive script and as further learning aid a question catalogue; business game "Sell the robot".

Brief module label:	Business Management (BWL) Project for Erasmus and exchange students
Module description:	Business Management (BWL) Project
Division in teaching sessions, if applicable:	Project
Duration of module:	One semester
Classification in the curriculum:	All semesters, BWL MA and BA (ERASMUS and exchange students, only)
Usability of the module:	The module can also be employed in other (Master's) courses according to the regulations of studies and examinations applicable there.
Frequency of offering of modules:	Every academic year
Author:	Prof. Dr. Katharina Frosch
Private lecturer:	Any of the professors involved in this course may teach in this module.
Language of instruction:	English
Prerequisites:	//
ECTS-Credits:	10
Total workload and its composition:	300 hours of self-study, attendance components will be determined together with the tutor individually, however, not more than 100 hours.
Form of teaching/semester hours per week:	Self-study and accompanied project work
Study and examination achievements:	Project work and home writing assignment
Weighting of the grade in the overall grade:	
Learning outcomes:	The students are able to independently analyse and evaluate the theoretical fundamentals of selected topics. The aim of the project is to apply the business management related

	instruments and to compile the findings into a paper and, if applicable, present the results (e.g. to German students in a regular study module). Minimum standards: • written project results of 20-30 pages (including own tables and graphs); upper/lower/left/right page margins all set on 3 cm, body text in Arial 12 pt. • compliance with the general rules of good scientific practice (in particular: substantiating arguments with well-established evidence; using detailed citations to indicating all external sources; list of references) • at least one personal meeting with the tutor, not later than 8 weeks after the semester has started
Contents:	Possible tasks and topics are derived, for example, from the selected areas of specialization relating to: • Topics related to International Management and international Marketing as well as customer relationship management (Prof. Schwill) • Innovation research and technology studies as well as supply/value chain management (Prof. Mieke) • Logistics and process analysis (currently not available) • Market Research; Industrial Marketing; Innovation Management and Innovation Intelligence (Prof. Schwill or Prof. Kristal, Prof. Kristal not in 2024) • Studies, projects and analyses related to the management of small and medium-sized enterprises SME (Prof. Schnurrenberger) • Projects on strategic and practical aspects of accounting, controlling and business succession (currently not available) • Entrepreneurship and start-up marketing (Prof. Wrobel) • Projects and analyses on technology and competition policy with a strong focus on international aspects as well as social innovation (Prof. Burger-Menzel) • Reports and analyses linked to legal aspects of business and management (Prof. Blasek) • Projects and analysis in the field of Corporate Finance (currently not available) Projects and analysis in the field of Corporate Governance and Sustainability (Prof. Kühne) • Empirical projects on business-related or economics-related questions, as well as projects on economic theory. These projects aim to explore and analyze various aspects, such as market behavior, economic policies, and the impact of economic factors on decision-making (Prof. Tarassow) Applications of Data Science and Machine Learning (Prof. Guterding) Projects can adopt a mainly application-oriented as well as a research-oriented perspective.
Teaching and learning methods:	Project work, independent preparation of a writing assignment; presentation
Literature:	Bailey, S. (2011): Academic writing, London, Routledge. Bryman, A., & Bell, E. (2015): Business research methods, Oxford, Oxford Univ. Press. Johnson, R., Wichern, D. (2007): Applied Multivariate Statistical Analysis, 6/E, Harlow, Pearson.

	Saunders, M., Lewis, P., Thornhill, A. (2015): Research Methods for Business Students, 7/E, Pearson. Additional reference works for the relevant assignment may be indicated by the respective tutor. Including reference works for processing the relevant assignment.
Additional information:	Only exchange students can chose this course. Please contact the international office (wolffh@th-brandenburg.de) to check in which fields there are places available (max. 2 students/semester per tutor). Determining the topic early (first two weeks of your exchange semester) and starting the work on the project immediately after the topic is set is explicitly recommended.

Brief module label:	Modelling Processes
Module description:	Modelling and Analysis of Processes
German name	Modellierung und Analyse von Prozessen
Division in teaching sessions, if applicable:	Lecture, exercise
Duration of module:	One semester
Classification in the curriculum:	WI Ma, 1st semester, required module
Usability of the module:	The module is a preparatory step for other related courses.
Frequency of offering of modules:	Every academic year
Author:	Prof. Dr. Dietmar Wikarski
Private lecturer:	Prof. Dr. Dietmar Wikarski
Language of instruction:	English
Prerequisites:	Bachelor's course modules; System analysis and Process modelling
ECTS-Credits:	6
Total workload and its composition:	180 hours = 72 hours of attendance and 108 hours of self-study
Form of teaching/semester hours per week:	Lecture: 2 semester hours per week Exercise: 2 semester hours per week
Study and examination achievements:	Written examination or homework or presentation
Weighting of the grade in the overall grade:	1/3 of the subject grade; 14% of all subject grades; 4.66% of the final grade
Learning outcomes:	Based on the basic skills acquired earlier in the Bachelor's course for the analysis and modelling of processes, they are updated, consolidated and extended to complex models and procedures, including discussion on the methods. As a generalized abstraction for modelling business and

	cooperation processes, the students acquire abilities in conceptualizing multi-dimensional, spatially discrete and temporally constant process structures and in using relevant software tools.
Contents:	• Basic description methods for spatially discrete and auxiliary processes (finite automations, Petri nets, Markov chains) • Object-oriented methods for process modelling • Current modelling languages for business and cooperation processes (eEPK, BPML, BPEL, etc.) • Overview of standards and software tools for modelling • Analysis and evaluation of business processes (WfMC-Reference model, Adonis, ARIS, SemTalk etc.) • Consolidated exemplary application of at least one of these tools • Optional: Elements of Operations Research (Optimization, Queuing theory,…)
Teaching and learning methods:	Lecture, self-study, practical modelling exercises on the PC
Literature:	F. Bause, P.S. Kritzinger: Stochastic Petri Nets, Vieweg-Verlag H. Krallmann et al.: Systemanalyse im Unternehmen [System Analysis in Companies], Oldenbourg-Verlag Bernd Oestereich et al.: Objektorientierte Geschäftsprozess-modellierung mit der UML [Object-oriented Business Process Modelling with the UML], dpunkt-Verlag W. Reisig: Einführung in Petrinetze [Introduction to Petri nets], Springer-Verlag C. Richter-Von Hagen, Wolffried Stucky: Business-Process and Workflow Management: Prozessverbesserung durch Prozess-Management [Process Improvement through Process Management], B.G. Teubner-Verlag J. Staud: Geschäftsprozessanalyse [Business Process Analysis], Springer-Verlag G. Vossen, J. Becker (Publ.): Geschäftsprozessmodellierung und Workflow-Management [Business Process Modelling and Workflow Management], Intl. Thomsen Publishing

Brief module label	Ethical and legal issues of digital transformation
Module Name:	Ethical and legal issues of digital transformation
	Ethische und rechtliche Fragen der digitalen Transformation
Duration of module:	One semester
Classification in the curriculum:	WI MA, 2nd semester
Lecturer.	Prof. Levina
Language of instruction:	English
ECTS-Credits:	6
Requirements.	English language (Reading and writing) Digital Technologies, Data Management, Basic understanding of software development Systems Thinking
Teaching Methods:	Interactive lectures Discussions, code audits Text Analysis Data collection and analysis

Assessment:	Report on specific topics (Empirical) Analysis of specific topics Continuous reflexion (short written pieces) Final term paper
Learning Outcomes:	Understanding the role of digital technologies in shaping of social interactions and individual behavior Understanding the role of values within software development
Content:	Overview of European legislation relevant for data processing/analysis and MLS Data, algorithms, law and labour Why ethics in Information systems design? The ethos of making

Name:	**Value-oriented IT management**
German Name	Wertorientiertes IT-Management
Duration of module:	One semester
Classification in the curriculum:	WI Ma, 1st semester, core module
Usability of the module:	The module lays the foundations in the areas of use and quality-oriented IT management for the subsequent learning areas of core and elective modules.
Frequency offered:	Every academic year
Module leader:	Prof. Dr.-Ing. André Nitze
Lecturer:	Prof. Dr.-Ing. André Nitze
Language of instruction:	German / English
Prerequisites:	Lectures on Principles of business informatics Principles of business studies Information management
ECTS credits:	6
Total workload and composition of course:	180 hrs. = 72 hrs. attendance and 108 hrs. self-study
Form of teaching/semester hours per week:	4 contact hours = 2 hours lecture + 2 hours workshop
Study and examination requirements:	Written examination and project work with presentation
Weighting of the grade in the overall grade:	According to SER
Learning outcomes:	Upon successful completion of this module, the students will possess knowledge in IT management. The students are taught knowledge on the following topics, in Part A: Principles of integrated information management, IT sales management, IT production management, IT procurement management and IT back-office functions; in part B: IT service management fundamentals, IT service strategy and continual service improvement, IT service design, IT service transition and IT

	service operation. Assess the fundamentals of modern information management, which illuminates newer approaches beyond textbook literature. In particular, getting to know new paradigms in information management as well as the critical assessment of practical relevance and operational capability. Both methodological aspects as well as current questions from corporate practice concerning the organization of the IT, essential tasks of information management and their execution form key technical learning objectives in of the module. The focus is on leadership, management and organisation of all IT-related topics in companies. The students will develop pronounced problem-solving and assessment competence. The students will master the theoretical principles in order to implement them cognitively, intuitively and creatively in their work.
Contents:	Part A: Part I: Principles of integrated information management Part II: IT sales management Product management Account management Part III: IT production management Product engineering, production engineering Management of service provision Delivery management Part IV: IT procurement management Sourcing management Part V: IT back-office functions IT controlling IT quality management Part B: IT service management fundamentals IT service strategy and continual service improvement IT service design IT service transition IT service operation
Teaching and learning methods:	Lectures Exercises in the form of case studies with homework Independent development of topics by the students with subsequent presentation and joint discussion
Literature:	Integr. Information management Zarnekow R., Brenner W., Pilgram U. (2005): Integriertes Informationsmanagement Springer-Verlag, Berlin Zarnekow R. (2007): Produktionsmanagement von IT-Dienstleistungen, Springer-Verlag, Berlin ITIL Ebel, Nadine (2008): ITIL V3 Basis Zertifizierung, Addison-Wesley Rüdiger Zarnekow, Axel Hochstein, Walter Brenner (2005): Serviceorientiertes IT-Management. ITIL-Best-Practices und –Fallstudien, Springer-Verlag, Berlin Rüdiger Zarnekow, Axel Hochstein, Walter Brenner (2005): Serviceorientiertes IT-Management. ITIL-Best-Practices und –Fallstudien, Springer-Verlag, Berlin

	OGC Books ITIL (2011): Continual Service Improvement; TSO, 2011. OGC Books ITIL (2011): Service Design; TSO, London, 2011. OGC Books ITIL (2011): Service Operation; TSO, London, 2011. OGC Books ITIL (2011): Service Strategy; TSO, London, 2011. OGC Books ITIL (2011): Service Transition; TSO, London, 2007.
Additional information:	Offer of ITIL certification to build upon lecture.

Name:	Innovation Intelligence/Innovation Market Research
German Name	//
Duration of module:	One semester
Classification in the curriculum:	TIME MA, 2nd semester
Usability of the module:	The module can also be used as part of other master's degree programmes according to their particular study and examination regulations.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. Samuel Kristal
Lecturer:	Prof. Dr. Samuel Kristal
Language of instruction:	English
Prerequisites:	//
ECTS credits:	6
Total workload and composition of course:	180 hrs. = approx. 60 hrs. attendance; approx. 50 hrs. preparation and revision, approx. 70 hrs. examination preparation
Form of teaching/semester hours per week:	Lecture / Project / Coaching – 4 contact hours
Study and examination requirements:	Project work (written + oral part)
Weighting of the grade in the overall grade:	According to SER
Learning outcomes:	In this class, students acquire the relevant knowledge for product and marketing managers of how to obtain data and insights from markets. The students learn about methods of designing studies (qual. and quant.), collecting data and presenting results.
Contents:	- Foundations and instruments of classical market research in the context of innovations - Selected instruments of innovation market research - Qualitative Market Research methods - Quantitative Market Research methods - Structuring and writing papers at the crossroads of

	academia and practice
Teaching and learning methods:	Lecture / Project / Coaching
Literature:	- Kreis, H/ Wildner, R./ Kuss. A (2021).: Marktforschung, 7. Auflage, Springer. - Eisend, M./ Kuss, A. (2019): Research Methodology in Marketing, Springer. Selected academic journals offering current papers on Marketing and innovation, such as: - Journal of Product and Brand Management. - Journal of Brand Management. - Journal of Business Research - Journal of Product Innovation Management
Additional information:	//

Name:	Product Planning and Concept Development
German Name	Lab 2 – Produktplanung und Konzeptentwicklung
Duration of module:	One semester
Classification in the curriculum:	TIME MA, 2nd semester
Usability of the module:	The module can also be used as part of other master's degree programmes according to their particular study and examination regulations.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. Samuel Kristal
Lecturer:	Prof. Dr. Samuel Kristal
Language of instruction:	English
Prerequisites:	//
ECTS credits:	6
Total workload and composition of course:	180 hrs. = approx. 60 hrs. attendance; approx. 50 hrs. preparation and revision, approx. 70 hrs. examination preparation
Form of teaching/semester hours per week:	Project/ Coaching – 4 contact hours
Study and examination requirements:	Project work (written + oral part)
Weighting of the grade in the overall grade:	According to SER
Learning outcomes:	With the LABs, concrete TIME-relevant projects from theory and practice are to be worked on by the students in teams. In the context of Lab 2, competencies in the area of product planning and concept development are to be acquired. Based on cases, these skills are to be applied in a practical manner.

Content:	- Innovation Intelligence - Product management - Project management and project work
Teaching and learning methods:	Introductory lecture; group discussion; coaching; group and individual consultations; presentation.
Literature:	Literature will be announced during class and depends strongly on projects Selected academic journals offering current papers on Marketing and innovation, such as: - Journal of Product and Brand Management. - Journal of Brand Management. - Journal of Business Research - Journal of Product Innovation Management
Additional information:	//

Module no./code:	BM630
Name:	Economics of Strategic Behavior
Division in teaching sessions, if applicable:	//
Duration of module:	One semester
Classification in the curriculum:	BWL MA, 1st semester, elective module field C
Usability of the module:	The module can also be used in other (master's degree) courses in accordance with the study and examination regu-lations applicable there.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. Bettina Burger-Menzel
Private lecturer:	Prof. Dr. Bettina Burger-Menzel
Language of instruction:	English
Prerequisites:	None
ECTS-Credits:	6
Total workload and its composition:	180 hours = 60 hours of attendance and 120 hours of self-study
Form of teaching/semester hours per week:	4 semester hours per week
Study and examination achievements:	Either a written examination of 90 min. in duration must be passed or a project (homework assignment) followed by a presentation must be completed
Weighting of the grade in the overall grade:	According to the study and examination regulations
Learning outcomes:	After the successful completion of the module, students will be capable of transferring findings and methodological ap-proaches of decision, network and motivation theory to a context-specific case, and to use discursive skills to review and validate this. In detail:

	The students will understand the scientific derivation and meaning of the ideas of man and their connection with more quantitatively or qualitatively oriented behavioural models. They will be able to identify the essential motives for action and optimisation strategies of a (limited) rational person and reflect critically on them (Level 1). They will be able to recognise how different network roles, structures and relationships affect human behaviour and discursively represent different perspectives (Level 2). They will be aware of the interaction of motivation and cognition, and to the consequences this can have for human optimisation behaviour (Level 3). They will be capable of applying the knowledge gained in the three levels to a self-developed case, and to further develop the case with increasing complexity of context factors. They will have been taught to communicate and reflect on the individual findings of a tandem partner and within the group, and to face a critical discourse (e.g. in the context of a role play).
Contents:	The content is based on research-based and interdisciplinary discussion of the idea of man at the interface with: - Global cooperation - Sustainability strategies in an environmental context - Multi-stakeholder environment The idea of man is extended by three steps: - Homo economicus and limited rationality - Homo socialis and the intercultural references - Multiple self and cognition The resulting optimisation strategies are analysed, critically discussed and transferred to the student's own application example, even against the background of complex adaptive systems.
Teaching and learning methods:	Instruction in seminars with group exercises, student discussion forums with ownership of content and process organisation as well as an application forum guided by the lecturer.
Literature:	Ainslie, G. (1986): Beyond microeconomics. Conflict among interests in a multiple self as a determinant of value. in: Elster, J. (ed.), The multiple self, Cambridge University Press, Cambridge, 133-176 Andreasen, N.C. (2005): The creative brain, Plume Book, New York Boyer (2012): Institutions as cause for incomplete negotia-tions, in: Faure, G.O. / Cede, F. (eds.), Unfinished Business - Why international negotiations fail, University of Georgia Press, London, 220-240 Burger-Menzel, Bettina (2016): Environmental Politics and the Human Being: A New Interdisciplinary Perspective on Motivational Processes and Sustainable Change Behavior, Global Cooperation Research Papers 13, Käte Hamburger Kolleg / Centre for Global Cooperation Research (KHK/GCR21), Duisburg Clayton, A.M.H.; Radcliffe, N.J. (1996): Sustainability - A Systems Approach, Earthscan Publications Ltd., London

	Deutsch, M. (2012): A Theory of Cooperation - Competition and Beyond, in: Van Lange, P.A.M.; Kruglanski, A.W.; Higgins, E.T. (eds.), Handbook of Theories of Social Psychology, Lon-don, 275-294 Elster, J. (2010): Emotional Choice and Rational Choice, in: Goldie, P. (ed.), The Oxford Handbook of Philosophy of Emo-tion, Oxford University Press, Oxford, 263-282 Kahneman (2002): Maps of bounded rationality: A perspec-tive on intuitive judgment and choice, Prize Lecture, Prince-ton University, Princeton, December Moore, C.W. (2010): Introduction to Culture and Negotiation, in: Jossey-Bass. (ed.), Handbook of Global and Multicultural Negotiation, http://site.ebrary.com/id/10366438?ppg, 3-19 (accessed on 09.06.2014) Rogers, E.M. (2003): Diffusion of Innovations, Free Press, New York von Stein, J. (2010): International Law: Understanding Com-pliance and Enforcement, in: The International Studies Ency-clopedia, Robert A. Blackwell Publishing, Denemark, 1-16 Williamson, O.E. (1981): The Economics of Organization: The Transaction Cost Approach, in: American Journal of Sociology 87 (November), 548-577 v
Additional information:	Research and application-oriented learning

Module no./code:	BM310
Name:	Quantitative Tools – Applied Econometrics
Division in teaching sessions, if applicable:	//
Duration of module:	One semester
Classification in the curriculum:	BWL MA 1st semester, compulsory module
Usability of the module:	The module can also be used in other (Master) degree programs according to the respective study and examination regulations.
Frequency offered:	Every academic year
Module leader:	Prof. Dr. Artur Tarassow
Lecturer:	Prof. Dr. Artur Tarassow
Language of instruction:	German / English
Prerequisites:	• Successful completion of an introductory lecture in econometrics, for example, the course "Applied Econometrics". • Application-ready (basic) knowledge in mathematics (matrix algebra) and statistics, or the willingness to acquire this knowledge. • Basic willingness to acquire knowledge of the software gretl and to perform practical exercises with it.
ECTS-Credits:	6

Total workload and its composition:	180 hours = 50 hours of attendance, 130 hours of self-study
Form of teaching/semester hours per week:	4 semester hours
Study and examination achievements:	Exam or course work
Weighting of the grade in the overall grade:	According to SER
Learning outcomes:	The field of economics analyzes economic processes to determine fundamental regularities. Theories are developed to illustrate cause-and-effect relationships. Verifiability and forecasting ability are important criteria. Empirical economic research, or econometrics, combines theoretical models with statistical data. The course teaches advanced methods of empirical economic research. Fundamental methods such as the regression model and residual analysis are reviewed. In addition, models with binary variables (classification) and methods of panel-regression are covered. Furthermore, methods of cluster analysis from the field of statistics or machine learning are introduced.
Contents:	• Review of descriptive statistics and the method of least squares estimator, validation of economic models and hypotheses • Tests for violations of assumptions: Does the estimation approach fit the data? • Estimations with dummy variables: Modeling socio-economic categories • Logit and probit models • Panel estimations (pooled OLS, fixed-effects, random-effects) • Principal component analysis and introduction to the *k*-means algorithm
Teaching and learning methods:	Seminar-based instruction, working on use cases using the *gretl* software, preparing students through self-study
Specific:	Intense use of the computer

Department of Computer Science and Media: Bachelor modules

See also https://informatik.th-brandenburg.de/studium/plaene-und-termine/vorlesungsverzeichnis/ for up-to-date information!

Module Name:	Algorithms and Data Structures
German Name	Algorithmen und Datenstrukturen
Study Semester:	1st semester
Module Coordinator:	Prof. Dr. Reiner Creutzburg
Main Lecturer(s):	Prof. Dr. Reiner Creutzburg
Teaching Language:	German or English
Level within Curriculum:	B.Sc. Applied Computer Science, 1st sem., mandatory module B.Sc. Informatik, 1st sem., mandatory module B.Sc. Medizininformatik, 1st sem., mandatory module
Teaching Methods:	Lecture: 2 hours weekly per semester Exercise: 2 hours weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	
Learning Outcome / Skills:	The students know standard algorithms for typical problems from: searching, sorting, string matching, recursion, trees and graphs. They are able to assess and evaluate the performance of algorithms. The know the data structures list, array, chained list, stack, queue, tree, graph. The students learn the importance of mathematics for computer science by means of concrete applications. They learn the necessary mathematical tools in concrete problems of basic computer science and are able to apply them.
Course Content:	algorithms complexity analysis, asymptotic analysis, complexity classes data structures elementary data structures trees and graphs searching and sorting string matching recursion graph algorithms case studies
Mode of Assessment:	written exam additional assessments during the semester may be included in the final grading.
Teaching Media:	Classical lecture with mixed media (slides, internet sources, animations), exercises
Literature:	Cormen T.H., Leiserson C.E., Rivest R.L., Stein C.: Introduction to Algorithms, Third Edition., MIT Press, McGraw-Hill, 2009 Sedgewick R.: Algorithmen. (2. Aufl.), Addison Wesley 2003

	Aho, A. V., Ulman, J. D.: Data Structures and Algorithms 1983

Module Name:	Mathematics I
German name:	Mathematik I
Study Semester:	1st semester
Module Coordinator:	Prof. Dr. Duc Khiem Huynh
Main Lecturer(s):	Prof. Dr. Duc Khiem Huynh
Teaching Language:	English
Level within Curriculum:	B.Sc. Informatik, B.Sc. Applied Computer Science, B.Sc. Medizininformatik 1st semester, mandatory module
Teaching Methods:	Lecture: 2 hours weekly per semester Exercise: 2 hours weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	//
Recommended Prerequisites:	//
Learning Outcome / Skills:	The students loose their timitidy of mathematics. They learn about the importance of Mathematics for computer science. They are able to apply mathematical tools in concrete computer science applications. They are familiar with mathematical thinking (abstraction, precision, logical reasoning). They are proficient in using the language of mathematical formulae. They are able to express concepts in different representations (graphical, formulae,...) and to translate between different representations. They are familiar with abstract concepts such as equvalence classes, injective/surjective/bijective functions and mappings, inverse functions, and limits. They are able to solve the following problems: • Modelling using sets • Modelling using functions • Compute limits of sequences and geometric series They are proficient in using the rules of differentiation.
Course Content:	Sets and set operations, power set, cartesian product, binomial coefficients Relations (Equivalence relations and classes) Functions (injective, surjective, bijective functions, inverse function, trigonometric functions and their inverses) Prime numbers, divisibility and modular arithmetic (congruence relation, ISBN check sum) Computing in Zm, extended euklidean algorithm sequences, series and convergence basics of differential calculus

Mode of Assessment:	Written exam Additional assessments during the semester may be included in the final grading.
Teaching Media:	Blackboard and chalk, online course
Literature:	Hagerty R.: Diskrete Mathematik für Informatiker, Bonn: Addison-Wesley, 2004 Schubert M.: Mathematik für Informatiker. Wiesbaden: Vieweg und Teubner Verlag 2009 Socher R.: Mathematik für Informatiker. München: Hanser 2011 Teschl S. und Teschl G.: Mathematik für Informatiker, Band 1, Diskrete Mathematik und Lineare Algebra. 3. Aufl. Berlin, Heidelberg: Springer 2008

Module Name:	Mathematics III
German name:	Mathematik III
Study Semester:	3rd semester
Module Coordinator:	Prof. Dr. Duc Khiem Huynh
Main Lecturer(s):	Prof. Dr. Duc Khiem Huynh
Teaching Language:	English
Level within Curriculum:	B.Sc. Informatik, B.Sc. Applied Computer Science 3rd Semester, mandatory
Teaching Methods:	Lecture: 1 hours weekly per semester Exercise: 1 hours weekly per semester
Workload:	60 hrs = 30 contact hrs and 30 hrs directed self-study
Credit Points:	2
Prerequisites according to Study and Exam Regulations:	//
Recommended Prerequisites:	Mathematics I
Learning Outcome / Skills:	The students are familiar with the basic notions of probability theory. They are able to compute total probabilities and to apply Bayes´ formula. They are able to compute mean values, variance and standard deviation of random variables. They are familiar with the following probability distributions and know how and when to apply them: Binomial, hypergeometric, Poisson, Gauß.
Course Content:	Kolmogoroff´s axioms, Laplace experiments, stochasticv independence, conditional probability, Bayesian formula, random variables, expectation value, variance and standard deviation, probability distributions (Binomial, hypergeometric, Poisson, Gauß)
Mode of Assessment:	Written exam Additional assessments during the semester may be included in the final grading.
Teaching Media:	Blackboard and chalk

Literature:	Stingl P.: Mathematik für Fachhochschulen. Technik und Informatik, 7. Aufl. München: Hanser 2003 Papula L.: Mathematik für Ingenieure und Naturwissenschaftler, Band 3, 5. Aufl. Wiesbaden Vieweg und Teubner 2008 Teschl S., Teschl G.: Mathematik für Informatiker, Band 2, Analysis und Stochastik. 2. Aufl. Berlin, Heidelberg: Springer 2007

Module Name:	Computer Programming III
German name:	Programmierung III
Study Semester:	3rd semester
Module Coordinator:	Prof. Dr.-Ing. Angela Pohl, Prof. Dr. Harald Loose
Main Lecturer(s):	Prof. Dr.-Ing. Angela Pohl, Prof. Dr. Harald Loose
Teaching Language:	English
Level within Curriculum:	Applied Computer Science, 3rd semester
Teaching Methods:	Lecture: 2 hours weekly per semester Exercise: 2 hours weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	Successful completion of the modules Programming I and II, on whose learning outcomes this module is builds on.
Recommended Prerequisites:	Mastery of the concepts of procedural and object-oriented programming Practical programming experience in the programming language JAVA
Learning Outcome / Skills:	The students know and understand the concepts of procedural and object-oriented programming (in the scope of the C and C++ programming languages). They master the syntax of both programming languages. You are able to independently write programs in C and C++, read and modify foreign programs. You will master the techniques: project organization, editing, debugging and debugging. You can exemplary in the integrated development environment Visual Studio.
Course Content:	Algorithms and data structures in application Overview of similarities and differences of JAVA, C and C++ Concepts of procedural and object-oriented Programming in theory and practice, in particular Pointer, overloading of functions, standard parameters, exception handling an function templates and multiple inheritance, early/late binding, overloading of operators and class templates; Practical work with the integrated Visual C++ development environment
Mode of Assessment:	Written exam (120 minutes) Semester performances can be included in the evaluation.
Teaching Media:	Lecture with mixed media (mainly blackboard, beamer), exercises on the computer

Literature:	Kernighan B.W., Ritchie D.M. Programmieren in C. Carl Hanser Verlag 1990 Stroustrup B. Die C++-Programmiersprache: Aktuell zu C++11, Carl Hanser Verlag 2015 Stroustrup B. Einführung in die Programmierung mit C++, Pearson Studium, 2010 Isernhagen R.: Softwaretechnik in C und C++. Carl Hanser Verlag 2000 Kirch U., Prinz P.: C++ - Lernen und professionell anwenden (mitp Professional), mitp Verlag 2015

Modul name:	Operating Systems/Computer Networks
German name	Betriebssysteme/Rechnernetze
Study Semester:	3rd semester
Module Coordinator:	Prof. Dr.-Ing. Martin Schafföner
Main Lecturer(s):	Prof. Dr.-Ing. Martin Schafföner
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	B.Sc. Informatik, 3rd sem., mandatory module B.Sc. Applied Computer Science, 3rd sem., mandatory module B.Sc. Medizininformatik, 3rd sem., mandatory module
Teaching Methods:	Lecture: 2 hours weekly per semester Exercise: 2 hours weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Operating Systems/Webcomputing
Learning Outcome / Skills:	Students have basic knowledge of programming with operating system APIs. They are able to design adequate programs under correctness and performance constraints. Students know basic concepts and technologies of modern computer networks. They understand selected protocols in detail and can evaluate different technology alternatives. Based on application requirements, students are able to design a suitable network. They are able to correctly design and implement simple distributed applications using sockets, threads, semaphores etc.
Course Content:	Input/output, device management Persistent storage, clocks, terminals File systems: requirements, design, implementation Main memory management, especially virtual memory management and page swapping Concurrency with threads Operating system APIs for files, directories, sockets, shared memory, pipes, message queues, etc. Overview of typical problems, solution patterns and properties of network communication: error handling, flow

	control, access control, congestion control, addressing, routing and forwarding Detailed analysis of selected protocols with an emphasis on: TCP, IPv4 und IPv6, Ethernet, WiFi Fundamental design methodologies for computer networks; overview of network components like switches, routers, proxies, firewalls and wireless technologies
Mode of Assessment:	- written exam Additional assessments during the semester may be included in the final grading.
Teaching Media:	Lecture with mixed media (mostly interactively filled slides), computer lab exercises
Literature:	Glatz E.: Betriebssysteme: Grundlagen, Konzepte, Systemprogrammierung, dpunkt Verlag, 2. aktual. Aufl. 2010 A.S. Tanenbaum, H. Bos: Modern Operating Systems, Pearson, 4. Aufl. 2015 A.S. Tanenbaum. D.J. Wetherall: Computer Networks, Pearson, 5. Aufl. 2011 J.F. Kurose, K.W. Ross: Computer Networking: A Top-Down Approach, Pearson, 6. Aufl. 2013

Module Name:	Fundamentals of Cloud Computing
German name:	Grundlagen des Cloud Computing
Study Semester:	3rd semester
Module Coordinator:	Prof. Dr. Thomas Preuss
Main Lecturer(s):	Prof. Dr. Thomas Preuss
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	B.Sc. Informatik, B.Sc. Applied Computer Science, B.Sc. Medizininformatik: 3rd semester (core elective module)
Teaching Methods:	Lecture: 2 hours weekly per semester Exercise: 2 hours weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Programming 1 and 2, Operating Systems & Web computing
Learning Outcome / Skills:	Students know and understand the specifics and basic concepts of distributed and cloud based systems. They are able to estimate the strength, weaknesses, opportunities and threads using such systems. Students are able to apply technologies to implement distributed and cloud based applications. In the lab students will step by step design and implement a cloud based distributed application using appropriate technologies.
Course Content:	Motivation and problems using distributed and cloud-based systems Cloud Service Models (IaaS, PaaS, SaaS) Cloud Delivery Models (Public, private, community, hybrid) Accounting models for clouds

	Cloud-Technologies Data Center Virtualization Multi tenancy Classification of communication Failure Semantics Scalability & Replication C/S and P2P architectures Middleware Technologies (Sockets, RPC, RMI) Webservices (REST & SOAP) DCOM, .NET und JEE (Overview) Trends in cloud and distributed systems
Mode of Assessment:	Written or oral exams (Announced at the beginning of the teaching period). Additional assessments during the semester may be included in the final grading.
Teaching Media:	Lecture with mixed media (blackboard and mostly interactively slides), exercises in small groups, computer based exercises
Literature:	A. S. Tannenbaum, M. van Steen: Verteilte Systeme, Pearson, 2003. T. Erl; Z. Mahmood; R. Puttini: Cloud Computing: Concepts, Technology & Architecture, Pearson 2013. M. J. Kavis: Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, & IaaS), Wiley, 2014. J. Dunkel, A. Eberhart, S. Fischer, C. Kleiner, A. Koschel: Systemarchitekturen für verteilte Anwendungen, Hanser-Verlag, 2007. A. Homer et. al.:Cloud Design Patterns, Microsoft patterns & practices, 2014.

Module Name:	Cross Device Interaction
Study Semester:	5th semester
Module Coordinator:	Prof. Julia Schnitzer
Main Lecturer(s):	Prof. Julia Schnitzer, Prof. Dr. Martin Christof Kindsmüller
Teaching Language:	English
Level within Curriculum:	B.Sc. Informatik, 5th sem., core elective module B.Sc. Applied Computer Science, 5th sem., core elective module
Teaching Methods:	Lecture: 2 hrs weekly per semester Exercise: 2 hrs weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs directed self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Human Computer Interaction, Fundamentals of Interactive Media
Learning Outcome / Skills:	Students understand the specific properties and potentials of different input and output devices. They are able to : plan, design and realize usable, fit-for-purpose solutions for cross-device interactions. develop roadmaps for connecting physical and virtual objects and services.

	they are familiar with current forms of interaction and can design them as part of a human-machine-interface with and without using extremities. They know platform-independent frameworks and current web technologies.
Course Content:	- cross-media user experience - user journeys - media convergence - interface design - internet of things - cross platform framework - HTML5, CSS3, Javascript - Json - XML, SVG - internet of things - ubiquitous computing - brain computer interface
Mode of Assessment:	- Semester project with discussion Additional assessments during the semester may be included in the final grading.
Teaching Media:	Lecture with mixed media (mostly interactively filled slides), computer lab exercises
Literature:	Levin, M. (2014). Designing Multi-Device Experiences, O'Reilly. James Kalbach (2016). Mapping Experiences: A Guide to Creatinig Value through Journeys, Blueprints and Diagrams, O'Reilly. Lomas R. (2017). Learn to Code Now. SuperHI Blokdyk G (2019). Computer-Brain Interface: A Complete Guide. Verlag 5STAR Cooks Stickdorn M (2017) This is Service Design Doing. User Research & Customer Journey Maps to Create Successful Services. BIZ Publishing Kumar, Payvar (2020). Applications in Ubiquiitous Computng. Springer Verlag

Module Name:	Lab-Course Bachelor Project (various topics)
German name:	Projekt
Study Semester:	5th semester
Module Coordinator:	Dean of Studies at the Department of Computer Science and Media
Main Lecturer(s):	All teaching staff at the Department of Computer Science and Media
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	B.Sc. Informatik, B.Sc. Applied Computer Science 5th semester
Teaching Methods:	Project Lab
Workload:	210 hrs= 60 contact lessons and 150 hrs direct self-study
Credit Points:	7
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Compulsory subjects of the semesters 1- 4

Learning Outcome / Skills:	The students put into practice what they have learned in the above-mentioned subjects in the context of a practical project. Thereby the phases of the project management will be worked on and run through. The students know how to conduct with the customer/end user. They can work out the requirements and develop an appropriate solution model. They can critically evaluate the proposed solutions and analyze the advantages and disadvantages. You will be able to prepare a complete project documentation and take into account the aspects of software documentation.
Course Content:	Project from the profile areas Intelligent Systems, Network Computing or Digital Media Computer science - topics of current research e.g.: Building a Community Network, Autonomous systems, interactive film, multimedia applications, use of applications, use of DB software for development of DB applications, security in wireless networks
Mode of Assessment:	Documentary work with oral interview Semester performances can be included in the evaluation.
Teaching Media:	Mixed media (blackboard, digital presentation)
Literature:	Kerzner H.: Project Management: A Systems Approach to Planning, Scheduling, and Controlling, John Wiley & Sons; Auflage: 10. Auflage, 2009

Module Name:	Telemedicin
German name:	Telemedizin
Study Semester:	5th semester
Module Coordinator:	Prof. Dr. Thomas Schrader
Main Lecturer(s):	Prof. Dr. Thomas Schrader
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	B.Sc. Medical Computer Science 5th semester
Teaching Methods:	Lecture: 2 hrs weekly per semester Exercise: 2 hrs weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs direct self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Fundamentals of Medicine I-III Fundamentals of Medical Informatics Computer Assisted Medicine I
Learning Outcome / Skills:	Understanding Students will understand basic concepts of communication, information exchange of information and telemedicine applications. Analyze

	You will be able to understand the requirements within the framework of telemedical issues and projects. You are able to analyze different medical data in the context of model telemedical applications, analyze and present it. Assess You will be able to evaluate the different technological possibilities for telemedicine and apply them to various practical problem areas. You can put the effort in relation to the benefit of telemedical services. Apply Students will be able to apply various standards for the design and implementation of telemedical services. Create They are able to implement a telemedical project, develop the concept for a telemedical service and set up or, if necessary, implement the corresponding services.
Course Content:	Communication & Communication Tools Mobility Telemedical application fields Standards Telemedical services: from consultation systems to collaboration tools Health card Economic and legal framework Planning of telemedical applications
Mode of Assessment:	Written exam, semester-long performances can be included in the assessment may be included.
Teaching Media:	Lecture, exercises, project work, projector, blackboard
Literature:	Trotter F, Uhlman D. Hacking healthcare [Internet]. Sebastopol, CA: O'Reilly Media; 2013 Information Resources Management Association, Herausgeber. E-Health and telemedicine: concepts, methodologies, tools, and applications. Hershey, PA: Medical Information Science Reference, an imprint of IGI Global; 2016. Cruz-Cunha MM, Miranda IM, Martinho R, Rijo R, Herausgeber. Encyclopedia of E-health and telemedicine. Hershey, PA: Medical Information Science Reference, an imprint of IGI Global; 2016.

Module Name:	Image Processing
German name:	Bildverarbeitung
Study Semester:	5th semester
Module Coordinator:	Prof. Dr. Thomas Schrader
Main Lecturer(s):	Prof. Dr. Thomas Schrader
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**

Level within Curriculum:	B.Sc. Medical Computer Science, B.Sc. Computer Science 5th semester
Teaching Methods:	Lecture: 2 hrs weekly per semester Exercise: 2 hrs weekly per semester
Workload:	150 hrs = 60 contact hrs and 90 hrs direct self-study
Credit Points:	5
Prerequisites according to Study and Exam Regulations:	
Recommended Prerequisites:	Fundamentals of Medicine Fundamentals of Medical Informatics
Learning Outcome / Skills:	Understanding The students know the different types of images and their use in a medical context. They understand the different modalities of image generation. Analyse You can evaluate and present data from the evaluate and present data from the above-mentioned sources. Evaluate The students can evaluate the image data regarding the quality and content of the image data. They are able to identify relevant information in the data. Apply You will apply different algorithms of image processing algorithms to improve quality, segmentation and classification of classification of medical images. You will program algorithms in Python or Matlab. Create You are able to plan an image analytical process independently and to carry it out.
Course Content:	Imaging procedures in medicine CT, MRT, US, X-ray Virtual microscopy Image analysis Histograms, grey value distributions, colour spaces Filtering, segmentation, classification, Evaluation Advanced methods of image analysis: Deep-Learning
Mode of Assessment:	Written exam, semester-long performances can be included in the assessment.
Teaching Media:	Lecture, exercises
Literature:	Zhou SK, Greenspan H, Shen D. Deep learning for medical image analysis [Internet]. 2017 [zitiert 12. Juli 2017]. Access: http://public.eblib.com/choice/publicfullrecord.aspx?p=4789490 2. Solomon C, Breckon T. Fundamentals of digital image processing: a practical approach with examples in Matlab. Chichester, West Sussex ; Hoboken, NJ: Wiley-

	Blackwell; 2011. 328 p. 3. García GB, Herausgeber. Learning image processing with OpenCV: exploit the amazing features of OpenCV to create powerful image processing applications through easy-to-follow examples. Birmingham: Packt Publ; 2015. 208 S. (Packt open source). 4. Bovik AC. The essential guide to image processing. London ; Boston: Academic Press; 2009. 853 S

Department of Computer Science and Media: Master modules

See also https://informatik.th-brandenburg.de/studium/plaene-und-termine/vorlesungsverzeichnis/ for up-to-date information!

Module Name:	Lab-Course Master Project 1 (various topics)
German name:	Projekt I
Study Semester:	1st semester
Module Coordinator:	Dean of Studies Digital Media
Main Lecturer(s):	Several lectureres
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	Computer Science M.Sc., 1st semester Digital Media M.Sc., 1st Semester
Teaching Methods:	
Workload:	120 hrs = 45 contact hrs- und 75 hrs direct self-study
Credit Points:	6
Prerequisites according to Study and Exam Regulations:	Further information will follow soon.
Recommended Prerequisites:	
Learning Outcome / Skills:	The students will be able to solve practice-related problems and current developments in the field of computer Science Medical Informatics or Digital Media, to research them and to develop goal-oriented solutions. The students acquire the necessary creative-technical skills, scientific methodology and social skills for project organization and realization in a team.
Course Content:	see descriptions of the associated courses
Mode of Assessment:	Ungraded course work, see descriptions of the corresponding courses
Teaching Media:	see descriptions of the associated courses
Literature:	see descriptions of the associated courses

Module Name:	Digital Health
German name:	eHealth
Study Semester:	1st/2nd/3rd semester
Module Coordinator:	Prof. Dr. Thomas Schrader
Main Lecturer:	Prof. Dr. Thomas Schrader
Teaching Language:	German, for exchange students English possible. **Please let us know your course choice early to inform the lecturer of your participation.**
Level within Curriculum:	Computer Science M.Sc., 1st semester Medical Informatics
Teaching Form:	Lecture: 2 SWS

	Seminar: 1 SWS Exercise: 1 SWS
Workload:	180 h = 60 h in presence und 120 h self-study
Credit Points:	6
Prerequisites according to Study and Exam Regulations:	//
Recommended Prerequisites:	Computer-supported medicine Software engineering Project management
Literature:	Ekaterina Kldiashvili: Grid Technologies for E-Health, IGI Global, July 31, 2010 Joel Rodrigues: Emerging Communication Technologies for E-Health and Medicine, IGI Global April 30, 2012 Anastasius Moumtzoglou; Anastasia Kastania: EHealth Systems Quality and Reliability: Models and Standards, IGI Global, 31-AUG-2010 Maria Cruz-Cunha; Antonio J. Tavares; Ricardo Simoes: Handbook of Research on Developments in E-Health and Telemedicine, IGI Global, 31-DEC-2009 Joel Lawhead: Learning Geospatial Analysis with Python - Second Edition, Packt Publishing, 31-DEC-2015

Department of Engineering: Bachelor Modules

Program:	Mechanical Engineering (B.Eng.)
Module name:	Computational Methods with SMath Studio
German name	Numerische Methoden mit SMath Studio
ID	CMSS
Study semester:	5th
Regular cylcle:	Annually in winter term
Module coordinator:	Prof. Dr.-Ing. Martin Kraska
Lecturer:	Prof. Dr.-Ing. Martin Kraska
Teaching language:	English
Assignment to the curriculum	Elective module in Mechanical Engineering (B.Eng.)
Teaching methods:	2 h per week lecture, 2 h per week guided lab work
Workload:	150 h, thereof 60 h in presence and 90 h self-study
Credit points:	5 CP
Formal prerequisites	none
Recommended prerequisites:	Informatics, Mathematics
Learning outcome:	The students understand the concept of SMath Studio as a tool for performing and documenting engineering calculations. They understand the power and the limitations of numerical procedures and can implement and use them in SMath Studio documents. They can run performance tests and use the debug tools of SMath Studio. They understand the impact of symbolic and numeric evaluation. They understand how to efficiently make use of scientific units in SMath documents. The students know advanced options for data analysis and high quality plots.

Content of the course	• SMath Studio and it's ecosystem • Handling of scientific units • Handling of matrices, linear algebra • Linear systems and eigenvalue problems

Program:	Mechanical Engineering (B.Eng.)
Module name:	Joining Technology
German name	Fügetechnik
ID	JT (FüTe)
Optional course:	Joining technology lecture and lab exercises
Study semester:	5th
Regular cylcle:	Every winter term
Module coordinator:	Prof. Dr.-Ing. Sven-Frithjof Goecke
Lecturer:	Prof. Dr.-Ing. Sven-Frithjof Goecke
Teaching language:	English
Assignment to the curriculum	Elective module in Mechanical Engineering (B.Eng.)
Teaching methods:	3 h/week lecture, 1 h/week lab exercise
Workload:	150 h, 60 in presence, 90 self study
Credit points:	5 CP
Formal prerequisites	none
Recommended prerequisites:	Manufacturing Technology 1 and 2
Learing outcome:	The student can select joining processes with regard to technological requirements and cost-effectiveness and use them optimally, taking into account all components and their interactions as a complete system for a given manufacturing problem in mechanical engineering, considering technological, economic, and ecological aspects. Through additional laboratory exercises, students learn about joining processes in practical examples of the selection and application of welding processes, of material selection, joining processes including their automation, and weld seam testing in a holistic view and apply them. This provides students with the basic knowledge for the development, planning, execution, and control of joining production facilities and their operation in industrial production.
Content of the course	Introduction to the basics of welding and joining technology Overview, classification, theoretical foundations, and application of joining processes for fusion and pressure welding, i.e. fusion welding and brazing: arc, laser, and electron beam welding, resistance welding, and mechanical joining processes such as riveting and forming

	Weldability: weld suitability, weld safety, and weldability Fundamentals of material science for joining technology (heat treatment of steels and aluminum alloys, time-temperature transformation diagrams, metallurgical processes during welding) Basics and application of welding processes (heat generation and input into the component, measurement and calculation of strain energy, welding equipment and their characteristics, mechanization and automation, quality assurance of processes and joined components) Laboratory exercises Welding: thermal welding with SMAW, GTAW, GMAW, and laser beam welding, mechanical joining with clinching and self-piercing riveting Cutting: plasma, laser, and water jet cutting Automation: welding with a 6-axis articulated robot including optical seam tracking with laser cameras.
Mode of assessment:	Written exam
Teaching media:	Lecture: Blackboard and slide presentation with integrated videos and demonstration pieces, lecture notes. Lab exercises: Blackboard presentation, demonstration pieces and written lab instructions
Literature	• Welding Processes Handbook. A volume in Woodhead Publishing Series in Welding and Other Joining Technologies, Klas Weman, Woodhead Publishing 2012, ISBN: 978-0-85709-510-7 • Technology of Welding and Joining,Tomasz Węgrzyn , Ed. Published: June 2021 Pages: 196, ISBN 978-3-0365-0886-3 / ISBN 978-3-0365-0887-0 (PDF), https://doi.org/10.3390/books978-3-0365-0887-0 • Fundamentals of Metal Joining, Processes, Mechanism and Performance. Dheerendra Kumar Dwivedi, ISBN: 978-981-16-4819-9, DVS-Fachbücher, Band 161, 1. Auflage 2016, • Grundlagen der Fügetechnik - Schweißen, Löten und Kleben, ISBN: 978-3-945023-49-5. Author: Reisgen, U., Stein, L. • English Edition, Band: 13, 1. Auflage 2016, Fundamentals of joining technology Welding, brazing and adhesive bonding, ISBN: 978-3-945023-76-1, • DVS-Fachbücher, Band 128/S, Kompendium der Schweißtechnik Band 1-4 ISBN: 978-3-87155-204-5 • DVS-Fachbücher, Band 76/I und 76/II • Handbuch der Schweißverfahren Teil I: Lichtbogenschweißverfahren, ISBN: 978-3-87155-184-0, Author: Schweißfaching. R. Killing • Handbuch der Schweißverfahren Teil II: Autogentechnik, Thermisches Schneiden, Elektronen-/Laserstrahlschweißen, Reib-, Ultraschall- und Diffusionsschweißen, ISBN: 978-3-87155-093-5, Author: Prof. Dr.-Ing. Prof. h.c. D. Böhme, F.D. Hermann

Course of study:	MPE, MAnT, MEVT
Module name:	Interdisciplinary Project 1
German name	Interdisziplinäres Projekt 1
if nec. caption:	
if nec. course:	
Study semester:	5th semester
Regular cycle:	annually in winter semester
Module coordinator:	Prof. Dr.-Ing. Peter Flassig
Lecturer:	Prof. Dr.-Ing. Peter Flassig
Teaching language:	English
Assignment to the curriculum:	MPE, 5th semester, mandatory subject MAnT, 5th semester, mandatory subject MEVT, 5th semester, mandatory subject
Teaching methods:	Lecture: 1 h weekly per semester, Exercise: 1 h weekly per semester, Project: 2 h weekly per semester; Introductory presentation and explanations, self-study, teamwork, regular mentoring and discussion with the lecturers
Workload:	150 h, thereof 60 h in presence and 90 h self-study
Credit points:	5 CP
Prerequisites according to study and exam regulations:	none
Recommended prerequisites:	Basic engineering studies, subject-specific specializations as well as the compulsory courses from mandatory subjects relevant to the specific project from the product development, drive engineering or energy and process engineering.
Learning outcome / skills:	The students get an insight into project work in the context of a suitable, technical development project and learn about the phases of an agile product development process. They expand their competencies in technical communication (research, reports, presentations, drawings, procurement, ...), teamwork and in the field of agile working (Scrum framework, Kanban, ...).
Course content:	The project to be developed can be proposed by students themselves or selected from given projects. It will be agreed upon at the beginning of IP1. For example, a suitable project would be the development, manufacturing, commissioning and testing of CNC controlled small machines, such as 3D printers, milling machines, engraving machines, cutting plotters, coordinate measuring machines and the similar, where the following work has to be done: - mechanical design for the machine frame, - selection and design of drive technology for the motion axes and working tools, - process chain from CAD model to motion sequence,

	- analysing the behaviour and determining the influence on the manufacturing quality. In each project, the analysis of the task, teamwork, concept development, concept presentation, detailed design and documentation are to be learned and carried out in an agile working method. Furthermore, the goal is to carry out the parts production with the help of the central workshop of the THB and the open workshop as well as to realize the assembly and commissioning, the demonstration and measurement.
Mode of assessment:	The study and examination requirements are communicated at the beginning of the module. They include, among other things, presentations, product documentation, written tests.
Teaching media:	Depending on the task, e.g. literature, company brochures, laboratory equipment and measuring instruments, material data, regular consultation of the project group
Literature:	Special literature is recommended depending on the task.

Course of Study:	Industrial Engineering *Wirtschaftsingenieurwesen (B.Eng)*
Module name:	Logistics
if nec. abbreviation:	WING_LOG1
if nec. caption:	Basics of Logistics 1 *Grundlagen der Logistik 1*
if nec. course:	
Study semester:	5
Regular cycle:	annually in winter semester
Module coordinator:	Prof. Dr.-Ing. Juliane Schneeweiß
Lecturer:	Dr. Romy Niemann
Teaching language:	English
Assignment to the curriculum:	betriebswirtschaftliches Wahlpflichtfach
Teaching methods:	2 SWS Vorlesung, 2 SWS Übung
Workload:	150 h, davon 60 h Präsenz und 90 h Eigenstudium
Credit points:	5
Prerequisites according to study and exam regulations:	None
Recommended prerequisites:	None
Learning outcome / skills:	Students will be able to - acquire basic skills in the field of logistics to prepare optimal decisions on a quantitative basis, and - can analyse a company's logistical processes.
Course content:	Basics of logistics Logistics strategies Procurement logistics - sourcing concepts, - procurement organization, - supplier management, - strategic procurement processes, - operational procurement processes, Internal transport and handling systems Storage and picking systems Logistics service provider
Mode of assessment:	Homework/presentations and written examination on lecture and exercise content Grading: Yes
Teaching media:	Blackboard, projector, BBB, LMS (Moodle), PC, etc.
Literature:	GLEISSNER UND FEMERLING: *Logistics – Basics, Exercises, Case Studies*. Springer, 2014. LAMBERT, STOCK UND ELLRAM: *Fundamentals of Logistics Management*. Irwin/McGraw-Hill, 1998.

	GÜNTHER UND TEMPELMEISER: *Produktion und Logistik*. Springer, 2000. KUMMER , GRÜN UND JAMMERNEGG: *Grundzüge der Beschaffung, Produktion und Logistik*. Pearson, 2018. PIONEK: *Bausteine des Logistikmanagements*. Nwb, 2009. PFOHL: *Logistiksysteme, Betriebswirtschaftliche Grundlagen*. Springer, 2010. SCHULTE: *Logistik, Wege zur Optimierung der Supply Chain*. Vahlen, 2017. SCHULTE: *Material- und Logistikmanagement*. Oldenburg, 2001. TEMPELMEIER: *Material-Logistik*. Springer, 2008.

Module Name	Fundamentals of Mathematical Modeling and Optimization
Course of Studies	
Person in Charge	Prof. Robert J. Flassig
Semester	
Language	For exchange students in English. Please contact us for further information.

English name:	Energy and Process Engineering
German name:	Labor und Seminar Energie- und Verfahrenstechnik
Semester:	Summer Semester
Curriculum	MEVT, 6. Semester, Pflichtfach
ECTS:	5
Lecturer	Prof. Dr.-Ing. Robert J. Flassig
Language	German or English

Modul name:	Complex Systems Modeling and Analysis			Short name:	**CSMA**
Semester:	7	ECTS-credits:	5	Attendance hours per Week:	4
Elective from subject	Ba-MB, WiIng				
Responsible:	Robert Flassig				
Lecturer:	**Robert Flassig**			Written by:	**Robert Flassig**
Parts:	Part 1: Introduction to Python Part 2: Complex Systems Analysis				
Offer:	Annual, Winter semester				
Work load:	The total workload corresponds to 5 ECTS, equating to 150 hours of study.			Teaching language: English	

Modul name:	Complex Systems Modeling and Analysis	Short name:	**CSMA**
	This includes lecture attendance, self-study, practical exercises, homework completion, and exam preparation.		
Prerequisites:	Ma I, II		
Prerequisites:	Basic knowledge in programming (Python preferred), fundamentals of energy systems, and mathematics.		
Learning outcomes:	Upon completing this module, students will be able to: Understand the various aspects of complex systems in general and energy system modeling as an important archetype of complex systems; Develop a basic energy system model using Python; Learn the basic principles of operation and design of energy systems; Get familiar with the components of energy systems and how they interact with each other; Perform economic analysis and optimization of energy systems; Analyze model outcomes and elaborate on their implications; Use open-source models to construct comprehensive energy system models; Explore and design innovative approaches in transforming an energy system.		
Learning outcomes:	Upon completing this module, students will be able to: 1. Develop critical thinking skills through the analysis and interpretation of complex systems, particularly in the context of energy system modeling. 2. Enhance problem-solving abilities by designing, optimizing, and analyzing energy system models to address real-world challenges. 3. Cultivate interdisciplinary understanding by integrating knowledge from various fields such as economics, engineering, and environmental science in the study of energy systems. 4. Improve technical proficiency in Python programming specifically applied to modeling and data analysis tasks. 5. Strengthen research skills by exploring and evaluating innovative approaches in energy system transformation and model construction. 6. Foster teamwork and collaboration skills through group projects and discussions on energy system design and innovation. 7. Enhance communication skills by articulating model outcomes, optimization strategies, and their implications for energy system transformation in both written and oral forms. 8. Build adaptability and lifelong learning capabilities by using open-source models and staying current with emerging technologies and methodologies in energy systems research.		
Content:	Part 1: Introduction to Python (2.5 Credits): Data structures, conditions, control flow, functions, and libraries (NumPy, Pandas); Time Series analysis and plotting. Part 2: Complex Systems Analysis (2.5 Credits): Fundamentals of complex systems in general, and in detail energy systems including demand, generation, grid, and storage components; Optimization techniques for energy systems; Introduction to Python for power system analysis.		
Exams:	The module concludes with a research project, where students will submit a written report on a selected topic within the scope of energy system modeling and analysis.		

Modul name:	Complex Systems Modeling and Analysis	Short name:	**CSMA**
Media formats:	Whiteboard, slides, programming, computer		
Literature:	A list of recommended literature will be provided at the beginning of the course, including textbooks and online resources.		

Brief module label:	Realtime Systems
Module description:	
semester:	Summer Semester
Level:	Bachelor
curriculum	Elective of the Master's programme in Mechanical Engineering
ECTS:	5
Lecturer	Prof. Kramann
Language	German, for exchange students English. Content available upon request

Brief module label:	Simulation and steering systems
Module description:	
Semester	Summer Semester
Level:	Bachelor
curriculum	Elective of the Master's programme in Mechanical Engineering
ECTS:	5
Lecturer	Prof. Kramann
Language	German, for exchange students English. Content available upon request

Department of Engineering: Master Modules

Program:	Mechanical Engineering (M.Eng.)
Module name:	Scientific Project
German name:	Wissenschaftliche Praxis
ID	SP (WPA)
Study semester:	1th/2nd
Regular cylcle:	Every term
Module coordinator:	Prof. Dr.-Ing. Sven-Frithjof Goecke
Lecturer:	Prof. Dr.-Ing. Sven-Frithjof Goecke

Teaching language:	English
Assignment to the curriculum	Compulsory module in Mechanical Engineering (M.Eng.)
Teaching methods:	Project work with colloquium
Workload:	180 h
Credit points:	6 CP
Formal prerequisites	none
Recommended prerequisites:	
Learning outcome	During the independent completion of an interdisciplinary project, students can deepen their accumulated knowledge by exchanging ideas with their peers and applying their acquired skills. The project work prepares them for the challenges of a master's thesis. Through working in a team, they develop their social competence, including conflict resolution, cooperation, and communication skills. They are aware of the advantages and challenges that arise from teamwork, and take responsibility for their actions. Students are capable of solving complex problems using methods for idea generation and evaluation, such as brainstorming, variant discussions, and morphological boxes. They are skilled in strategic project management methods such as project planning using project schedules, identification of work packages, and milestone setting. They are capable of defining goals independently. Upon project completion, students are able to present their results to a professional or lay audience in the form of scientific reports or presentations.
Content of the course	The students work independently in a team of two on a freely chosen, practical topic (internal or external, 1st or 2nd semester, according to the Module Handbook for Mechanical Engineering (M.Eng.), status as of 16.08.2016). The specific content is derived from the problems posed by company or university projects. The project is concluded with a scientific final report and a presentation. The following aspects will be evaluated: • Task definition (presentation, classification, preparation) • Literature review (research results, citation style)

	• State of the art (comprehensibility, relevance to the task) • Concept (description, justification) • Elaboration (presentation, level, substance) • Results (presentation, reliability) • Report (meeting deadlines, structure, formal correctness, use of tables and figures) • Presentation (quality of slides, presentation, discussion) • Poster (message, advertising effectiveness) The project work can be carried out across multiple semesters, but participation in both project colloquia with subsequent grading is mandatory. Exceptions must be discussed with the Dean of Studies.
Mode of assessment:	Written report (similar to Bachelor thesis) and presentation at the colloquium
Teaching media:	
Literature	Lubbers B.-W.: Teamintelligenz, 1. Auflage Gabler Verlag Wiesbaden 2005 Litke, H.-D.: Projektmanagement. Methoden, Techniken, Verhaltensweisen. Evolutionäres Projektmanagement, 5. Auflage, München 2007 Meier, M.: Projektmanagement, Situationsanalyse, Zielbestimmung, Projektcontrolling. Controllingwerkzeuge, Motivation, Teammanagement, Stuttgart 2007 Further literature tob e selected by the students according to the field of research.

Course of study:	Energy Efficiency of Technical Systems (M.Eng.)
Module name:	Specialisation Lightweight Design
if nec. course:	Lightweight Design
Study semester:	1st / 2nd semester
Regular cycle:	annually in summer semester
Module coordinator:	Prof. Dr.-Ing. Peter Flassig
Lecturer:	Prof. Dr.-Ing. Peter Flassig
Teaching language:	english
Assignment to the curriculum:	ENEF (M.Eng.), optional subject
Teaching methods:	Lecture / 4 h weekly per semester
Workload:	180 h, thereof 60 h in presence and 120 h self-study
Credit points:	6 CP
Prerequisites according to study and exam regulations:	none
Recommended prerequisites:	Technical Mechanics 1 (Statics) and 2 (Strength of Materials), basics in Finite Element Methods (FEM)
Learning outcome / skills:	The students - know the load-bearing and deformation behavior of typical lightweight structures (discs, shells, plates, thin-walled profiles, sandwiches, ...) and are able to make analytical estimates for the behavior of such structures, - are able to define idealizations for real structures, to derive mechanical substitute models and to decompose structures into suitable substructures, - learn how to use FEM and methods of virtual product development, - know typical construction methods, strategies, principles, key figures and materials of lightweight construction, - know the advantage of lightweight structures for dynamic processes and acquire the basics of elastodynamics of lightweight structures, and - gain insight into current developments in manufacturing technology and development methods.
Course content:	Introduction - Examples / Applications - Costs / Benefits - Construction methods / materials / indicators Elasticity theory - State of plane stress - State of plane strain - Material law Isotropic disks and plates - Differential equations and solutions - Sections

	- Instabilities: Buckling, pipe buckling Thin-walled section bars - Longitudinal force and bending, neutral axis, principal axes of inertia - Shear force and shear center - Torsion and arch torsion Anisotropic disks and plates - Strength theory - section loads, deformations - buckling Sandwich surfaces - Strength of materials - sectional loads, deformations - buckling Dynamics - rotating and oscillating components - 1st and 2nd order theory
Mode of assessment:	Homework / presentations and oral or written exam. Grading: Yes
Teaching media:	blackboard and colored chalk, projector
Literature:	Bernd Klein, Leichtbau-Konstruktion, Vieweg Johannes Wiedemann, Leichtbau 1: Elemente, Springer Johannes Wiedemann, Leichtbau 2: Konstruktion, Springer

Course of study:	Energy Efficiency of Technical Systems (M.Eng.) & Mechanical Engineering (M.Eng.)
Module name:	Safety and reliability
if nec. abbreviation:	SuZ
if nec. caption:	
if nec. course:	Safety and reliability
Study Semester:	1st / 2nd semester
Regular cycle:	annually in winter semester
Module coordinator:	Prof. Dr.-Ing. Robert Flassig
Lecturer:	Prof. Dr.-Ing. Robert and Prof. Dr.-Ing. Peter Flassig
Teaching language:	English
Assignment to the curriculum:	Energy Efficiency of Technical Systems, mandatory subject; Mechanical Engineering, optional subject
Teaching methods:	Lecture / 4 h weekly per semester
Workload:	180 h, thereof 60 h in presence and 120 h self-study
Credit points:	6 CP
Prerequisites according to study and exam regulations:	none
Recommended prerequisites:	Basics of probability theory
Learning outcome / skills:	The students - know the probabilistic basics and relationships between probability density and cumulative distribution functions (pdf and cdf) as well as probability and can apply them confidently to technical systems, - are able to determine quantitative safety and reliability evaluations for technical systems and to state their resilience, - can evaluate service life tests and determine failure statistics, - know the difference between classical and structural reliability assessments, and - can define limiting state functions for technical systems and estimate failure probabilities on the basis of defined uncertainties via Monte Carlo simulations.
Course content:	Motivation and background - historical development, cost vs. reliability, - examples / applications (beams, Wöhler curve, ...). Reliability and safety parameters - terms and terminology, - failure / defect, failure types / defect modes, MTTF, MTBF, failure density, survival probability, failure rates, - "bathtub curve". Probability theory basics - random variables, - pdfs, cdfs, probability,

	- characterization of random variables (measures for location and scatter), - estimators. Failure rate models and lifetime distributions - normal distribution, exponential distribution, Weibull distribution, - evaluation of fatigue tests (classical) reliability-based system design, - reliability structure, series, parallel and mixed arrangements, - function graphs, block diagram and system equation, - examples (e.g. freewheel, ...). Methods of safety and reliability assessment - deterministic and probabilistic approaches, - fault tree analysis / impact analysis / DFSS / ... Structural reliability assessment - motivation, classical and structural reliability assessment of technical systems, - types, classification and description of uncertainties, - limiting state and failure probabilities, - Monte Carlo simulation as numerical integration method for estimation of failure probabilities.
Mode of assessment:	Written exam, Grading: Yes
Teaching media:	Blackboard, projector, BBB, LMS (Moodle), software (e.g. MatLab, Python, …)
Literature:	EBERLIN UND HOCK: *Zuverlässigkeit und Verfügbarkeit technischer Systeme.* Springer, 2014. BERTSCHE: *Zuverlässigkeit im Fahrzeug- und Maschinenbau: Ermittlung von Bauteil- und System-Zuverlässigkeiten*. Springer, 2006. BIROLINI: *Reliability Engineering*. Springer, 2013. BUCHER: *Computational Analysis of Randomness in Structural Mechanics*. London: Taylor & Francis Group, 2009. THOFT-CHRISTENSEN AND BAKER: *Structural Reliability Theory and Its Applications*. Springer, 1982. FIESSLER U.A.: *Numerische Methoden für probabilistische Bemessungsverfahren und Sicherheitsnachweise*. Forschungsbericht, SFB 96, Heft 14. TU München, 1976. RUBINSTEIN: *Simulation and the Monte Carlo Method*. John Willey & Sons Inc., 1981.

Course of study:	Energy Efficiency of Technical Systems (M.Eng.) & Mechanical Engineering (M.Eng.)
Module name:	Interdisplinary Project
if nec. abbreviation:	Project
Study Semester:	1st / 2nd semester
Regular cycle:	Each semester (winter semester, summer semester)
Module coordinator:	Prof. Dr.-Ing. Robert Flassig
Lecturer:	Prof. Dr.-Ing. Robert and Prof. Dr.-Ing. Peter Flassig
Teaching language:	english
Assignment to the curriculum:	Energy Efficiency of Technical Systems, mandatory subject
Teaching methods:	Interdisciplinary exercise, group size: 2-6 students
Workload:	
Credit points:	6 CP
Prerequisites according to study and exam regulations:	none
Recommended prerequisites:	Basics of probability theory
Learning outcome / skills:	The student masters the: - interdisciplinary processing of a practical task in a team: identification with the task (literature and market research, state of the art, the environment...), defining the project and the project goal in the team. - Application of methods for finding ideas and their evaluation: discussion of variants (brainstorming), morphological box - Methodical-strategic project planning and implementation: project structuring and milestone planning, fine structuring into sub-processes and responsibilities, project planning by means of project flow charts and identification of work packages, capacity plan, cost plan - Project organisation and problem analysis: performance of leadership tasks (coordination, team leadership, definition of liabilities and responsibilities to solve the task), enhancement of the social competence of all team members, development of an interdisciplinary dispute culture, practical application of motivation ,discussion management and decision-making techniques) - Project completion: Preparing scientific interim and final reports as well as preparing and carrying out presentations.
Course content:	The contents result from the task
Mode of assessment:	Assessment of project and presentation, assessed group work, grading: Yes
Teaching media:	Blackboard work, PowerPoint presentations, writing a scientific thesis
Literature:	Lubbers B.-W.: Teamintelligenz, 1. Auflage Gabler Verlag Wiesbaden 2005 Litke, H.-D.: Projektmanagement. Methoden, Techniken, Verhaltensweisen. Evolutionäres Projektmanagement, 5. Auflage, München 2007

	Meier, M.: Projektmanagement, Situationsanalyse, Zielbe-stimmung, Projektcontrolling. Controllingwerkzeuge, Motiva-tion, Teammanagement, Stuttgart 2007 Further literature will be announced in the course.

English name:	Mathematical Optimization
German name:	Mathematische Optimierung
Semester:	Summer Semester
Curriculum	Energieeffizienz technischer Systeme (M.Eng.), Pflichtmodul, 1./2. Semester Maschinenbau (M.Eng.) Pflichtmodul 4, 1./2. Semester
ECTS:	6
Lecturer	Prof. Dr.-Ing. Robert J. Flassig
Language	German or English

English name:	Energy Storage System
German name:	Energiespeicher
Semester:	Summer Semester
Curriculum	Energieeffizienz Technischer Systeme (M.Eng.), Wahlpflichtmodul, 1./2. Semester
ECTS:	6
Lecturer	Prof. Dr.-Ing. Robert J. Flassig
Language	German or English

Brief module label:	Development of Autonomous Mobile Systems
Module description:	
semester:	Summer Semester
Level:	Master
curriculum	Elective of the Master's programme in Mechanical Engineering
ECTS:	6
Lecturer	Prof. Kramann
Language	German, for exchange students English. Content available upon request

Brief module label:	Introduction to Laser Technology and Laser Material Processing
Study programme	Mechanical Engineering (M.Eng.)
Semester:	1. Semester
Semester:	Summer semester
lecturer	Prof. Justus Eichstädt
Language	For exchange students English
Total workload and its composition:	Lecture 2 hours/week, lab 2 hours/week
Workload:	180 h, 60 h contact hours, 120 h self study
ECTS	6 ECTS

Additional Subjects

Brief module label:	DaF
Module description	German as a Foreign Language
Type of module:	Seminar
Duration of module:	one semester
Classification in the curriculum:	Extra offer
Usability of the module	The exact level of the course will be determined based on the participants' German language proficiency.
Frequency:	each semester
Author:	Jutta Kunze, M.A.
Lecturer:	Monika Martincevic
Language of instruction:	English and German
Prerequisites:	None
ECTS-Credits:	3
Total workload and its composition:	75 h: 60 h contact hours, 15 h self-study
Form of teaching /semester hours per week	4 semester hours per week
Study and examination achievements	Written examination
Weighting of the grade in the overall grade:	-
Learning outcomes:	- Development of general language vocabulary (informal and formal level) - Development of communication skills for successful participation in discussions in everyday communication and study situations - Development of competences in reading, writing and listening with different types of texts - Intercultural findings from the comparison of culturally selected priorities (Germany - home country) - Improving grammatical skills (depending on the initial level)
Contents:	- Different forms of vocabulary work - Oral and written communication tasks - Adapted and/or original, partly current reading and listening texts (depending on proficiency level) on various topics (for example, work/profession, sports, doping, media ...)
Teaching and learning methods	Teacher input, pair work, group work, learners lecture, exercises in teams, work with audio and video files.
Literature:	Different books for German as a foreign language Journals, newspapers and websites

Brief module label:	Geschichte der Stadt Brandenburg
Module description	History of the city of Brandenburg
Type of module :	Seminar
Duration of module:	one semester
Classification in the curriculum:	Extra offer
Usability of the module	The module can be used regularly for exchange students.
Frequency:	each semester
Author:	Dr. Hans-Georg Kohnke
Lecturer:	Dr. Hans-Georg Kohnke
Language of instruction:	German and English
Prerequisites:	None
ECTS-Credits:	2 – winter semester, 3 – summer semester
Total workload and its composition:	50 h: 50 h contact hours – winter semester 75 h: 75 h contact hours – summer semester
Form of teaching /semester hours per week	5 blocked sessions winter semester, 6-7 blocked sessions summer semester
Study and examination achievements	Oral exam
Weighting of the grade in the overall grade:	
Learning outcomes:	The students gain knowledge about over a thousand years history of the Brandenburg city and Germany in general by visiting several museums and cultural sites
Contents:	- Over thousand years of German history in the Town Museum and city walk - Brandenburg Cathedral and Cathedral Museum - Industrial Museum in the old Steelworks - Brandenburg Archaeological State Museum - Berlin: Parliament – Reichstag, Brandenburg gate and German Historic Museum - Only summer semester: Canoeing tour around Brandenburg with Olympic game winner - Only summer semester: additional museum
Teaching and learning methods	Guided tours and discussions, presentations

Brief module label:	Profiling Germany
Module description:	Profiling Germany
Programme/Semester:	Module for international students
Duration of module:	One semester

Classification in the curriculum:	Additional module for foreign students Minimum number of participants: 6
Usability of the module:	The module can also be employed in other (Bachelor's/Master's) courses according to the regulations of studies and examinations applicable there.
Frequency of offering of modules:	Every academic semester
Lecturer:	Regina Schalinski (M.Ed. / Dipl. Betriebswirtin (FH))
Language of instruction:	English
Prerequisites:	Basic knowledge about Germany
ECTS-Credits:	5
Total workload and its composition:	150 hours of workload: - approx. 60 hours of attendance - approx. 30-40 hours of preparation and follow-up - approx. 50-60 hours assignments and project work
Form of teaching/semester hours per week:	This course is taught in 6 blocked sessions as workshop sessions at THB and / or excursions and on two sessions for project consultations and/or to visit project partners. In addition, student teams will implement their projects at project partner institutions in Brandenburg. For details please check: Detailed Course Outline on Moodle.
Study and examination achievements:	Home assignments and presentations
Learning outcomes:	- to gain knowledge about German Society - to improve understanding of German culture - to raise awareness of similarities and differences between Germany/German culture and one´s own culture/home country - to develop skills for successful interactions in intercultural settings
Contents:	German Society, History and Culture compared to participants´ cultures / countries of origin.
Teaching and learning methods:	lectures / workshops, case studies, exercises, excursions/study trips, assignments, project work
Literature:	An overview about relevant literature will be available via Moodle
Additional information:	Excursions to places in Brandenburg / Berlin relevant to the course content