

Catalogue of courses offered in English - WiSe 2024/25



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Dear exchange students,

This catalogue gives you an overview of courses conducted in English at the Ohm in winter semester 2024 that all exchange students can participate in.

On the one hand the catalogue includes **electives** that are open to all students at the Ohm. Attending these courses you can not only develop your academic knowledge but also gain experience in a truly diverse environment.

On the other hand you can also find **courses offered within certain degree programmes** that have been opened for exchange students regardless of the degree programme they are enrolled in at the Ohm. You can participate in any course you are interested in as long as you meet the prerequisites.

We hope you find some interesting options for this semester in Nuremberg in addition to the courses from our Language Center and the regular courses in your degree programme. Have a look - it's worth your while! If you have any questions about the courses you can take, please contact the coordinator of this catalogue, Rebecca Ehrig, at rebecca.ehrig@th-nuernberg.de.

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Area Studies - Doing Business in China (3 ECTS)

Course name	Area Studies - Doing Business in China (3 ECTS)
Learning objectives	<p>In the past few decades China has developed into one of the most powerful national economies in the world and has thus expanded its social and political influence not only in Asia, but also worldwide. For Europe, China is one of the most important cooperation partners in many areas, but at the same time it is also a serious competitor and rival in other areas. Knowing and understanding China is therefore becoming a crucial competence for all responsible actors in our society.</p> <p>This course will equip students with foundational knowledge about the history and culture as well as the recent political and economic development in China. One of the focus areas will be the changing role of China in the world economy during the globalization/deglobalization process. Another focus area is to gain insight into different business and inter-cultural aspects when doing business in and with China. Group discussions will help the students apply their new knowledge in order to efficiently develop their competence.</p> <p>After successful participation in this course students will:</p> <ul style="list-style-type: none"> - know the historical background and the current political and economic system of the country - understand the international positioning of the country in a globalized business environment - be able to assess country-specific opportunities and risks for international and local companies when doing business in and with the country - be able to demonstrate how regional culture impacts business and management practice - be able to work or conduct business with local people both in the country/region and internationally - be able to correctly apply subject-specific English terminology/vocabulary
Content	<ul style="list-style-type: none"> - Introduction and historical background of the country - The current political system and recent societal development - National/regional economy and its international positioning - Economic relationship between the region and EU / Germany - How international companies operate in (e.g.) China - Strategic positioning and uniqueness of local companies - Regional culture and its influences on companies' strategic management frameworks and intercultural communication - Geographical scheme of the regional/country/area
Other requirements/information	<p>Basic knowledge of business administration is required.</p> <p>There is a 3 ECTS and a 5 ECTS version of this course. Students can only take one of them.</p>

Course format	Seminar-style lecture
Credits (ECTS)	3
Lecture hours (LVS)	4
Type of assessment	Written examination (90 minutes)

Area Studies - Doing Business in China (5 ECTS)

Course name	Area Studies - Doing Business in China (5 ECTS)
Learning objectives	<p>In the past few decades China has developed into one of the most powerful national economies in the world and has thus expanded its social and political influence not only in Asia, but also worldwide. For Europe, China is one of the most important cooperation partners in many areas, but at the same time it is also a serious competitor and rival in other areas. Knowing and understanding China is therefore becoming a crucial competence for all responsible actors in our society.</p> <p>This course will equip students with foundational knowledge about the history and culture as well as the recent political and economic development in China. One of the focus areas will be the changing role of China in the world economy during the globalization/deglobalization process. Another focus area is to gain insight into different business and inter-cultural aspects when doing business in and with China. Group discussions will help the students apply their new knowledge in order to efficiently develop their competence.</p> <p>After successful participation in this course students will:</p> <ul style="list-style-type: none"> - know the historical background and the current political and economic system of the country - understand the international positioning of the country in a globalized business environment - be able to assess country-specific opportunities and risks for international and local companies when doing business in and with the country - be able to demonstrate how regional culture impacts business and management practice - be able to work or conduct business with local people both in the country/region and internationally - be able to correctly apply subject-specific English terminology/vocabulary
Content	<ul style="list-style-type: none"> - Introduction and historical background of the country - The current political system and recent societal development - National/regional economy and its international positioning - Economic relationship between the region and EU / Germany

	<ul style="list-style-type: none"> - How international companies operate in (e.g.) China - Strategic positioning and uniqueness of local companies - Regional culture and its influences on companies' strategic management frameworks and intercultural communication - Geographical scheme of the regional/country/area
Other requirements/information	<p>Basic knowledge of business administration is required.</p> <p>There is a 3 ECTS and a 5 ECTS version of this course. Students can only take one of them.</p>
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Written examination (90 minutes); case study presentation

Climate Change – Changing Economy

Course name	Climate Change - Changing Economy
Learning objectives	Students will be familiar with the basics of climate change and its implications for the economy and society. Students will become more aware of potential political and economic reactions to climate change. The economic changes resulting from climate change will be discussed.
Content	<ul style="list-style-type: none"> - Climate relevant gases in the atmosphere and relevant legalities - Anthropogenic emissions and their influence on the climate - Potential of technical developments: Energy supply, energy efficiency, CO2 storage, and adaptation to climate change - Political frameworks and economic change: International agreements, emissions law, product carbon footprint.
Other requirements/information	
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Written examination (90 minutes)

Computer Science

Course name	Computer Science
Learning objectives	<ul style="list-style-type: none"> - Basic understanding of algorithms and software engineering - Knowledge about the formalism and utilisation of a high level computer language - Ability in programming distinct tasks - Ability to analyse, understand, and modify simple given computer programs - Knowledge of English computer science terminology
Content	<ul style="list-style-type: none"> - Algorithms in computer science - Numeral systems and information coding - The program development process, problem analysis, algorithm development, and implementation in a computer language - Programming Python, computing platforms, and Python's development environment - The principle structure of Python programs, variables, operators, key words, expressions, functions and procedures, modules, errors, and debugging - Object-oriented programming, classes, and methods - Programming event-driven flows of operation - Practical work with the computer
Other requirements/information	The course is designed for engineering students. Previous knowledge is not necessary.
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Written examination (90 minutes)

Constructive Conflict Transformation

Course name	Constructive Conflict Transformation
Learning objectives	In this seminar we will analyse models of constructive conflict transformation (i.e., mediation, power-model, value-based models, etc.), to discuss challenges in approaching conflicts constructively. After completing the module, you will be able to critically evaluate and develop conflict transformation models by applying social and psychological perspectives. During the seminar you will acquire an understanding of the elements of conflicts (e.g. personal patterns, values, culture, structural aspects). In addition, you will be able to critically evaluate what constitutes a successful conflict transformation model. Finally, you will acquire the skills to apply the discussed models in your professional and personal environment.
Content	<p>The character of the seminar is based on intensive interaction between participants through interactive dialogue and critical discussions.</p> <p>The content of the seminar will be the analysis of social and psychological oriented conflict models, mediation, patterns based on needs and fears, value-based conflicts, and structural aspects of organizational challenges.</p> <p>The seminar is structured in two aspects: (1) interactive introduction to the analysis of conflict models, (2) analysis of personal and structural conflicts by the students</p>
Other requirements/information	The methodological emphasis of the course is on practical exercises and interactive dialogue. Therefore, the successful completion of the course requires active participation in all sessions.
Course format	Seminar-style lecture
Credits (ECTS)	3
Lecture hours (LVS)	3
Type of assessment	Paper

Digital Transformation of Healthcare Providers

Course name	Digital Transformation of Healthcare Providers
Learning objectives	<ul style="list-style-type: none"> - Students apply principles and methods for creating a digital transformation strategy in a healthcare context. - Students design and assess strategic maps. - Students master the basic principles of balanced scorecards. - Students understand the challenges and approaches of digital transformation for a healthcare provider. - Students are able to develop strategic maps and derive digital transformation strategies from them.
Content	<ul style="list-style-type: none"> - To effectively achieve digital transformation in healthcare, providers such as hospitals, medical care centers, long-term care facilities, rehabilitation clinics, and private practices, must master and apply the correct principles and methods in clinical practice. Interdisciplinary environments and the changing requirements of primary and secondary business processes must be addressed using innovative socio-technical information systems. - The first part of the module covers the following topics: <ul style="list-style-type: none"> • Pre-requisites for digitization, interoperability, and digital transformation • Information systems as the backbone of patient care processes • Enhancing efficiency through the digitization of patient care • Post-phase of the Hospital Future Fund • Innovative digital applications throughout the treatment pathway • Using Digital Balanced Scorecards to create strategic maps - The second part of the module involves student presentations and written reports. Students select a question from a range of real-world application examples and develop a digital transformation strategy based on the knowledge gained in the first part. They then present their strategic maps and formalise the digital transformation strategy in the context of the original question.
Other requirements/information	Recommended prior knowledge in fundamentals of health informatics, organisational project management, AI in healthcare, IT architecture, IT management.
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Student research project and presentation (30 minutes)

Electromagnetic Compatibility (EMC) in Practice

Course name	Electromagnetic Compatibility (EMC) in Practice
Learning objectives	<ul style="list-style-type: none"> - Basic knowledge of electromagnetic compatibility (EMC), including the basic understanding of international standards and the phenomena which are covered by them - The EMC-conform development of electronic devices, including the design of shielding, the layout of printed circuit boards, and the use and design of EMC filters
Content	<p>The lecture includes the following topics:</p> <ul style="list-style-type: none"> - <u>International standards for EMC:</u> The international standards for consumer products will be addressed. We will discuss the phenomena behind the standards and where they occur in normal life. - <u>Test procedures according to international standards:</u> Most of the tests will be set up during the lectures. We will learn how to use the test equipment and we will discuss how to improve the devices under test in the case that they cannot pass the test. - <u>How to develop electronic devices:</u> The lecture will provide EMC know-how, how to realize good shielding, how to identify a good EMC-compliant PCB (printed circuit board) layout. The use of EMC filters will also be considered. Experiments related to all of these topics will be covered, to allow participants to test good and bad EMC designs.
Other requirements/information	<p>Electromagnetic compatibility is increasingly important for our life with advancing technology because EMC ensures that devices will not disturb each other by electromagnetic waves.</p> <p>Basic electrotechnics or physics knowledge is necessary for this lecture. Previous knowledge about EMC is not required.</p>
Course format	Seminar-style lecture combined with experiments and practical demonstrations
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Written examination (90 minutes)

Generative Design, Additive Manufacturing, and Artificial Intelligence

Course name	Generative Design, Additive Manufacturing, and Artificial Intelligence in Architecture
Learning objectives	<p>In this course, students are expected to achieve the following objectives:</p> <ul style="list-style-type: none"> - Explore different design options for a defined design task using algorithmic and data-driven design approaches - Explore artificial intelligence as an area of research with experimental application in the design process - Develop a design system and a connected building design, which will be presented in a workbook, poster presentation, and 3D-printed architectural model
Content	<p>Based on the learning objectives, students will:</p> <ul style="list-style-type: none"> - Learn how to use parametric design as a tool for design explorations - Learn the theoretical and philosophical background for the argumentation and application of digital design technology and artificial intelligence - Gain hands-on experience in design and use of advanced algorithms for design tasks
Other requirements/information	<p>The course is designed for students in the programmes in Architecture, Civil Engineering, Design, Media Engineering and other fields of study with keen interest in digital technologies.</p> <p>Experience with computer-aided design is strongly recommended. Knowledge and experience in use of digital design techniques such as 3D-modeling, building information modelling, and parametric design are advantageous.</p> <p>Students must pay about 50 euros for material for the 3D printer.</p>
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Oral presentation

Global Software Engineering

Course name	Global Software Engineering
Learning objectives	The learning objective of this course is integration of programming, software engineering, and project management with intercultural skills to plan, analyse, design, and develop a global software project.
Content	Students will work together with project partners from a university in another country on a real-time simulation of a global software engineering project.
Other requirements/information	<p>Master's level for information systems, computer science, media computer science is required.</p> <p>Prerequisites:</p> <ul style="list-style-type: none"> - English - programming skills - software engineering skills - project management skills
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Project presentation; written report

Health Economics Evaluation

Course name	Health Economics Evaluation
Learning objectives	<ul style="list-style-type: none"> - Students use basic theories and concepts from the field of health economics. - Students develop an understanding of the impact of decisions in healthcare, taking economic criteria into account. - Students select and apply methods of health economic evaluation. - Students are familiar with healthcare as an economic problem of allocation and distribution. - Students are able to apply the basic principles of economic behaviour as well as the types of costs and benefits relevant to business administration and health economics.
Content	<ul style="list-style-type: none"> - Introduction to Health Economics - Learning the Fundamentals of Health Economic Evaluation - Measurement of Costs and Benefits - Assessment of Quality of Life Effects

	<ul style="list-style-type: none"> - Methods of Health Economic Evaluations: Cost and Disease Cost Studies as well as Comparative Methods - Economic Evaluation Methods - Assessment and Decision Making - Application of Health Economic Evaluation
Other requirements/information	Recommended prior knowledge in health and digitization, hospital management, and applied statistics
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Written examination (90 minutes)

Impact Entrepreneurship – Developing Social and Ecological Innovations

Course name	Impact Entrepreneurship - Developing Social and Ecological Innovations
Learning objectives	<p>The aim is to connect students from all Faculties and to enable them to jointly develop interdisciplinary solutions for social and/or ecological problems using innovative methods. Examples of these are acute and global challenges such as biodiversity loss, climate change, environmentally friendly production/additive manufacturing, nutrition, and smart cities.</p> <p>By taking the course, sustainable, impact-oriented action can be experienced and solutions to global problems are developed. Through this course, you will not only learn a range of methods to address global challenges, but also develop a deeper understanding of these challenges, which is especially enhanced through interdisciplinary collaboration.</p>
Content	<p>You will learn advanced knowledge in the field of impact entrepreneurship (i.e., solving social and/or ecological problems through innovative methods). Furthermore, you will learn how to develop your own sustainable solutions for social and/or ecological challenges. In addition to obtaining a foundation of scientifically based content on impact entrepreneurship, you will learn the necessary tools and their application in practice-oriented workshops and will also be personally advised in a team by the interdisciplinary lecturers.</p>

	<p>Schedule:</p> <ol style="list-style-type: none"> 1. Kick-off event (topic/problem presentation) 2. Interactive workshops (development of ideas/solutions, business models) 3. Independent development of the project 4. Personal coaching (individual team advice) 5. Final presentations 6. Submission of the concept
Other requirements/information	The course is open to all students. No prerequisites.
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Presentation; paper

Improv Theatre and Spontaneity

Course name	Improv Theatre and Spontaneity
Learning objectives	<p>This seminar aims to enhance students' spontaneity and creativity, equipping them with tools to respond productively to unexpected situations. Participants will be encouraged to embrace role-playing exercises, including those relevant to professional contexts, fostering a more dynamic approach to various scenarios. The course will address stage fright, teaching students to harness nervous energy positively, not only in theatrical settings but also in other high-pressure situations such as job interviews and presentations.</p> <p>Through playful and interactive methods, students will learn to adopt different perspectives, sharpening both self-perception and awareness of others. This approach will open doors to new aesthetic experiences and broaden their understanding of diverse viewpoints. Additionally, the seminar will explore the potential and challenges of participatory improvisation exercises, encouraging critical reflection on these techniques.</p> <p>By the end of this course, students will have developed a versatile skill set that enhances their adaptability, creativity, and interpersonal communication in both personal and professional spheres.</p>

Content	<p>Improvisation theatre is a dynamic form of performing arts where scenes are developed spontaneously without a script. It promotes creativity, spontaneity, and teamwork, valuable skills that are transferable to other contexts.</p> <p>The course includes a variety of practical elements such as theatre exercises, performance practice, and reflection sessions. Students will engage in both group work and individual tasks. A special focus is placed on storytelling, body language, speech, and spontaneity exercises aimed at improving expression and quick thinking. Participants will have the opportunity to improvise scenes with given elements as well as "free scenes" to apply and deepen their newly acquired skills in practice. These activities encompass theatre and performance exercises, narrative techniques, physical expression, language skills, and spontaneity practices. Through improvising scenes with structured prompts and open-ended scenarios, students will refine their skills in spontaneous thinking and effective collaboration.</p>
Other requirements/information	<p>The seminar languages are German and English. Knowledge of one of these languages is sufficient. No prior experience is required. Participants with and without theatre experience are welcome, and the formation of a diverse group is desirable.</p> <p>Initially, the seminar will focus on forms, exercises, and games that facilitate access to storytelling improvisation for beginners while also helping those with prior experience enhance their skills.</p>
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Active participation; practical exam; written assignments

Introduction to Bionic Computation in Business

Course name	Introduction to Bionic Computation in Business
Learning objectives	<p>Course Goals:</p> <ul style="list-style-type: none"> - Introduction to algorithms which mimic biological systems in nature - Practical application of bionic computation algorithms using analytical information systems to optimise business processes in enterprises <p>Key Outcomes:</p> <ul style="list-style-type: none"> - Analysis and modelling of business case studies - Application of analytical information systems to optimize business processes - Ability to present project results in oral and written form in English
Content	<p>Theoretical foundations:</p> <ul style="list-style-type: none"> - Evolutionary Computation - Neural Networks - Swarm Intelligence (e.g. Ant Colony, Particle Swarm) - Sentiment Analysis <p>Practical exercises:</p> <ul style="list-style-type: none"> - Modelling and analysis of business cases to identify problems - Application of bionic computation algorithms to solve the problems identified in the business cases
Other requirements/information	This course is offered by the Faculty of Computer Science as part of the bachelor's degree programmes in Computer Science. The course is designed for bachelor's students who have experience in computer programming and an understanding of statistics.
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Project presentation (30 minutes) and project documentation (10 pages)

Introduction to Excel and VBA in Science and Engineering

Course name	Introduction to Excel and VBA in Science and Engineering
Learning objectives	<p>In this course, students will be enabled to phrase mathematic formulations from scientific or technical problems, define an approach for a solution as an algorithm, and solve the algorithm with help of Excel and the VBA programming language.</p> <p>After successful completion of the course, students are expected to achieve the following objectives:</p> <ul style="list-style-type: none"> - use Excel spreadsheets efficiently to solve scientific and engineering problems - use VBA to extend the features of Excel according the requirements of typical scientific and engineering tasks - use VBA to improve efficiency and re-usability of spreadsheets for solutions in their own fields of study - analyse quantitative measurement data with appropriate numerical methods, find appropriate mathematic models, and evaluate the models - solve non-linear equations numerically with help of Excel and/or VBA
Content	<ul style="list-style-type: none"> - Spreadsheet calculation with Excel - Relative and absolute cell references - Scientific diagrams - General mathematic and statistic Excel functions - User-defined functions in VBA - Linear regression - Non-linear regression - Modifying Excel spreadsheets with VBA - Solving non-linear equations with numerical methods in Excel and/or VBA
Other requirements/information	The course is designed for students in natural science and engineering fields.
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Written examination (60 minutes)

Introduction to R: Statistical Data Analysis with R for Beginners

Course name	Introduction to R: Statistical Data Analysis with R for Beginners
Learning objectives	In this course, students are expected to carry out univariate, bivariate, and multivariate statistical analysis using the R program and R-Studio. The cycle is focused on the implementation of the regression and variance analysis in line with graphical representations for cross-sectional studies.
Content	<ul style="list-style-type: none"> - Working with R: functions ("q", "sum", "c" etc.), objects and object types (definition and connection of objects, vectors, factors, data frames, saving and loading of objects) as well as arguments (e.g. "digits" etc.) - Working with data sets: data entry, import of data sets, joining data sets, selecting, labeling, recoding, calculating new variables ("dplyr" package) - Univariate statistics: frequency tables, indicators (mean values, variance etc.) - Bivariate and multivariate statistics: contingency measures, correlation coefficients, bivariate and multiple regression, one-way analysis of variance, tests and confidence intervals for cross-sectional studies - Graphics: charts ("ggplot2" package), plot functions, editing of graphics - Brief introduction to "Markdowns" <p>The content is conveyed in an application-oriented manner using exercises. Students will create their own script in R based on the processing of the tasks. At the end of the course they will be able to carry out regression and variance analysis with R independently.</p>
Other requirements/information	<p>The course is designed for students of all disciplines who are interested in statistical evaluations. Basic statistical knowledge is necessary.</p> <p>The course is conducted online.</p>
Course format	Seminar-style lecture (online)
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Written assignments

Introduction to SAP ERP

Course name	Introduction to SAP ERP
Learning objectives	In this course, students learn the basic technical-organisational concepts of an integrated enterprise resource planning system (ERP system) using the example of SAP ERP based on SAP HANA. This will enable them to understand and evaluate the possible uses and development of such systems in a business context. After completing this course, students will be able to name and explain the basic principles and significance of the in-memory database SAP HANA for companies.
Content	<ul style="list-style-type: none"> - SAP history - Introduction to SAP ERP - SOA technology and SAP NetWeaver - SAP business suite - SAP user interface - SAP NetWeaver application server with ABAP and Java - SAP components - SAP system administration - SAP workflow and document management - ABAP/4 programming environment - SAP HANA as an in-memory database platform - SAP S/4 HANA based on the SAP HANA platform as a next-generation real-time ERP business suite (digital transformation) <p>Based on the learning objectives, students will:</p> <ul style="list-style-type: none"> - Learn the basic technology and architecture of the SAP ERP system. - Learn the functionality of SAP HANA. - Understand the technical-organisational relationships between the basic system and the subject-specific application modules. - Plan and implement practical tasks within the scope of system administration. - Be able to demonstrate current development of SAP ERP systems
Other requirements/information	The course is designed for students of all disciplines interested in the use of enterprise software SAP ERP. No prior knowledge is necessary.
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2

Type of assessment	Oral examination
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Light Metals

Course name	Light Metals
Learning objectives	<p>Metallic materials that have a density lower than steel are referred to as light metals or alloys. Such metals have particular and increasing importance in engineering, when lightweight construction is required. Especially in the automotive and aircraft industry, light metals are widely used.</p> <p>This course provides a basic understanding of the three main alloy systems in that field, aluminium, titanium, and magnesium alloys. The physical metallurgy of the materials as well as typical processing routes and applications are covered in the course.</p>
Content	<p>After general considerations on materials for lightweight construction, the course teaches basic knowledge for the most common alloys of that materials class. These are wrought aluminium (Al) alloys, cast Al alloys, titanium alloys, and magnesium alloys. For these materials, an introduction into specific aspects of their physical metallurgy is presented and correlated to resulting properties and microstructures. Furthermore, typical ways to process these materials and their main fields of applications are covered.</p>
Other requirements/information	<p>The course is meant to give particular knowledge on metallic materials for lightweight applications.</p> <p>The course is designed to for undergraduate students of materials science and may also be appropriate for other fields of engineering related to mechanics and construction. Basic knowledge of materials science, physics, and chemistry is required.</p>
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Written examination (90 minutes)

Mathematics I

Course name	Mathematics I
Learning objectives	<p>After successful participation in this course students will:</p> <ul style="list-style-type: none"> - recall and be able to apply basic mathematical notions, methods and tools - classify and extend mathematical problems in single variable calculus and linear algebra (vectors and matrices) - demonstrate knowledge and understanding of basic differential and integral calculus, complex numbers, vectors and matrices and some more advanced techniques of calculus - explain and choose as well as apply fundamental mathematical techniques to solve problems related to economics and natural science - get comprehensive knowledge about correct application of subject-specific terminologies and Vocabulary in English
Content	<p>The course includes the following topics:</p> <ol style="list-style-type: none"> 1. Functions (single variable) 2. Complex numbers 3. Vectors 4. Linear algebra 5. Differentiation of single variable functions 6. Integrals of single variable functions 7. Sequences, Taylor and power series
Other requirements/information	Course is designed for engineering students. Students should be able to understand the basics of secondary school mathematics (algebra, calculus).
Course format	Seminar-style lecture
Credits (ECTS)	7
Lecture hours (LVS)	6 (+2)
Type of assessment	Written examination (90 minutes)

Mathematics III

Course name	Mathematics III
Learning objectives	<p>After successful participation in this course students will be able to:</p> <ul style="list-style-type: none"> - apply descriptive statistical methods to prepare, illustrate, and analyse data - understand the basic concepts of probability theory - apply theoretical results to compute probabilities and other statistics in practical settings - understand the key concepts of inferential statistics - construct confidence intervals and carry out hypothesis tests in specific settings
Content	<p>The course includes the following topics:</p> <ol style="list-style-type: none"> 1. <u>Descriptive statistics</u> <ul style="list-style-type: none"> - graphical illustration of data samples using histograms, box plots, or scatter plots - sample statistics such as sample mean, sample variance, sample covariance, quantiles - linear regression 2. <u>Basics of probability theory</u> <ul style="list-style-type: none"> - events, probabilities, conditional probabilities, independence - random variables, probability distributions, cumulative distribution function, probability mass function, probability density function - expectation, median, variance, covariance, quantiles - specific probability distributions: binomial, Poisson, geometric, uniform, exponential, and normal distribution - law of large numbers and central limit theorem 3. <u>Inferential statistics</u> <ul style="list-style-type: none"> - parameter estimation: method of moments, maximum likelihood estimation - confidence intervals for the mean of a distribution - hypothesis tests for the mean of a distribution
Other requirements/information	The course gives a short introduction into statistics and is intended for undergraduate students. Knowledge of fundamentals of mathematics, particularly in analysis, is required.
Course format	Seminar-style lecture
Credits (ECTS)	3
Lecture hours (LVS)	2
Type of assessment	Written examination (90 minutes)

Medical Data Science

Course name	Medical Data Science
Learning objectives	<ul style="list-style-type: none"> - Students apply mathematical and statistical methods and concepts to healthcare datasets. - Students design and assess the application of the results of their analyses in everyday clinical practice. - Students utilise concepts and standards of scientific work. - Students are familiar with data science methods and their application in the healthcare context and can critically reflect on the results. - Students are able to prepare and present their results in a team according to scientific standards.
Content	<ul style="list-style-type: none"> - Mathematical-statistical, medical, informatics, and regulatory fundamentals applied in example healthcare use cases. - Data science methods applied to the given healthcare use case using appropriate software.
Other requirements/information	Recommended prior knowledge in fundamentals of mathematics, introduction to computer science, applied statistics, process and data management, and AI in healthcare
Course format	Seminar-style lecture
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Student research project as part of group work and presentation (30 minutes)

Migration Politics

Course name	Migration Politics
Learning objectives	<p>The aim of the seminar is to acquire a thorough knowledge about migration politics in order to understand the current debate on immigration in an academic as well as practice-oriented manner.</p> <p>After the seminar, students will:</p> <ul style="list-style-type: none"> - be able to distinguish and compare developments of different phases of migration politics and policies and its historical context in Germany and Europe - be able to identify consensus and discordancies about immigration politics among actors in national as well as the EU levels - have gained knowledge about the impact of immigration on politics and the emergence of new actors and their stances on the topic - have gained knowledge about the integration of refugees and migrants, public opinion, diversity, and perspectives for the future - be able to describe central theoretical strands of flight, migration (push and pull factors), and causes of the current flight and immigration flows
Content	<p>To achieve the above-mentioned goals, the seminar is divided into three central parts:</p> <ol style="list-style-type: none"> 1. <u>Overview</u> To explain the current issues and debate related to asylum and immigration policies, this part explores and classifies the immigration developments and policy changes in the last few decades. It provides insight to better grasp the current debate and understand how and which factors have shaped migration policies and gradually liberalised citizenship laws. In doing so, the EU's role, migrants' perspectives, and their social situation will also be considered. 2. <u>The current state of affairs</u> This part covers various aspects of the debate on immigration, integration, citizenship law, identity, and ethno-cultural diversity. The actors of the current debate and their interests, public opinion, and perspective for the future will be differentiated and classified. Challenges and opportunities posed by migration will be discussed and scrutinized. 3. <u>Push and pull factors</u> This part provides theoretical knowledge about and empirical evidence of the reasons for mobility and immobility in today's world and shed light on the current situation of flight and asylum in Europe as well as Germany.
Other requirements/information	The course is designed for all students of all faculties. Participants should be able to write their term papers in English or German.

Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Presentation; paper

Sustainable Buildings - Designing, Constructing and Living Green

Course name	Sustainable Buildings - Designing, Constructing, and Living Green
Learning objectives	The main aim of this course is to create an awareness for the buildings we live in. Almost 40% of all global emissions are produced through the building sector. A large proportion of these through housing. By taking a look at the whole life cycle of a building, students will gain an insight into the impact that can be made through designing, planning, constructing, operating, and removing buildings in a green and more environmentally friendly way. There will be a focus on how small decisions regarding the design, materials, or the energy concept can influence the carbon footprint of a building. The overall aim is to develop an awareness for the way we live and to understand how individuals can contribute towards a more sustainable built environment.
Content	After taking a look at the historical development of housing and different ways of living around the world, we are going to study the different disciplines of construction and understand how a more sustainable approach can contribute towards saving resources and reducing our energy consumption. We will not only be looking at individual buildings but different housing concepts and their impact on society. Based on case studies and good practices, both the structural and technical elements of buildings will be examined. The whole life cycle, from the inception to the completion, including the removal and recycling of the building will be taken into consideration. Moreover, the usefulness of building systems and certificates, such as Passive House, DGNB or LEED, will be examined and discussed.
Other requirements/information	All students interested in our built environment or studying something construction related, i.e. architecture, civil engineering, building services engineering, are welcome.
Course format	Seminar-style lecture
Credits (ECTS)	2
Lecture hours (LVS)	2
Type of assessment	Course assignments; presentation

“What’s the fuss about Gender?”- Introduction to Gender Studies

Course name	“What’s the fuss about Gender?”- Introduction to Gender Studies
Learning objectives	Despite the fuss about it in (social) media and politics, many of us do not necessarily know if we feel concern about gender, and consequently, we know little about how to frame and approach new and ongoing debates. In this course, we will take first steps toward understanding and exploring how gender shapes our world.
Content	This course serves as an introduction to gender itself —as a social/cultural construct, as a mode of expression (performativity), and as a critical lens through which we can better understand the world around us. During the semester, we will get acquainted with the field of gender studies as practiced across a range of academic disciplines. We will consider the ways in which gender is produced and performed at the intersection of culture, politics, and the body, always in tandem with other categories of difference such as race, sexuality, and economic class. We will ask how institutions like the government, the workplace, and the family interact with gender. We will contemplate the ways in which ideology (systems of ideas and knowledge) and representation (portrayals in media, political discourse, and everyday life) shape our understanding of gender and how it is produced and reproduced by taking up current (public) debates and conversations (e.g., #metoo movement, abortion rights, LGBTQ+). Rather than assuming that binaries like masculine/feminine, queer/straight, or transgender/cisgender are stable or static concepts, we will work toward understanding how their meanings change over time and space, and how they relate to the broader context of gender in the world today.
Other requirements/information	<p>There are no prerequisites to taking part in this course. Students from all academic disciplines are explicitly encouraged to attend this course.</p> <p>We will discuss some politically and perhaps emotionally charged topics during the semester. Thus, we are called upon to approach these discussions with maturity, intellectual curiosity, emotional care, and an open mind.</p> <p>Basic expectation: read. Give yourself time to think about and process the readings. Take notes. Attend lecture and discussion sections. Participate. Think and process more.</p> <p>Assignments: Regular attendance in class, reading the assigned texts, sharing your responses to course material and ideas in class, oral presentation of chosen topic.</p>
Course format	Seminar-style lecture
Credits (ECTS)	3
Lecture hours (LVS)	2

Type of assessment	Reading the texts, participation, presentation
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Wind and Geothermal Energy

Course name	Wind and Geothermal Energy
Learning objectives	<p>Upon completion of the course, students should be able to</p> <ol style="list-style-type: none"> 1. apply the relevant methods of wind energy resource assessment 2. describe the types and operation of wind turbine generators 3. evaluate the economic viability and environmental compatibility of wind plants and wind farms 4. take the necessary steps for the location assessment or site selection for a wind energy plant 5. report and discuss technological foundations and present them orally as related to specialist and societal problems 6. describe exploration as well as types and operation of systems for the utilisation of geothermal energy 7. identify possible applications and select suitable processes and components for the utilisation of geothermal energy 8. apply the acquired fundamentals for the basic design of geothermal power plants 9. report and discuss technological foundations of geothermal power, present them orally, and assess and judge practical problems
Content	<ul style="list-style-type: none"> - Energy scenarios, report and discuss technological foundations of geothermal power, present them orally, and assess and judge practical problems. renewables, wind as a resource for energy production, - Basic atmospheric concepts, evolution in time, variability and turbulence, wind speed distribution, wind rose, and wind profile - Wind resource measurement, site selection, meteorological instruments, quality and validation of wind resource measurements, representation, and analysis of wind data - Wind turbine generators (WTG): parts of a turbine, classification, power curve, basic concepts of wind turbine aerodynamics, control, grid integration and coupling - Wind farm design, micrositing, plant selection, yield prediction and cost efficiency of WTG, logistics of project implementation, onshore and offshore, environmental impact, future trends - Introduction to geothermal energy, fundamental terms, potential, classification of geothermal fields, technical applications - Basics of exploration (drilling) and hauling - Geothermal power plants, thermodynamic fundamentals, components, design criteria - Parameters influencing the realisation of geothermal projects, mining law, licensing, financing, market situation, damage scenarios - Visit to a geothermal power plant

Other requirements/information	Physics or engineering students, who have completed at least 10 credits of thermodynamics, 5 credits of heat transfer, and 5 credits of fluid mechanics. Basic knowledge of materials science and about energy engineering instruments is also sensible.
Course format	Seminar-style lecture, exercises
Credits (ECTS)	5
Lecture hours (LVS)	4
Type of assessment	Written examination