

Course Descriptions General Engineering

Summer Semester 2026

12 February 2026

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German (different course levels)

Course title	see schedule Language Centre
ECTS	4
Course type	Seminar
SWS	4
Semester	Winter and summer
Workload in hours	60 hrs
Assessment method	Written examination, 90 min.
Language of instruction	German

Please find here the course descriptions for German language courses at all course levels:
<https://th-deg.de/en/students/language-electives#german>

English in Technical Contexts B2

Course title	English in Technical Contexts B2
ECTS	2
Course type	Language training course
SWS	2
Semester	Winter and summer
Course level	<p>B2</p> <ul style="list-style-type: none"> • Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialization • Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party • Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options
Lecturer	Neal O'Donoghue, MA
Course objectives	<p>This course aims to deepen students' encounter with the English language in a technical context by giving practical training in specialized vocabulary, grammar and language usage. The four cardinal language skills - listening, speaking, reading, and writing - will play an integral role in this training.</p> <p>The course is designed to be relevant and interesting for engineering students and will be adapted to their learning needs and study areas.</p> <p>By the end of the course, participants should have a more</p>

comprehensive understanding of, and enhanced fluency in, the English language in an engineering context.

Course contents

Obligatory topics (60 %):

- Numbers and mathematical operations
- Shapes and dimensions
- August 2017
- Basic physics and the scientific worldview
- Materials and their properties
- Case study on an area related to technology
- /physics/engineering
- Grammar/ communication skills

Variable content (40 %):

Variable content will be determined on the basis of a student survey conducted in the first session.

Current world events (including news events and popular culture) and recent technological innovations may be used as a basis for discussions.

Teaching methods

Teaching methods focus on improving the four cardinal language skills and include group discussions and group projects; individual work; mini-presentations; role-plays; close reading and listening activities; dictation; grammar games; and various follow-up viewing and writing activities.

Work not completed in class should be done at home. Self-study assignments will be set on a weekly basis.

Assessment method

Written exam (60 min)

No dictionaries are allowed.

Exam structure:

- Part 1: Listening comprehension(s)
 - Part 2: Reading comprehension(s)
 - Part 3: Vocabulary and technical content
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- Part 4: Grammar (maximum 10% of total exam points, excluding writing exercise)
 - Part 5: Writing composition (150-200 words)

The exam will be based on topics covered during the semester.

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Astley, Peter, and Lewis Lansford. *Engineering 1: Student's Book*. Oxford: Oxford UP, 2013. Print.

Bauer, Hans-Jürgen. *English for Technical Purposes*. Berlin: Cornelsen, 2000. Print.

Bonamy, David. *Technical English 4*. Harlow, England: Pearson Education, 2011. Print.

Bonamy, David, and Christopher Jacques. *Technical English 3*. Harlow: Pearson Longman, 2011. Print.

Brieger, Nick, and Alison Pohl. *Technical English: Vocabulary and Grammar*. Oxford: Summertown, 2002. Print.

Recommended Literature

Dummett, Paul. *Energy English: For the Gas and Electricity Industries*. Hampshire: Heinle, Cengage Learning, 2010. Print.

Dunn, Marian, David Howey, and Amanda Illic. *English for Mechanical Engineering in Higher Education Studies Coursebook*. Reading: Garnet Education, 2010. Print.

engine: *Englisch für Ingenieure*. <www.engine-magazin.de> (Darmstadt). Various issues. Print.

Foley, Mark, and Diane Hall. *MyGrammarLab*. Harlow: Pearson, 2012. Print.

Glendinning, Eric H., and Norman Glendinning. *Oxford English for Electrical and Mechanical Engineering*. Oxford: Oxford UP, 1995. Print.

Glendinning, Eric H., and Alison Pohl. Technology 2. Oxford: Oxford UP, 2008. Print.

Heidenreich, Sharon. English for Architects and Civil Engineers. Wiesbaden: Vieweg + Teubner Verlag, 2008. Print.

Ibbotson, Mark. Cambridge English for Engineering. Cambridge: Cambridge UP, 2008. Print.

Ibbotson, Mark. Professional English in Use. Engineering: Technical English for Professionals. Cambridge: Cambridge UP, 2009. Print.

Markner-Jäger, Brigitte. Technical English: Civil Engineering and Construction. Haan-Gruiten: Verl. Europa-Lehrmittel, 2013. Print.

Murphy, Raymond. English Grammar in Use. Cambridge: Cambridge UP, 2004. Print.

Schäfer, Wolfgang. Construction Milestones: Englisch Für Bau-, Holz- Und Anlagenberufe. Stuttgart: Klett, 2013. Print.

Wagner, Georg, and Maureen Lloyd. Zörner. Technical Grammar and Vocabulary: A Practice Book for Foreign Students. Berlin: Cornelsen, 1998. Print.

Language of instruction

English

Prerequisites

B1 / Abitur (A-levels/ school leaving certificate giving right of entry to higher education) / 7-9 years of English

Intercultural Training for Germany and Bavaria

Course title	Intercultural Training for Germany and Bavaria
ECTS	1
Course type	Elective
SWS	1
Semester	Winter and summer
Workload in hours	30 hours
Name of Instructor	Lisa Werner
Course objectives	Participants get an understanding of the different theories of “culture” and learn about stereotypes and traditions in Bavaria. Furthermore, the participants get information on Germany and Bavaria as well as the Deggendorf Institute of Technology.
Course contents	<ol style="list-style-type: none"> I. Culture (theroies) II. Customs and Rituals in Germany/Bavaria III. Information on Germany and Bavaria and the DIT IV. Quiz and Presentation V. Culture Shock
Recommended literature	<p>Bolten J. und Ehrhardt C., Interkulturelle Kommunikation, Verlag Wissenschaft & Praxis 2003;</p> <p>Bolten J, Einführung in die interkulturelle Wirtschaftskommunikation, Vandenhoeck & Ruprecht 2007</p>
Teaching methods	The course is organized according to four pillars:

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1. Culture
 2. Customs and Rituals
 3. Information on Germany/Bavaria
 4. Culture Shock

Whereas hard facts are taught in a classical lecture style, students will do lots of role-plays, critical incidents, short movies and do a quiz.

Assessment method	Paper
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Language of instruction	English/German
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Prerequisites	None
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Business and Society in China & Emerging Asia

Course title	Business and Society in China & Emerging Asia
ECTS	2
Course type	Elective
SWS	2
Semester	Summer
Workload in hours	Total: 60 / In-class: 30 / Self-study: 30
Lecturer	Prof. Dr. Wei Manske-Wang
Course objectives	<ul style="list-style-type: none"> • Awareness of foreign cultures and understanding their causes • Think out of the box and establish global horizons • Preparing for the challenges of future professional life in a global environment • Doing business in China/Asia successfully requires a holistic view on China/Asia and a thorough understanding how business is done there! This course aims at providing students with the necessary knowledge about contextual determinants of business practice (culture, politics, economy, society, history) and introduces exemplary reference cases.
Course contents	<ul style="list-style-type: none"> • The historical roots of China: What are structural legacies of the past? How do Chinese perceptions of history influence the present society? • The institutional setting of the Chinese economy: What are the main actors in the Chinese economy (state-owned enterprises, private-owned businesses)?

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- The political system and its ramifications in the domain of economic policy and business: What is the role of the Communist Party? What are the principal decision makers on different levels of government? How does this affect central aspects of business environment such as corporate governance?
 - What is behind Chinese long-term strategy “Belt and road initiative”?
 - Culture and societal values: China represents an amazing mix of global metropolitan life and a resurgence of tradition, deeply enmeshed in her high-speed urbanization process that continue shaping the country in the last decades.
 - What do you know about Chinese philosophies in the past? What do you know about Chinese values today?
 - What are implications for business, such as regarding consumer demand of young generation?
 - Behavioural aspects of business practice: The Chinese are **famous for networking**. We look at the ‘Chinese way’ in establishing social relations in the business domain. Further, we explore Chinese organizational behaviour in companies.
 - **What are ‘mega-trends’ of the future affecting the outlook for Chinese business?** We touch on issues such as demographic change, looming environmental crises, digitalization and the question of political stability.
 - Institutions and strategic arrangements in Asia: ASEAN, APEC, BRICS, BRI, RCEP etc.
 - More countries in Asia: Japan, India, Vietnam, Indonesia etc.
 - Is an Asian Century dawning?
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Recommended literature	Hofstede, G.; Hofstede G.J. (2009): Lokales Denken, globales Handeln: Interkulturelle Zusammenarbeit und globales Management. 4. Auflage. München: Deutscher Taschenbuch Verlag
	Thomas, A.; Kammhuber S.; Schroll-Machl, S. (Hg.) (2007): Handbuch Interkulturelle Kommunikation und Kooperation Band 2: Länder, Kulturen und interkulturelle Berufstätigkeit. 2. Auflage. Göttingen: Vandenhoeck & Ruprecht
Teaching methods	Lecture, Press Monitoring, Case Studies, Discussions, Group Work, Q&A
Assessment method	Group works - Written Assignment (50%) & Final Presentation (50%)
Language of instruction	English

Social Responsibility and Initiative in a University Context

Course title	Social Responsibility and Initiative in a University Context
Course ID	344
ECTS	2
Course type	Elective
SWS	2
Semester	Winter and summer
Lecturer	Matthias Koeppen

Students who take an active role in university association, committee, or similar, or assume social responsibility within the university context can earn ECTS points for their outstanding contributions.

Developing a deeper understanding of the importance of social engagement and responsibility in society, particularly in the university environment.

Course objectives

Acquisition of practical skills in organising and implementing projects within student associations, committees, etc.

Personal development through the promotion of responsibility, teamwork, communication, and leadership skills via active participation in association activities, meetings, committees, etc.

Reflection on personal and professional development through engagement during studies and the application of theoretical concepts in practice.

Course contents	<p>Students explore the topic of social responsibility and engagement within the university context. The course offers a unique opportunity to gain practical experience through active participation in student associations, committees, etc., and to achieve outstanding accomplishments, which will be rewarded with ECTS points.</p> <ul style="list-style-type: none">• Introduction to the concepts of social responsibility and civic engagement.• Analysis of successful projects and initiatives both within and beyond the university walls.• Planning and implementation of individual projects within the university context.• - Regular reflection and discussion of experiences and their significance for personal and professional development.
Recommended literature	<p>Bierhoff, H.-W., & Rohmann, E. (2020). Soziale Verantwortung im Organisationskontext. In A. Seibert-Fohr (Hrsg.), Springer VS.</p> <p>Hochschulrecht - Satzungen und Verordnungen der THD (zu finden auf der Webseite der THD: https://th-deg.de/de/studierende/antraege-und-organisatorisches#hochschulrecht)</p> <p>Genenger-Stricker, M. (Hrsg.). (2019). Hochschule und soziale Heterogenität: Anforderungen und Impulse für eine diversitätssensible und -gerechte Hochschulentwicklung. Springer VS.</p> <p>Hans-Böckler-Stiftung. (2009). Hochschule in gesellschaftlicher Verantwortung: Unser Vorschlag für das Leitbild Demokratische und Soziale Hochschule. Hans-Böckler-Stiftung.</p> <p>Springer, C., & Struß, B. (2018). Hochschule mit Verantwortung: Engagementförderung durch universitäre Lehre. Newsletter des Bundesnetzwerks Bürgerschaftliches Engagement (BBE), Nr. 15, 26. Juli 2018.</p>
Teaching methods	Projects, group work, active involvement

Assessment method	Written assignment (German or English)
Language of instruction	English
Prerequisites	For further information, please get in contact with the International Office.

Simplified Microcontroller Programming

Course title	Simplified Microcontroller Programming
ECTS	2
Course type	Lecture with practical exercises
SWS	2
Semester	Winter and summer
Workload in hours	Total: 60 / In-class: 30 / Self-study: 30
Lecturer	Johann Gerner

Course objectives

In almost all areas of technical installations, microcontrollers constitute the core of control and regulating engineering. By means of various university initiatives, systems have been developed that are both inexpensive and easy to program and therefore they are especially suitable for students who do not have an extensive basic knowledge in the field of electrical engineering. Based on the simple development system “Arduino”, students will learn how can be solved technical problems in the various engineering disciplines with the aid of software and hardware. Here, the handling of hardware-based programming is exercised and solution approaches are developed that are presented in the various sensors and actuators.

- Course contents
- **Introduction: presentation of the development system Arduino and its sub-systems**
 - **Testing and analysis of existing sample programs under consideration of special problem cases**
 - **Reading and implementing Fritzing diagrams and wiring diagrams**

	<ul style="list-style-type: none">• Inclusion and application of external program libraries• Application programming of different sensors and their characteristics• Control of different actuators and introduction to the applied technology• Program development for simple measurement and control applications• Information about current development trends in microcontroller engineering
Recommended literature	Massimo Banzi, Arduino für Einsteiger (2012); O'Reilly Simon Monk, Programming Arduino Next Steps: Going Further with Sketches
Teaching methods	Seminar-like lessons and practical tasks in the laboratory
Assessment method	Paper
Language of instruction	English
Prerequisites	Fundamentals of Informatics, experience with Windows

Advanced Circuits Lab

Course title	Advanced Circuits Lab
ECTS	5
Course type	Practical Exercises
SWS	4
Semester	Winter and summer
Workload in hours	Total: 150 / In-class: 60 / Self-study: 90
Lecturer	Michael Benisch
Course objectives	Ability to analyze and apply analog semiconductor circuits. Ability to design simple analog semiconductor circuits.
Course contents	<ul style="list-style-type: none">• Lessons for introduction of specific topics<ul style="list-style-type: none">- Applications of analog circuits- Diodes and Transistors- Amplifiers- RF circuits (Oscillators, PLL)• Lab Experiments<ul style="list-style-type: none">- Introduction to basic electronics measurement equipment- Diode circuits: voltage doubler (Villard and Greinacher circuit), voltage cascade, diode as switch- Integrated circuits: Timer circuit- Design of AF-amplifier according to specification- Differential amplifier: Characteristics, current source, application

	<ul style="list-style-type: none">- Quasi-linear AF-power-amplifier: Class A, B, AB operation, biasing, output power, efficiency- Switch mode AF power amplifier: Class D- Phase locked loop - PLL- RF-Oscillators: Phase-shift oscillator, Wien-bridge oscillator, Colpitts-oscillator, LC-oscillators, Franklin-oscillator- Nonlinear RF-circuit simulation using AWR Microwave office- RF-measurements: S-Parameter and time domain reflectometry
Recommended literature	Tietze, Schenk: Electronic Circuits: Handbook for Design and Application, Springer 2nd ed. 2008
Teaching methods	Practical work and some lessons for introduction of specific topics
Assessment method	Written examination (90 min.) and project
Language of instruction	English
Prerequisites	Basic knowledge of solid-state devices (bipolar junction transistors, diodes) Basics of electronic networks

Advanced Modelling and Simulation

Course title	Advanced Modelling and Simulation
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ECTS	5
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Course type	Seminar
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SWS	4
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Semester	Summer
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Workload in hours	Attendance: 60 / Self-study: 90 / Total: 150
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Lecturer	Prof. Dr. Mathias Hartmann
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Course objectives	<p>The content of "Advanced Modelling and Simulation" enables students to select and design models of technical systems and processes for different applications.</p> <p>The technical and methodological skills described below are taught for this purpose.</p> <p>After completing the Advanced Modelling and Simulation module, students will be able to</p> <ul style="list-style-type: none">• model technical systems using simple balancing approaches• select the required methods from the methods learned for experimental modelling and incorporate them into a modelling process• apply methods for the experimental generation of models of dynamic systems, state machines and machine learning and analyse the model results in a targeted manner• assign and use the generated models to simulation tools in a suitable manner <p>In the module Advanced Modelling and Simulation, the following competences are to be taught:</p>
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Professional competence:

- Understanding and applying methods of experimental modelling of dynamic systems
- Consolidation (synthesis) of the model-building methods to complex overall models
- Understanding and applying methods of machine learning, especially artificial neural networks in the modelling process
- Understanding different approaches to the design of simulation systems

Methodological competence:

- Application of state machines for the modelling of technical systems
- Verification (evaluation) of modelling results
- Application of generated models in suitable simulation systems
- Assessment of the suitability of models for the phases of a product development process.

Personal competence:

- Solution of complex modelling and simulation tasks

Social competence:

- The students are able to look at the problems from different perspectives and to use their competences acquired in the module situation appropriately in individual and group discussions.

Course contents

The digital transformation of industrial processes relies heavily on the availability of suitable models. These models are used in virtual product development, in the digitalization of plant operation and maintenance, but also in the virtual description of processes, e.g. in control systems or material flows. The focus of this course is therefore on the modelling of technical systems as a basis for system simulation.

Learning contents:

I) Mathematical Models of Physical Systems

- Differential Equations of Physical Systems
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	<ul style="list-style-type: none"> • Linear Approximation of Non Linear System Equations • Block diagrams • State Space Models of Linear Systems • Discrete Time Systems
	<p>II Modeling of physical systems in the time domain</p> <ul style="list-style-type: none"> • Mechanical systems • Electrical systems • Electro-Mechanical systems • Lagrange formalism
	<p>III Parameter Estimation</p> <ul style="list-style-type: none"> • The Steepest Descend Method • Quasi Newton approaches
Recommended literature	<ul style="list-style-type: none"> • Robert L. Woods, Kent L. Lawrence: Modeling and Simulation of Dynamic Systems. Prentice Hall, 1997 • Isermann R.: Identification of dynamic systems. Springer-Verlag, 2011. • Ljung L., Glad T.: Modeling of dynamic systems. Prentice Hall, 1994 • Ake Björck, Germund Dahlquist. Numerical methods. Dover Publications. 1974
Teaching methods	<p>Teaching lessons, practical exercises (modelling, simulation, control design, testing),</p> <p>individual and group work</p>
Assessment method	Written examination (90 min)
Language of instruction	English

Formal: None

Prerequisite

Essential thematic prerequisites: Mathematical modelling of linear time-invariant systems, physical basics and modelling approaches for mechanical and electrical systems, analogous and digital control design, advanced knowledge of programming language C.

Python Programming: Basics and Applications

Course title	Python Programming: Basics and Applications
ECTS	2
Course type	Programming sessions and semester project
SWS	2
Semester	Summer
Workload in hours	Total: 60 / In-class: 30 / Self-study: 30
Lecturer	Prof. Dr.-Ing. Giuseppe Bonfigli
Course objectives	<p>After attending this course, students will be able to implement small Python programs for everyday applications in engineering. They will know the fundamentals of the syntax and of the logical structures of Python, including rudimentary elements of Object-Oriented Programming, and will be able to apply them to solve programming tasks. They will be aware of the flexibility of Python, and of the wide range of capabilities provided by additional libraries (modules). Depending on the requirement of the semester project, they may achieve deeper insight into single modules of choice.</p>
Course contents	<ul style="list-style-type: none"> • Built in data types: int, float, strings, tuples, lists, dictionaries • Loops and flow control structures • Input/Output statements • Classes and elements of object-oriented programming • Most common modules: numerical (math, numpy, scipy), graphical (matplotlib), system interface (os), gui management (tkinter) • Other modules, depending on the specific requirements of the semester project

Recommended literature	<ul style="list-style-type: none"> • Schell, Scott: Introduction to Python for scientific computing, https://sites.engineering.ucsb.edu/~shell/che210d/python.pdf • Milliken, Connor: Python projects for beginners, https://link.springer.com/book/10.1007%2F978-1-4842-5355-7 • Romano, Fabrizio: Learn Python Programming, https://ebookcentral.proquest.com/lib/th-deggendorf/detail.action?docID=5446038 • Schell, Scott: Introduction to Numpy and Scipy, https://sites.engineering.ucsb.edu/~shell/che210d/numpy.pdf
Teaching methods	<p>This course focuses on the practical side of programming and relies on a hands-on approach. Syntactical basics and logical structures will be introduced according to the reference literature. They will be exemplified during the lecture by solving targeted programming tasks. Programming competence will be further trained within regular exercises and in the scope of the semester project. The latter consists of a programming task of moderate to intermediate complexity on a topic of free choice. It might foresee the usage of additional libraries (modules), if convenient for the specific application.</p>
Assessment method	Semester project and presentation of the results
Language of instruction	English
Prerequisite	None

Engineering Mechanics 3: Dynamics

Course title	Engineering Mechanics 3: Dynamics
ECTS	5
Course type	Lectures with Tutorials
SWS	4
Semester	Summer
Workload in hours	Total: 120 / In-class: 60 / Self-study: 60
Lecturer	Prof. Dr. Christian Bongmba
Course objectives	<p>The main aims of the course are:</p> <p>For the students to understand the effect of forces and moments on the motion of mechanical systems.</p> <p>For them to be able to mathematically describe the motion of a particle and a rigid body in an inertial as well as in a moving frame.</p> <p>For the students to have a good understanding of the laws and principles of dynamics (Newton's second law, Newton-Euler equations, d'Alembert's principle, work-energy theorem) and to be able to formulate these laws mathematically.</p> <p>For them to be able to derive the equations of motion of a particle or a rigid body using the laws and principles of dynamics.</p> <p>For the students to understand how to create mechanical models of technical systems and to use dynamics in solving problems related to these technical systems.</p>

Course contents	Kinematics of a Particle
	Laws of Dynamics
	Dynamics of a Particle
	Relative Motion
	General Motion of a Rigid Body
	Rigid Bodies in Plane Motion
	Elementary Impact Dynamics
	Mechanical Vibrations

Recommended literature	Dietmar Gross, Werner Hauger, Jörg Schröder, Wolfgang Wall, Sanjay Govindjee: Engineering Mechanics 3, Dynamics. Springer, 2011, ISBN: 9783642140198 Hibbeler, Russell C: Engineering Mechanics: Dynamics. 12th ed. Prentice Hall, 2009. ISBN: 9780136077916.
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Teaching methods	Lectures and Tutorials
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Assessment method	Written examination, 90 min.
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Language of instruction	English
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Prerequisite	Calculus
	Statics Mathematics

Chemistry

Course title	Chemistry
ECTS	4
Course type	Lecture
SWS	4
Semester	Winter
Workload in hours	Total: 150 / In-class: 60 / Self-study: 90
Lecturer	Prof. Dr. Jeff Wilkesmann

On successful completion of this module, students should

- **know the basic concepts and terms of general chemistry** (Knowledge)
 - **understand the language of chemistry** (symbols, formula, equations, solution, concentrations). (Knowledge)
 - **be able to sketch basic inorganic reactions** (Comprehension)
- Course objectives
- **integrate know-how** with importance and application of chemistry for every day's life (skills)
 - **Ability to understand chemical problems and translate them** into equations and apply the principles of chemistry to solve the problems (skills)
 - **Understand possible material-dependent challenges** that arise in product and process development (competences)
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	<ul style="list-style-type: none">• develop social skills to communicate with peers about a complex topic and find a common solving-oriented approach (competences)
Course contents	atomic structure: atoms, elements and compounds, atomic models; periodic table of elements.; chemical bond: covalent, ionic, metal; definition of the chemical equilibrium; acid and base chemistry: pH-values, strong and weak acids and bases, neutralization, calculation of buffer solutions; redox reactions: definition of oxidation und reduction, making-up redox reactions, corrosion processes; electrochemistry: standard reduction potentials, electrolysis, electrolytic cells. Chemical reactions, reaction kinetics. Principles of organic chemistry.
Recommended literature	Petrucci's General Chemistry: Principles and Modern Applications; (2023) ISBN: 978-1-292-45786-4 Robert C. Fay, John E. McMurry, Jill Kirsten Robinson Atoms First Chemistry, Global Edition (2020) ISBN: 978-1-292-33626-8 Brown, Chemistry: The Central Science (2017)
Teaching methods	Lectures / Course teaching / exercises /tutorials / experimental demonstrations
Assessment method	Written examination, 90 min.
Language of instruction	English
Prerequisites	None

Computation in C

Course Title	Computation in C
ECTS	5
Course type	Lecture
SWS	4
Semester	Summer
Workload in hours	150
Name of lecturer	Prof. Dr. Thomas Stirner
Course objectives	Knowledge of basic software-engineering methods; ability to use an integrated software development environment; ability to use the programming language C; basic understanding of the precompile; ability to implement algorithms in the programming language C
Course contents	Software-engineering methods; computer architecture; precompile; data types; declarations; arithmetic, relational and logic operators; decisions; loops; functions; pointers; arrays; structures; dynamic memory allocation
Recommended literature	Kernighan and Ritchie, The C programming language, Prentice Hall
Teaching methods	Lectures, exercises
Assessment method	Written examination (60 min)

Language of instruction	English
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Prerequisite	None
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Relativity

Course title	Relativity
ECTS	5
Course type	Lecture
SWS	4
Semester	Summer
Workload in hours	150
Name of lecturer	Prof. Dr. Thomas Stirner
Course objectives	Knowledge of Albert Einstein's theory of special relativity; applications arising from the theory of relativity; experimental observations; solution of exercises; logical thinking; problem-solving skills
Course content	Introduction to space-time; length contraction and time dilation; relativistic dynamics; mass-energy equivalence; paradoxes; basics of general relativity and cosmology
Recommended literature	Gabriel Barton, Introduction to the relativity principle, Wiley, 1999
Teaching methods	Lectures with exercises
Assessment method	Written examination 60 min.

Language of Instruction	English
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Prerequisites	None
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Projects in Science and Engineering

Course title	Projects in Science and Engineering
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ECTS	6
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Course type	Project
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SWS	4
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Semester	Winter and summer
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Workload in hours	180
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Lecturer	Prof. Dr. Thomas Stirner
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Course objectives	Knowledge of project management; analysis, distribution and solution of the tasks in a small team; obtaining and presenting results; practical application of the theoretical knowledge base; communication and team skills; strategic planning; time-management skills; problem-solving skills
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Course contents	Projects or part of a project may be of a theoretical nature (e.g. literature review, software development, data mining, etc.) or of an experimental nature (e.g. design of experiment, measurements, etc); project descriptions will be made available at the beginning of the semester; teams will be built to solve the tasks; each team will work on project results, which will be presented in written form and orally
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Recommended literature	Specific to the project
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Teaching methods	Supervision
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Assessment method	Written report and oral presentation
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Language of Instruction	English
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Prerequisites	None
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Advanced Projects in Science and Engineering

Course title	Advanced Projects in Science and Engineering
ECTS	6
Course type	Project
SWS	4
Semester	Winter and summer
Workload in hours	180
Lecturer	Prof. Dr. Thomas Stirner
Course objectives	Deeper knowledge of project management; further analysis, distribution and solution of advanced tasks in a small team; obtaining and presenting results; extensive practical application of the theoretical knowledge base; enhanced communication and team skills; strategic planning; time-management skills; problem-solving skills
Course contents	Advanced projects or part of an advanced project may be of a theoretical nature (e.g. literature review, software development, data mining, etc.) or of an experimental nature (e.g. design of experiment, measurements, etc.); project descriptions will be made available at the beginning of the semester; teams will be built to solve the advanced tasks; each team will work on project results, which will be presented in written form and orally
Recommended literature	Specific to the project

Teaching methods

Supervision

Assessment method

Written report and oral presentation

Language of
Instruction

English

Prerequisites

Projects in Science and Engineering

Projects in Industrial Engineering

Course title	Projects in Industrial Engineering
ECTS	6
Course type	Project
SWS	4
Semester	Winter and summer
Workload in hours	180
Lecturer	Prof. Dr. Jutta Stirner
Course objectives	Knowledge of project management; analysis, distribution and solution of the tasks in a small team; obtaining and presenting results; practical application of the theoretical knowledge base; communication and team skills; strategic planning; time-management skills; problem-solving skills.
Course contents	Projects or part of a project may be of a theoretical nature (e.g. literature review, data mining, etc.) or of analytical nature (e.g. business plan, etc.); project descriptions will be made available at the beginning of the semester; teams will be built to solve the tasks; each team will work on project results, which will be presented in written form.
Recommended literature	Specific to the project

Teaching methods	Supervision
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Assessment method	Written report
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Language of instruction	English
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Prerequisites	None
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Miscellaneous	Max. 10 participants
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Advanced Projects in Industrial Engineering

Course title	Advanced Projects in Industrial Engineering
ECTS	6
Course type	Project
SWS	4
Semester	Winter and summer
Workload in hours	180
Name of lecturer	Prof. Dr. Jutta Stirner
Course objectives	Deeper knowledge of project management; further analysis, distribution and solution of advanced tasks in a small team; obtaining and presenting results; extensive practical application of the theoretical knowledge base; enhanced communication and team skills; strategic planning; time-management skills; problem-solving skills
Course content	Advanced projects or part of an advanced project may be of a theoretical nature (e.g. literature review, data mining, etc.) or of a statistical nature (e.g. data analysis etc.); project descriptions will be made available at the beginning of the semester; teams will be built to solve the advanced tasks; each team will work on project results, which will be presented in written form.
Recommended literature	Specific to the project: Google Scholar, Science Direct via THD library

Teaching methods	Supervision
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Assessment method	Written report
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Language of Instruction	English
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Prerequisites	Projects in Industrial Engineering
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Communication and Presentation Techniques and Scientific Writing

Course title	Communication and Presentation Techniques and Scientific Writing
ECTS	4
Course type	Lecture
SWS	4
Semester	Summer
Workload in hours	Time of attendance: 30 hours self-study: 30 hours Total: 60 hours
Lecturer	Prof. Dr. Adrian von Düring
Course objectives	The main goal is to improve students listening, speaking and presentation skills through theory, observation, practice and group feedback. They also learn to argue in debating sessions. Besides this they will develop the skills that are necessary to prepare presentations, to speak with confidence and to plan and use visual aids effectively. Students learn what communication is, how culture, language choices and non-verbal clues affect the image presented, how to organize a message, how to make persuasive presentations. Students also learn how to be effective listeners and give qualified feedback.
Course contents	The course covers communication and feedback, body language, organizing thoughts and data, voice, non-verbals and audience interaction and visual aids. Students are expected to incorporate the following themes into their presentations: <ul style="list-style-type: none"> - Basics of successful presentations - How to use visual aids including PowerPoint

	<ul style="list-style-type: none"> - How to avoid over-presenting with PowerPoint and other media - The logistics of presenting - What to do when things go wrong <p>Students will develop and improve these skills during debates:</p> <ul style="list-style-type: none"> - What constitutes effective leadership behavior? - How to give and receive feedback in a debate? - What are some obstacles to effective communication and how these can be overcome? - What does a presenter need to know about nonverbal communication? - When is assertive behavior appropriate in communicating? - What are the elements of persuasive presentations? - What are effective response styles? - How to argue convincingly? - How can a verbal confrontation produce its intended result? - What are effective ways to organize a message?
Recommended literature	<p>The Presenter's Fieldbook: A Practical Guide (Christopher-Gordon New Editions) Third Edition, 2018 by Robert J. Garmston</p> <p>The Exceptional Presenter: A Proven Formula to Open Up and Own the Room by Timothy J. Koegel</p>
Teaching methods	<p>The course is conducted like a professional workshop. Students begin by making short presentations on a variety of theoretical and practical topics related to oral presentations and communication techniques. After individual feedback and coaching and discussion rounds with peers, students then evaluate a professional presentation and develop guidelines for improving their own subsequent presentations.</p> <p>Students also participate in a workshop to learn the principles of debating techniques. Students get the opportunity to practice in a small group forum.</p>
Assessment method	portfolio
Language of instruction	English

Prerequisites	None
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Global Leadership

Course title	Global Leadership
ECTS	5
Course type	Lecture
SWS	4
Semester	Summer
Workload in hours	Total: 150 / In-class: 60 / Self-study: 90
Lecturer	Matthias Koeppen

Course objectives	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none">1. Understand the key concepts, theories, and models of Leadership and Global Leadership in particular.2. Analyze the impact of cultural, social, and economic differences on leadership practices.3. Develop strategies for effective communication and collaboration in multicultural teams.4. Apply ethical decision-making frameworks to address global challenges.5. Demonstrate adaptability, resilience, and emotional intelligence in leadership roles.6. Reflect on their own leadership style and identify areas for growth in a global context.
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Course contents	<p>The "Global Leadership" course is designed to equip students with the essential knowledge, skills, and competencies required to lead effectively in a globalized and interconnected world. The course explores the challenges and opportunities of leading diverse teams, managing cross-cultural dynamics, and</p>
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navigating complex global environments. Through a combination of theoretical frameworks, case

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studies, and practical exercises, students will develop a deep understanding of what it means to be a global leader in the 21st century.

1. Introduction to Global Leadership:

- Defining global leadership
- The role of globalization in shaping leadership practices
- Key competencies of global leaders

2. Cultural Intelligence and Cross-Cultural Communication:

- Understanding cultural dimensions (e.g., Hofstede, Trompenaars)
- Overcoming cultural barriers in communication
- Building trust and rapport across cultures
- Country Cluster specific examples (Northern Asia - CN, JAP, North America - USA, Europe - DACH, Scandinavia, Eastern Europe)

3. Leading Diverse and Virtual Teams:

- Strategies for managing geographically dispersed teams
- How to behave in global business meetings, business practices and standards - What To-Do and NO-GOs

4. Ethical Leadership and Social Responsibility:

- Ethical dilemmas in global leadership
- Corporate social responsibility (CSR) and sustainability
- Balancing profit and purpose in a global economy

5. Global Leadership in Practice:

- Case studies of successful global leaders
 - Developing a personal leadership action plan
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Recommended literature	<p>Perruci, G. (2022). The Study and Practice of Global Leadership. Emerald Publishing</p> <p>Chirino-Klevans, I. (2020). Cases on global leadership in the contemporary economy. IGI Global: Hershey</p> <p>Daft, R. L. (2010). Understanding the theory and design of organizations. South-Western Cengage Learning: Mason</p> <p>Sriramesh, K., Verčič, D. (2020) The global public relations handbook : theory, research, and practice. New York: Routledge</p> <p>Hollensen, S. (2019) Global Marketing. London: Pearson Education</p>
Teaching methods	<ul style="list-style-type: none">• Interactive lectures and discussions• Group work and case study analysis• Role-playing and simulations• Guest lectures• Reflective journaling and self-assessment exercises
Assessment method	30 % group work and 70 % assignment paper
Language of instruction	English
Prerequisites	None
