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## German A1/ Parts 3 and 4

<b>Course title</b>	German A1/ Parts 3 and 4
<b>ECTS</b>	4
<b>Course type</b>	Course with exercises
<b>SWS</b>	4
<b>Semester</b>	Winter and Summer
<b>Workload in hours</b>	60 hrs
<b>Lecturer</b>	Dr. Virginia Wallner
<b>Course objectives</b>	<ul style="list-style-type: none"> <li>• Can understand and use familiar expressions and very basic phrases aimed at meeting concrete everyday needs</li> <li>• Can introduce themselves and others and ask other people questions about their person</li> <li>• Can communicate in a simple way if the other person speaks slowly and clearly and is willing to help</li> </ul> <p><a href="http://www.europaeischer-referenzrahmen.de">http://www.europaeischer-referenzrahmen.de</a></p>
<b>Course contents</b>	<ul style="list-style-type: none"> <li>• Grammar           <ul style="list-style-type: none"> <li>– Prepositions</li> <li>– Possessives</li> <li>– Dative verbs</li> <li>– The imperative-Simple past 'war/ hatte'</li> <li>– The perfect form</li> <li>– Word formation</li> <li>– Subjunctive II</li> </ul> </li> <li>• Topics           <ul style="list-style-type: none"> <li>– Apartments and houses</li> <li>– Parts of the body</li> <li>– Describing people and their character</li> <li>– Household activities</li> <li>– Weather</li> <li>– Holidays and celebrations</li> </ul> </li> </ul>

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<b>Recommended literature</b>	<p>Menschen. Deutsch als Fremdsprache. Kursbuch A1.2 Hueber. Kapitel 13-24 ISBN 978-3-19-561901-1</p> <p>Menschen. Deutsch als Fremdsprache. Arbeitsbuch A1.2 mit Audio-CD. Hueber. Kapitel 13-24 ISBN 978-3-19-511901-6</p>
<b>Teaching methods</b>	<ul style="list-style-type: none"> <li>• Partner and group work</li> <li>• Explanation of topics by the lecturer</li> <li>• Presentations and discussions</li> <li>• Feedback from the lecturer</li> <li>• Listening exercises</li> </ul>
<b>Assessment method</b>	Written examination, 90 min.
<b>Language of instruction</b>	German
<b>Prerequisites</b>	Successful completion of Level A1/Parts 1 and 2 (88121)

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Course descriptions for German language courses at higher levels:  
<https://th-deg.de/en/students/language-electives#german>

## English in Technical Contexts B2

<b>Course title</b>	English in Technical Contexts B2
<b>ECTS</b>	2
<b>Course type</b>	Language training course
<b>SWS</b>	2
<b>Semester</b>	Winter and summer
<b>Course level</b>	<p><b>B2</b></p> <ul style="list-style-type: none"> <li>• Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialization</li> <li>• Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party</li> <li>• 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</li> </ul> <p><a href="http://www.europaeischer-referenzrahmen.de/">http://www.europaeischer-referenzrahmen.de/</a></p>
<b>Lecturer</b>	Neal O'Donoghue, MA
<b>Course objectives</b>	<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 comprehensive understanding of, and enhanced fluency in, the English language in an engineering context.</p>

<b>Course contents</b>	<p><i>Obligatory topics (60 %):</i></p> <ul style="list-style-type: none"> <li>• Numbers and mathematical operations</li> <li>• Shapes and dimensions</li> <li>• August 2017</li> <li>• Basic physics and the scientific worldview</li> <li>• Materials and their properties</li> <li>• Case study on an area related to technology</li> <li>• /physics/engineering</li> <li>• Grammar/ communication skills</li> </ul> <p><i>Variable content (40 %):</i>                  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.</p>
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<b>Teaching methods</b>	<p>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.</p> <p>Work not completed in class should be done at home. Self-study assignments will be set on a weekly basis.</p>
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<b>Assessment method</b>	<p>Written exam (60 min)</p> <p>No dictionaries are allowed.</p> <p>Exam structure:</p> <ul style="list-style-type: none"> <li>• Part 1: Listening comprehension(s)</li> <li>• Part 2: Reading comprehension(s)</li> <li>• Part 3: Vocabulary and technical content</li> <li>• Part 4: Grammar (maximum 10% of total exam points, excluding writing exercise)</li> <li>• Part 5: Writing composition (150-200 words)</li> </ul> <p>The exam will be based on topics covered during the semester.</p>
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<b>Recommended Literature</b>	<p>Astley, Peter, and Lewis Lansford. <i>Engineering 1: Student's Book</i>. Oxford: Oxford UP, 2013. Print.</p> <p>Bauer, Hans-Jürgen. <i>English for Technical Purposes</i>. Berlin: Cornelsen, 2000. Print.</p>
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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.

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

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

engine: Englisch für Ingenieure. <[www.engine-magazin.de](http://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.

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	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.
<b>Language of instruction</b>	English
<b>Prerequisites</b>	B1 / Abitur (A-levels/ school leaving certificate giving right of entry to higher education) / 7-9 years of English

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## Intercultural Training for Germany and Bavaria

<b>Course title</b>	Intercultural Training for Germany and Bavaria
<b>ECTS</b>	1
<b>Course type</b>	Elective
<b>SWS</b>	1
<b>Semester</b>	Winter and summer
<b>Workload in hours</b>	30 hours
<b>Name of Instructor</b>	Lisa Werner
<b>Course objectives</b>	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.
<b>Course contents</b>	<ul style="list-style-type: none"> <li>I. Culture (theroies)</li> <li>II. Customs and Rituals in Germany/Bavaria</li> <li>III. Information on Germany and Bavaria and the DIT</li> <li>IV. Quiz and Presentation</li> <li>V. Culture Shock</li> </ul>
<b>Recommended literature</b>	<p>Bolten J. und Ehrhardt C., Interkulturelle Kommunikation, Verlag Wissenschaft &amp; Praxis 2003;          Bolten J, Einführung in die interkulturelle Wirtschaftskommunikation, Vandenhoeck &amp; Ruprecht 2007</p>
<b>Teaching methods</b>	<p>The course is organized according to four pillars:</p> <ul style="list-style-type: none"> <li>1. Culture</li> <li>2. Customs and Rituals</li> <li>3. Information on Germany/Bavaria</li> </ul>



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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.

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**Assessment method** Paper

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**Language of instruction** English/German

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**Prerequisites** None

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## Basics of International Sales and Business Development

<b>Course title</b>	Basics of International Sales and Business Development
<b>Course ID</b>	268
<b>ECTS</b>	2
<b>Course type</b>	Lecture with group work and presentations
<b>SWS</b>	2
<b>Semester</b>	Winter and summer
<b>Lecturer</b>	Ibrahim Waked
<b>Course objectives</b>	General knowledge of international sales and strategic business development mechanisms. As well as profound analysis of practical case studies.
<b>Course contents</b>	<ul style="list-style-type: none"> <li>• Basics of sales and business development</li> <li>• Analysis of market potential including cultural &amp; political aspects, correlation between microeconomic and demographic aspects, (PESTELO analysis)</li> <li>• Relevancy of world bank reports on general economic performance and their implementation in company BD strategy</li> <li>• Market entry and risk management</li> </ul>
<b>Recommended literature</b>	<p><b>Strategic Management</b> by Richard Lynch von Pearson Longman</p> <p><b>Business Development Management</b> By Lutz Becker, Walter Gora, Tino Michalski</p>
<b>Teaching methods</b>	Lecture with integrated project development examples
<b>Assessment method</b>	Presentation and seminar paper
<b>Language of instruction</b>	English

## Bavarian Culture

<b>Course title</b>	Bavarian Culture
<b>Course ID</b>	229
<b>SWS</b>	2
<b>Semester</b>	Winter and summer
<b>ECTS</b>	2
<b>Course type</b>	Elective
<b>Language of instruction</b>	English
<b>Name of lecturer</b>	Jennifer Hauer
<b>Course objectives</b>	Participants get a deeper understanding of the traditional and contemporary Bavarian culture by integrating knowledge about customs, language, and history with culturally routed events.
<b>Course contents</b>	<ol style="list-style-type: none"> <li>1. Hard facts           <ol style="list-style-type: none"> <li>1.1. History</li> <li>1.2. Demographics</li> <li>1.3. Geography</li> </ol> </li> <li>2. Customs and rituals           <ol style="list-style-type: none"> <li>2.1. Traditional</li> <li>2.2. Contemporary</li> </ol> </li> <li>3. Language</li> <li>4. Events</li> </ol>
<b>Teaching methods</b>	<p>The course is organized according to four pillars:</p> <ol style="list-style-type: none"> <li>1. Hard Facts</li> <li>2. Customs and Rituals</li> <li>3. Language</li> <li>4. Events</li> </ol> <p>Whereas hard facts are taught in a classical lecture style, students should experience aspects of the culture in a lively manner through knowledge dissemination of cultural experts, off-campus seminars at events of traditional cultural</p>

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origin, as well as learning and engaging in cultural rituals themselves. The aim is to deepen and complement the contents taught in the Orientation Week.

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**Recommended literature**

Jonas, B., Gebrauchsanweisung für Bayern, Piper Verlag, 2007

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**Assessment methods**

Seminar paper

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**Prerequisites**

Participants should have attended the introductory Intercultural Training during the Orientation Week.

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## Business Storytelling

<b>Course title</b>	Business Storytelling
<b>Course ID</b>	296
<b>ECTS</b>	2
<b>Course type</b>	Elective
<b>SWS</b>	2
<b>Semester</b>	Winter and summer
<b>Workload in hours</b>	Total: 60 / In-class: 30 / Self-study: 30
<b>Lecturers</b>	Diego and Raphael Fiche
<b>Course objectives</b>	<p>At the end of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Recognize key elements that go into persuasive storytelling</li> <li>• Identify types of stories and their purposes</li> <li>• Create compelling stories to achieve business goals</li> <li>• Apply acquired knowledge to develop a compelling story to persuade others to think or act in a different way.</li> </ul>
<b>Course contents</b>	<ul style="list-style-type: none"> <li>• Introduction to Business Storytelling</li> <li>• Power of Business Stories: when and why to tell them</li> <li>• Types of Business Stories and Their Purposes</li> <li>• Structuring Your Story to Engage the Audience</li> <li>• Storytelling techniques</li> <li>• Enhance Your Storytelling Skills</li> </ul>
<b>Recommended literature</b>	<p>Janis Forman (2013), <i>Storytelling in Business: The Authentic and Fluent Organization</i></p> <p>Seth Godin(2005), <i>All Marketers Are Liars</i></p>

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<b>Teaching methods</b>	<ul style="list-style-type: none"><li>• Lectures</li><li>• Group work</li><li>• Case studies</li><li>• Presentation</li><li>• Exercises</li></ul>
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<b>Assessment method</b>	Class workshops / presentation / case studies / seminar paper
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<b>Language of instruction</b>	English
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<b>Prerequisites</b>	None
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## Cross-Cultural Team Building

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<b>Course title</b>	Cross-Cultural Team Building Workshop
<b>Lecturer</b>	Prof. Dr. Johann Nagengast
<b>Course type</b>	Elective
<b>SWS</b>	2
<b>Semester</b>	Winter and summer
<b>ECTS</b>	2
<b>Assessment method</b>	Seminar paper
<b>Course language</b>	English

### Course objectives

Globalisation demands that managers possess the basic skills required to work together in international teams. Many companies actively encourage the development of these skills through teambuilding or team development programs. Especially for change management, team development plays an increasingly important role. Here the critical goal is to optimise how the group members work together as a team. Key factors affecting a team's success include organisation, structures, processes, culture and relationships.

International Team Building is conducted at the beginning of the semester as a three day off-campus seminar. The hands-on, outdoor training gives the students intensive exposure to the multifaceted nature of group dynamics.

By working together to solve complex problems and through structured feedback sessions, the participants become sensitised to the rolls they assume in group interactions, to the limitations imposed by the German and their own cultures, and to the conditions required for effective team work.

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The course supports the integration of foreign students into campus and social life and helps build lasting working relationships among all participants.

The skills of giving and receiving of feedback are learned in the protective atmosphere of small groups through intensive exchanges between instructors and participants. This leads to improved observation and communication skills.

Moreover, the group members continually switch roles. This promotes a deeper understanding of social interaction, helps members to reflect on their contribution to the group process, encourages members to experiment with new behavioural concepts, and improves the group's capacity to co-operate and perform. Final feedback rounds offer the possibility to align the members' self-images with the perception others have of them, to reduce "blind spots", to increase self-confidence and their ability to reflect.

The capacity to give appropriate feedback in various situations, to monitor one's self image as well as the consequences of one's own behaviour form the basis for a successful career in management.

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### **Course contents**

Group dynamics, processes and structures in groups; Roles in groups (roles in tasks and supporting roles); Group leadership; Effect of one's actions in groups; The "give and take" of feedback; Self-image and how others see you; Communication levels (content versus relationship); Conditions for successful co-operation; Cultural influences on teamwork.

Note: The main emphasis of this course is not the conveyance of theoretical knowledge, but rather learning directly from experience. The theories on which the intervention and evaluation sessions are based are taught in the course "Human Resources Management".

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### **Teaching methods**

This course is organised as an interactive experience and activity-based training program. With the help of complex tasks, timed interaction activities combined with elements of surprise, classical outdoor training exercises, moderated feedback and reflection sessions, participants are taught the necessary conditions for effective teamwork.

The teaching methods are based on the principles of self-organised learning. The instructors define their roles in terms of Schein's model of process consulting.

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They intervene by questioning the participants in a manner designed not only to examine their perspectives, but to introduce new perspectives and stimulate the group's creative process.

The responsibility for these process remains with the participants.

In the context of the learning environment, the students enjoy the opportunity to increase their observation, communication, co-operation, self-reflection, teamwork and management skills as well as their self-confidence.

In addition, the course offers the students the chance to network and develop sustainable work relationships at the start of their studies.

**Suggested Literature**

Baron, R. S.: Group Process, Group Decision, Group Action, 2<sup>nd</sup>. Ed., Buckingham, 2003;

Buchanan, D., Huczynski, A.: Organizational Behavior, 5<sup>th</sup> Ed., Harlow, 2004;

Wagner, M., Waldmann, R.: Vom Outdoor-Training zur Teamentwicklung, Welchen Beitrag leisten Hochseilgärten? in: Jagenlauf, M./Michl, W. (Hrsg.) Erleben und Lernen – Internationale Zeitschrift für handlungsorientiertes Lernen, 1/2004

**Notes**

The weekend seminar is characterised by team teaching in a mountain hostel. The team consists of Prof. Dr. Nagengast and trained tutors selected from participants in the course „Train the Trainer“. The tutors make it possible to conduct the training in small „protected“ groups (around 8) and to give qualified feedback.

## EcoLab-News – News from Ecology and Economy

<b>Course title</b>	EcoLab-News – News from Ecology and Economy
<b>ECTS</b>	2
<b>Course type</b>	Elective
<b>SWS</b>	2
<b>Semester</b>	Summer
<b>Workload in hours</b>	Total: 60 / In-class: 30 / Self-study: 30
<b>Lecturer</b>	Prof. Dr. Robert Feicht
<b>Course objectives</b>	<p>Do you want to understand current climate policy issues and participate in sustainable development? The Fridays for Future movement has proven that properly set information will be heard. Together we will develop a kind of "information service" for the European Campus, which informs about the latest news, trends and movements in the field of sustainability and international politics. Methods expertise: In group work, various topics should be developed in a way that makes them easily understandable and communicable. Professional skills: Current knowledge in the field of sustainability and/or international politics. Social competence: Students work in groups. They learn the dynamics of team work and competences like systemic thinking, forward-thinking and acting, critical thinking, competence for fair and environmentally friendly action as well as competence in planning and implementing innovative projects.</p>
<b>Course contents</b>	<p>Development and implementation of an "information service" (newsletter, posts) in the field of sustainability and/or international politics. Preparation of current political topics, but also trends and developments in the field of sustainability for different target groups and different media.</p>

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<b>Teaching methods</b>	Group discussion and group work. Summary and presentation of the results.
<b>Assessment method</b>	seminar paper and presentation
<b>Language of instruction</b>	English
<b>Prerequisites</b>	None. Good writing skills and interest in current sustainable and/or political topics would be beneficial.

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## Database Engineering

<b>Course title</b>	Database Engineering
<b>ECTS</b>	5
<b>SWS</b>	4
<b>Semester</b>	Winter and summer
<b>Workload in hours</b>	In-class: 60 hrs. / Self-study: 90 hrs / Total: 150 hrs
<b>Lecturer</b>	Prof. Dr. Udo Garmann
<b>Course objectives</b>	<p>After this module students should</p> <ul style="list-style-type: none"> <li>• be able to describe the database design process,</li> <li>• know the elements of the Entity-Relationship-Model,</li> <li>• can build an Entity Relationship Model for a specific case,</li> <li>• can normalize a database design,</li> <li>• be able to manage a database through a database management system,</li> <li>• be able to query a database using SQL,</li> <li>• know the core components and functionalities of a database management system.</li> </ul>
<b>Recommended literature</b>	<p>Conolly, Thomas M.; Begg, Carolyn E.: Database Solutions - A step-by-step guide to building databases. 2nd Edition. Harlow, Essex: Pearson Education Limited, 2004</p> <p>Conolly, Thomas M.; Begg, Carolyn E.: Database systems - A practical approach to design, implementation, and management. 4th edition. Addison-Wesley, an imprint of Pearson Education, 2005</p>
<b>Teaching methods</b>	Classes with exercises and practical training Course and document management through E-Learning System iLearn

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<b>Assessment method</b>	Written examination, 90 min.
<b>Language of Instruction</b>	English
<b>Prerequisites</b>	Basics in Computer Science

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## Application Design

<b>Course title</b>	Application Design
<b>ECTS</b>	5
<b>Course type</b>	Lecture
<b>SWS</b>	4
<b>Semester</b>	Winter
<b>Workload in hours</b>	Total: 150 / In-class: 60 / Self-study: 90
<b>Lecturer</b>	Prof. Dr. Marcus Barkowsky
	<p>The module deepens knowledge in the field of architecture for media systems. It is based on the lectures basics of programming and design techniques into the media applications. Students should be able to know and apply the typical pattern for media applications.</p> <p>After completion of the module the students have achieved the following learning objectives:</p>
<b>Course objectives</b>	<ul style="list-style-type: none"> <li>• The students know typical issues in the design of media applications</li> <li>• They have designed and implemented applications that used this pattern and they know basic tools that help to minimize the amount of work</li> <li>• They know language-specific problem areas and know how to tackle them in the language.</li> </ul>
<b>Course contents</b>	<ul style="list-style-type: none"> <li>• Architectures</li> <li>• Streaming             <ul style="list-style-type: none"> <li>○ Problem</li> <li>○ Pattern</li> <li>○ Buffers and their realization</li> </ul> </li> <li>• Display Trees             <ul style="list-style-type: none"> <li>○ Problem</li> <li>○ Pattern</li> <li>○ Render trees and their realization</li> </ul> </li> </ul>

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- Parallelizing processes
    - Problem
    - Pattern
    - Event trigger processes
  - Application architecture
    - Problem
    - Model, View, Controller
    - Representation of sound
  - Platform independent programming
    - Problem
    - Adapter Pattern
    - Porting 3D graphics
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**Recommended literature**

Bjarne Stroustrup, "The C++ Programming language", ISBN-0-201-51459-1, 199

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**Teaching methods**

Lecture and internship

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**Assessment method**

Written examination, 90 min.

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**Language of instruction**

English

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**Prerequisites**

None

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## Mobile and Adaptive Human Machine Interfaces

<b>Course title</b>	Mobile and Adaptive Human Machine Interfaces
<b>ECTS</b>	2.5
<b>Course type</b>	Lecture
<b>SWS</b>	2 SWS
<b>Semester</b>	Winter and summer
<b>Workload in hours</b>	Total: 150 / In-class: 75 / Self-study: 75
<b>Lecturer</b>	Prof. Dr.-Ing. Marcus Barkowsky
<b>Course objectives</b>	<ul style="list-style-type: none"> <li>- Students can design, criticize, and implement mobile human-machine interfaces that meet the guidelines for usability, user experience, and experience quality.</li> <li>- Students understand the visual perception of people with regard to the development of efficient graphical user interfaces.</li> <li>- Students are able to follow the four phases of iterative UX design process including personas, scribbles, wireframes, and usability testing.</li> <li>- Students know how to implement their design with web technology, progressive web applications and native Android programming.</li> </ul>
<b>Course contents</b>	<p>Perception:</p> <ul style="list-style-type: none"> <li>- The human eye</li> <li>- Human visual perception</li> <li>- Higher cognitive processes</li> <li>- Gestalt Theory</li> </ul> <p>Human-Machine interaction concepts:</p> <ul style="list-style-type: none"> <li>- Cognitive background</li> <li>- Utility, Usability, User Experience</li> <li>- Quality of Experience</li> </ul> <p>Designing for User Experience:</p> <ul style="list-style-type: none"> <li>- 4 Steps of the design process</li> <li>- Specific considerations for design on mobile devices</li> <li>- Design principles for interactive Web applications using HTML, CSS, Javascript</li> </ul> <p>Exercise on User Experience Design:</p>



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	<ul style="list-style-type: none"> <li>- Designing a sample application</li> <li>- Refreshing HTML, CSS, Javascript</li> <li>- Frameworks for Mobile Application Development</li> <li>- Understanding Cordova and implementing the sample application</li> </ul> Native Application development with Android: <ul style="list-style-type: none"> <li>- Understanding the application life cycle</li> <li>- Tools of Android development</li> <li>- Guidelines for material design usage</li> <li>- Implementing a sample application</li> </ul>
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<b>Recommended Literature</b>	Bruce Goldstein, James Brockmole, "Sensation and Perception", 2016, 10th edition, Cengage Learning, ISBN: 978-1305580299 Pablo Perea, Pau Giner, "UX Design for Mobile", 2017, Packt Publishing, ISBN: 978-1-78728-342-8 Jens Jacobsen, Lorena Meyer, "Praxisbuch: Usability und UX", 2018, Rheinwerk Computing, ISBN: 978-3-8362-4423-7
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<b>Teaching methods</b>	Lecture / Exercises
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<b>Assessment method</b>	Written examination, 40 min. paper
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<b>Language of Instruction</b>	English
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<b>Prerequisites</b>	Basic Knowledge about Web-Technologies (HTML/CSS/JS) recommended
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## Informatics I

<b>Course title</b>	Informatics I
<b>ECTS</b>	5
<b>SWS</b>	4
<b>Semester</b>	Winter
<b>Workload in hours</b>	Total: 150 In-class: 60 / Self-study: 45 / virtual learning: 45
<b>Lecturer</b>	Prof. Dr. Gökçe Aydos

After successful accomplishment the students can:

### Professional competences

- summarize the challenges of biomedical text analysis
- list various scientific text resources and differentiate them
- outline the motivation behind ontologies for knowledge representation

### Methodological competences

- implement shell scripts for automating information retrieval, text processing, and semantics processing
- breakdown given shell scripts into various components, tweak it for further purposes, and localize errors
- apply XPath expressions to extract data from XML files
- evaluate a shell script regarding performance considerations and suggest improvements
- apply regular expressions on text to extract relevant information
- find correlations between concepts (e.g., does caffeine lead to malignant hyperthermia?)
- implement Python programs which can solve simple text processing and automation problems

### Course objectives

### Social competences

- give constructive feedback to peers in context of peer-assessed exercise

<b>Course contents</b>	<ul style="list-style-type: none"> <li>- data and text processing using the shell           <ul style="list-style-type: none"> <li>- biomedical text resources</li> <li>- semantics</li> <li>- data retrieval</li> <li>- data extraction</li> <li>- task repetition</li> <li>- XML processing</li> <li>- text retrieval</li> <li>- text processing</li> <li>- pattern matching</li> <li>- regular expressions</li> <li>- tokens &amp; entities &amp; relations</li> <li>- semantics processing</li> <li>- classes</li> <li>- entity linking</li> <li>- performance considerations</li> </ul> </li> <li>- programming with Python           <ul style="list-style-type: none"> <li>- control structures</li> <li>- data structures</li> <li>- objects &amp; algorithms</li> </ul> </li> </ul>
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<b>Recommended literature</b>	<ul style="list-style-type: none"> <li>- Couto, Data and Text Processing for Health and Life Sciences</li> <li>- Joyner, Introduction to Computing, 2016, ISBN: 1-260-08227-X</li> </ul>
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<b>Teaching methods</b>	Seminar-like classes, interactive exercises during lecture
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<b>Assessment method</b>	Written examination, 90 min.
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<b>Language of instruction</b>	English
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<b>Prerequisites</b>	Introduction to Informatics
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## Advanced Automation

<b>Course title</b>	Advanced Automation
<b>ECTS</b>	5
<b>SWS</b>	4
<b>Semester</b>	Winter
<b>Workload in hours</b>	Total: 150 / In-class: 60 / Self-study: 90
<b>Lecturer</b>	Prof. Dr. Terezia Toth

### Course objectives

In the subject Advanced Automation, students obtain an overview on how programmable logic controllers (PLCs) work, as well as basic hardware and software requirements.

They learn the standardized (IEC61131-3) and manufacturer-specific (TIA Portal) programming options. They learn how to use visualization software for the user interface.

The students acquire the basic competence to understand automated processes in the automotive industry, power plants, chemical industry, building technology and transportation. Thus, the students are able to shape the digital transformation of the industry.

#### Professional Skills

The students are familiar with the concepts and components of a modern automation system including the structure and functionality of industrial communication systems, also with regard to safety and security.

They are able to analyse, classify and solve simple tasks in automation technology.

The students know the requirements of hardware and software for a Programmable Logic Controller (PLC). They know the structure and the way a PLC operates. They are

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able create PLC programs. By using visualization software, they can demonstrate the processes.

### **Methodological Skills**

The application-oriented knowledge allows the students to compare advantages and disadvantages of the individual industrial bus systems, to examine in contrast the advantages and disadvantages of the individual programming languages to find optimal solutions.

### **Soft Skills**

The students work on problems in a focused and independent way.

They can communicate their solutions both verbally and in writing in appropriate technical language.

They learn from mistakes, can assess and improve their own abilities.

They are able to work actively as a team.

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### **Course contents**

1. Function of SPS
    - 1.1. Hardware requirements
    - 1.2. Current embodiments
    - 1.3. Environmental conditions
    - 1.4. Real-time requirements
  2. Programming languages
  3. Presentation of automation technology with regard to industrial communication
    - 3.1. ISO / OSI model in industrial communication
    - 3.2. Automation pyramid
    - 3.3. Vertical communication
    - 3.4. Structure and functionality of common communication systems
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<b>Recommended literature</b>	<p>-R. Laubner / P. Göhner: Prozessautomatisierung I. Springer Verlag 1999.</p> <p>-G. Wellenreuther / D. Zastrow: Steuerungstechnik mit SPS, Springer/Vieweg 2015.</p> <p>-G. Wellenreuther: Automatisieren mit SPS - Übersichten und Übungsaufgaben, Springer/Vieweg 2015.</p> <p>-K. John / M. Tiegelkamp: SPS-Programmierung mit IEC, Springer Verlag 2009.</p> <p>-G. Schnell: Bussysteme in der Automatisierungstechnik, 4. Auflage. Vieweg Verlag 2000.</p> <p>-W. Kriesel / O. Madelung: AS-Interface – Das Aktuator-Sensor-Interface für die Automation. Hanser Verlag 1999.</p> <p>-M. Popp: Profibus-DP/DPV1, 2. Auflage. Hüthig Verlag 2000.</p> <p>-M. Popp: Das PROFINET IO-Buch: Grundlagen und Tipps für Anwender, 2. Auflage. VDE Verlag 2010.</p> <p>-Ausbildungsunterlagen der Fa. Siemens: <a href="http://www.siemens.com/global/de/home/unternehmen/nachhaltigkeit/ausbildung/sce.html">www.siemens.com/global/de/home/unternehmen/nachhaltigkeit/ausbildung/sce.html</a></p>
<b>Teaching methods</b>	Seminars with practical experience Work studies in the lab
<b>Assessment method</b>	Written examination, 90 min.
<b>Language of instruction</b>	English
<b>Prerequisites</b>	None

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## A Business process case study in SAP for Beginners

<b>Course title</b>	A Business process case study in SAP for Beginners
<b>ECTS</b>	5
<b>Course type</b>	Lecture
<b>SWS</b>	4
<b>Semester</b>	Summer
<b>Workload in hours</b>	Total: 150 / In-class: 60 / Self-study: 90
<b>Lecturer</b>	Prof. Dr. Dieter Rummler
<b>Course objectives</b>	<p>It will be shown to beginners in the area of Enterprise Resource Planning Systems (ERP) the functions of ERP systems. This is done by carrying out a business process from entering a sales order to its production and delivery. At the same time the consequences in finance and accounting are shown. This makes connections in business administration visible.</p> <p>SAP R/3 is used for this. No prerequisites are required for this. The user interface, the handling of SAP R/3 and the necessary SAP transactions are explained. Essentially, in group work, an SAP case study created by myself is carried out by the students on their computers.</p>

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	<ul style="list-style-type: none"><li>• What is ERP</li><li>• User interface and handling of SAP R/3</li></ul> <p><b>Case study:</b></p> <ul style="list-style-type: none"><li>• Master data</li><li>• Sales forecast</li><li>• Customer order</li><li>• MRP run</li><li>• Purchasing the components</li><li>• Production of the assembly and the final product</li><li>• Delivery of the sales order</li><li>• Invoicing</li><li>• Incoming payments</li><li>• Finance</li><li>• Controlling</li></ul>
<b>Course contents</b>	
<b>Teaching methods</b>	Lecture / case studies
<b>Assessment method</b>	Written examination, 90 min.
<b>Language of instruction</b>	English
<b>Prerequisites</b>	None

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## From Data to Big Data Analysis

<b>Course title</b>	From Data to Big Data Analysis and Business Intelligence
<b>ECTS</b>	5
<b>Course type</b>	Lecture
<b>SWS</b>	4
<b>Semester</b>	Summer
<b>Workload in hours</b>	Total: 150 / In-class: 60 / Self-study: 90
<b>Lecturer</b>	Prof. Dr. Dieter Rummler
<b>Course objectives</b>	<p>This course brings you from Data to Big Data Analysis and Business Intelligence.</p> <p>You need basic knowledge in mathematics. No programming skills necessary. All used tools you can download for free.</p> <p>In EXCEL we will work with diagrams and Power Pivot tables, after an introduction to fundamentals in EXCEL. We will enter more intelligence to data with the tool POWER Business Intelligence (BI). We will add interesting insights to data to find information which are important for our business. We will also look forward to work with artificial intelligence to find relationships and correlations between data, and we will classify data.</p> <p>After this course, the student understands the way how to get from pure data from different sources important information, insights and knowledge for daily and strategic company decisions.</p>
<b>Course contents</b>	<p>Part 1 – Spreadsheet calculation</p> <ul style="list-style-type: none"> <li>• Basics</li> <li>• Addressing</li> <li>• Data maintenance</li> <li>• Formula and functions</li> <li>• Reports</li> </ul> <p>1.1. Spreadsheets 1.2. Subtotals 1.3. Diagrams 1.4. Pivot tables</p>

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Part 2 – Bringing data together from different sources  
Part 3 – Creating web and mobile phone dashboards  
Part 4 – Looking for insights  
Part 5 – Classification of data  
Part 6 – Adding artificial intelligence to data

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**Teaching methods**      Lecture

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**Assessment method**      Written examination, 90 min.

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**Language of instruction**      English

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**Prerequisites**      None

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