Module Guide

Certificate programs in English Language

Summer Term 2018
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1 Introduction to RF Engineering

Token / Number: RFE

German title: Einführung in die Hochfrequenztechnik

Credits: 3 ECTS

Language: English

Turn / Duration: every Summer Term / 1 Semester

Module authority: Prof. Dr. Wolfgang Menzel

Training staff: Prof. Dr. Wolfgang Menzel
Dr.-Ing. Tobias Chaloun

Integration of module into courses of studies: Suitable as introductional course for the MSc course Sensor Systems

Requirements (contentual): - Basics of electrical engineering
- Advanced mathematics (complex calculation, basics of vector analysis)
- Analogue circuits
- Signals and systems

Learning objectives: With the successful completion of this module, the participants shall be able to describe basic properties of important radio frequency components and to use their performance to design respective circuits. They will be capable to apply basic methods for the analysis and the design of state-of-the-art RF circuits and systems.

Content:
- Short summary of mathematical basics
- Real circuit devices
- Short overview on Maxwell’s equations, boundary conditions, wave equation, vector potential, Pointing vector, skin effect, plane waves
- Waves on transmission lines
- Smith chart, reflection of waves at load impedances, impedance transformation by transmission lines and other circuit elements
- Wave amplitudes, description of linear, time-invariant wave-based N-ports by scattering parameters, signal flow diagrams
- Electronic noise
- Components like filters, couplers, amplifiers, mixers
- Basic terms of antenna technology
- Introduction into wave propagation

Literature: - Online course material
- Text books: see online list

Modes of learning and teaching: Online course with lecture videos, lecture viewgraphs, exercises, online consultation

Estimation of effort: Self-Study: 50 h
Preparation, Follow-up, Exercises, Practice: 20 h
Exam preparation: 20 h
Sum: 90 h

Course assessment and exams: Oral exam
<table>
<thead>
<tr>
<th>Requirements (formal):</th>
<th>None</th>
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<tr>
<td>Grading:</td>
<td>The course score is that of the oral exam</td>
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2 Introduction to Business Administration

Token / Number: IBA

German title: Grundlagen der Betriebswirtschaftslehre

Credits: 3 ECTS

Language: English

Turn / Duration: every Winter Term / 1 Semester

Module authority: Prof. Dr. Kai-Uwe Marten

Training staff: Prof. Dr. Kai-Uwe Marten

Integration of module into courses of studies: Suitable as introductory course for the MSc course Innovation and Science Management

Requirements (contentual): None

Learning objectives: In the course “Introduction to Business Administration” students receive basic knowledge in business administration. The course facilitates the study of various continuing education modules with a business administration context. The participants will be able to recognize the links between performance and monetary circulation. They will be able to evaluate the impact of entrepreneurial decisions on the balance sheet and the income statement in order to derive conclusions for the management of the corporation.

The course provides an overview on five important segments of business administration: setting up a firm, production, marketing, investment and financing, accounting.

Due to this introductory course the participants are able to review and describe important aspects of business administration as well as gain deeper knowledge in the various topics.

Content:
- Setting up a firm
- Production
- Marketing
- Investment and Financing
- Accounting

Literature:

Modes of learning and teaching: On-campus meetings:
- Introduction with tutorial: 8 h
- Exam: 2 h

E-Learning:
- Webinar: 4 h
- Online seminar: 4 h
- Self-Study: 64 h
- Chat for exam preparation: 8 h

Estimation of effort:
Self-Study: 12 h
Deepening exercises/case studies: 76 h
Exam: 2 h
Sum: 90 h
<table>
<thead>
<tr>
<th>Course assessment and exams:</th>
<th>The exam is a written exam. For admission, the following requirements have to be met:</th>
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<tbody>
<tr>
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<td>- Participation in the on-campus day</td>
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<td>In case of hardship the candidate can write an informal request to the coordinator in order to be given admission to the exam. In case of sickness a doctor's certificate has to be submitted to the coordinator.</td>
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<tr>
<th>Requirements (formal):</th>
<th>None</th>
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| Grading:                    | The grade of the module will be the grade of the exam.                |
# Technical Presentation Skills

<table>
<thead>
<tr>
<th>Token / Number:</th>
<th>TPS</th>
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<tbody>
<tr>
<td>Credits:</td>
<td>3 ECTS</td>
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<tr>
<td>Language:</td>
<td>English</td>
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<td>Turn / Duration:</td>
<td>every Summer Term / 1 Semester</td>
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<tr>
<td>Module authority:</td>
<td>Prof. Dr.-Ing. Hermann Schumacher</td>
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<tr>
<td>Training staff:</td>
<td>Prof. Dr.-Ing. Hermann Schumacher</td>
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<tr>
<td>Integration of module into courses of studies:</td>
<td>Optional Non-Technical Module</td>
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| Requirements (contentual): | - Basic knowledge of presentation software (e.g. PowerPoint, LibreOffice Impress)  
- Bachelor-level engineering background |
| Learning objectives: | Students recognize proven techniques for technical oral presentations supported by visual aids. In the preparation of their presentation, they distinguish different target audiences and devise their presentation strategy accordingly. They differentiate between different forms of presentation (oral, written, web-based) and develop suitable communication strategies. Students create an oral presentation on a topic of their choice within an annually changing topical framework, defend their ideas in front of their peers, and summarize their presentation in a three-page written report. |
| Content: | - Presentation quality criteria  
- Researching a subject  
- Structuring oral presentations  
- Visual aids preparation  
- Multimedia techniques  
- Public speaking  
- Handling questions and critique  
- Written presentations:  
  1. Research reports  
  2. Journal articles  
  3. Theses  
- Presenting technical matters on the web  
- Seminar trial presentations |
| Modes of learning and teaching: | Online lecture and supporting reading material  
Seminar in block format (2 dates of 6 hours each) |
| Estimation of effort: | Online materials and assessments: 28 h  
Seminar participation: 12 h  
Research and preparing seminar presentation: 30 h  
Preparing written report: 20 h  
Sum: 90 h |
| Course assessment and exams: | - Completion of all online assessments  
- Seminar presentation  
- 3-page written report |
| Requirements (formal): | No compulsory prerequisites |