# Course-specific structure

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<td><em>General Elective courses</em></td>
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<td><em>Specialization</em></td>
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<td><em>Theoretical and Applied Mathematics</em></td>
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<td><em>Software Lab Project</em></td>
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<td><em>Computational Electromagnetics</em></td>
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<td><em>Computer Architecture</em></td>
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<td><em>Numerical Mathematics</em></td>
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<td><em>Introduction to High Performance Computing</em></td>
<td><em>Introduction to High Performance Computing</em></td>
<td><em>Real World Differential Equations</em></td>
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Course overview for the specialization Computational Electrical Engineering starting in the summer semester and the specializations Computational Mechanical Engineering and Computational Physics are available on www.ief.uni-rostock.de/?L=1 – section "Studies".
Degree
Master of Science (M.Sc.)

Type of Program
graduate (with a second academic degree)
one major subject degree (not combinable)
language: English, single modules in German
The entire course may be completed in English language.

Duration
4 semesters

Start Date
in winter semester (Oct. 1st) and in summer semester (Apr. 1st); specialization CP: start only in winter semester, specializations CEE and CME: start recommended in winter semester

Start-up support
Assistance during the start of studies and orientation in Germany with the help of mentoring from students for students

Fields of Study
Engineering / Electrical Engineering / Mechanical Engineering
Natural Sciences / Physics

Formal Requirements
Completion of a first academic degree in Computational Science and Engineering, Electrical Engineering, Information Technology, Mechanical Engineering, Physics or an equivalent degree and
• native language English or proof of sufficient knowledge of English at the level B2 of the Common European Framework of Reference for Languages (CEFR)
• proof of profound knowledge relevant for the areas of specialization: CEE: Electromagnetic Fields and Waves,

CME: Technical Mechanics, CP: Quantum Mechanics, Optics, Statistical Physics and Mathematics for each
• Bachelor with at least 180 credit points and at least 75% of the CGPA (Cumulative Grade Point Average) or equivalent rating

Advanced Qualification Options
graduate to Dr.-Ing. or Dr. rer. nat.

Purpose and Objective
Computational Science and Engineering is a new, rapidly growing field that is, in addition to the major subject, based on Applied Mathematics and Computer Science. The aim of the course is the acquisition of skills to carry out computer simulations of technical and natural systems in Electrical or Mechanical Engineering as well as Physics based on a sound knowledge of numerical methods. Numerical Simulations allows the work on fields that are inaccessible to conventional tests and investigation methods. As computers get more powerful, the scope for modeling and simulation is constantly expanding. In many cases, the design process is already happening only inside the computer.

There are three specializations offered:
• Computational Electrical Engineering (CEE)
• Computational Mechanical Engineering (CME)
• Computational Physics (CP)

Premises for the Study
You have profound knowledge in mathematics and natural sciences as well as advanced English language skills. You are particularly interested in scientific-technical and engineering-based issues as well as research-oriented work.

Content of the Master Program
In the first three semesters, you deepen your knowledge in numerical analysis, partial differential equations, as well as high-performance computing and your classes from the respective module catalog. There are compulsory German courses for all majors. German-speaking students select another language. The fourth semester is reserved for the master thesis.

Special Features
The course is offered in English language and is therefore equally suitable for English-speaking international students and for German-speaking students who want to develop and apply their English language skills intensively.

Career Prospects
Within this course, you will acquire a broad range of skills that is indispensable for engineers and physicists with a focus on simulation and numerical computing methods. The university master's degree offers best possibilities for a leading or researcher position in the field of engineering in Germany and abroad, or to enter a doctoral program. The ever-growing demand for engineers and physicists with profound knowledge of computational mathematics opens up prospects for the future with excellent career opportunities.