



TECHNISCHE UNIVERSITÄT  
CHEMNITZ

# Automotive Software Engineering

Faculty of Computer Science

Master degree program



„80% of future innovations in the automobile industry will be based upon electrical devices, 90% of these controlled by software.“

Klaus Grimm, Initiator of the GI special interest group Automotive Software Engineering



## What characterizes the Master degree program Automotive Software Engineering?

Automotive, avionics and mechanical systems are important application areas for most modern industries. The design of embedded control units in these areas relies on methods of computer science and engineering. Specific aspects of the development of these hardware/software systems are in the main focus of this Master degree program. The program provides knowledge and skills in three fields:

- Automotive Software Engineering
- Embedded Systems
- Real-Time and Communication Systems



"I am studying Automotive Software Engineering at Technische Universität Chemnitz because of the provided outstanding environment: we develop course-related applications on original onboard control units of well-known automobile manufacturers. We process data from genuine BMW test vehicles and attend lectures held by guest professors that work for potential future employers, and teach in-depth knowledge and practical experiences."

Chirill Svet, graduate of the Master degree program Automotive Software Engineering

# Degree Structure

## Automotive Software Engineering (1st-3rd semester)

- Formal Specification and Verification
- Elective modules, e.g.
- Automotive Software Engineering
  - Multicore Programming
  - Optimization in Compiler Construction
  - Image Processing
  - Model-Driven Software Development
  - Software Engineering and Programming Foundations

## Embedded Systems (1st-3rd semester)

- Software Platforms for Automotive Systems
  - Software Design for Embedded Systems
- Elective modules, e.g.
- Hardware/Software-Codesign I und II
  - Distributed Operating Systems
  - Embedded Software Lab
  - Automotive Sensor Systems
  - Advanced Integrated Circuit Technology

## Real-Time and Communication Systems (1st-3rd semester) Computer Science (1st-3rd semester)

- Elective modules, e.g.
- Software Service Engineering
  - Timing-Aware Programming for Embedded Systems
  - Real-Time Systems
  - Dependable Systems
  - Mobile Networks

- Elective modules, e.g.
- Data Security and Cryptography
  - Hardware Development with VHDL
  - Computer Graphics
  - Neurocognition
  - Human-Computer Interaction

## Key Competences (2nd-3rd semester)

- Current Trends in Computer Science
- Fundamental Scientific Methods
- Business Planning and Management of Startups
- Distribution of Technical Devices
- Spanish
- For non-native German speakers: German as a foreign language

## Module Research Seminar Computer Science and Module Research Internship (3rd semester)

## Module Master Thesis (4th semester)

# Research

The Master degree program is closely connected to the special interest research area “Embedded Self-Organizing Systems” (ESS) of the Faculty of Computer Science. Therefore, courses and labs are often integrated in current research projects. Well-known industry partners, for example BMW and Airbus, offer opportunities for practical research trainings.

# Career Opportunities

Companies and OEMs in the automotive and aviation industry seek graduated engineers who have successfully completed this Master degree program. Employment opportunities include: product development for control units, applied research and quality assurance.

## General Information

Admission requirements: in general vocationally-qualifying university bachelor's degree in Applied Computer Science, Computer Science or equivalent degree program with regard to content

Standard period of study: 4 semesters

Degree: Master of Science (M.Sc.)

Start of the degree program: winter and summer semester

Language of tuition: German or English

**For information concerning all aspects of studies please access:**

[www.tu-chemnitz.de/studentenservice/index.php.en](http://www.tu-chemnitz.de/studentenservice/index.php.en)

**Online application for German students:**

[www.tu-chemnitz.de/studienbewerbung](http://www.tu-chemnitz.de/studienbewerbung)

**Online application for international students:**

[www.uni-assist.de](http://www.uni-assist.de)

**Further information:**

Technische Universität Chemnitz

Student Service Point

Straße der Nationen 62, room 043

09111 Chemnitz

+49 371 531-33333

[studentensekretariat@tu-chemnitz.de](mailto:studentensekretariat@tu-chemnitz.de)

**Academic Course Guidance**

For an overview of all academic counsellors including contact details please access:

[www.tu-chemnitz.de/studienberater](http://www.tu-chemnitz.de/studienberater)

**Central Course Guidance Service**

Technische Universität Chemnitz

Central Course Guidance Service

Straße der Nationen 62, room 046

09111 Chemnitz

+49 371 531-55555

[studienberatung@tu-chemnitz.de](mailto:studienberatung@tu-chemnitz.de)



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