



UNIVERSITY OF TECHNOLOGY
IN THE EUROPEAN CAPITAL OF CULTURE
CHEMNITZ

Faculty of Electrical Engineering
and Information Technology

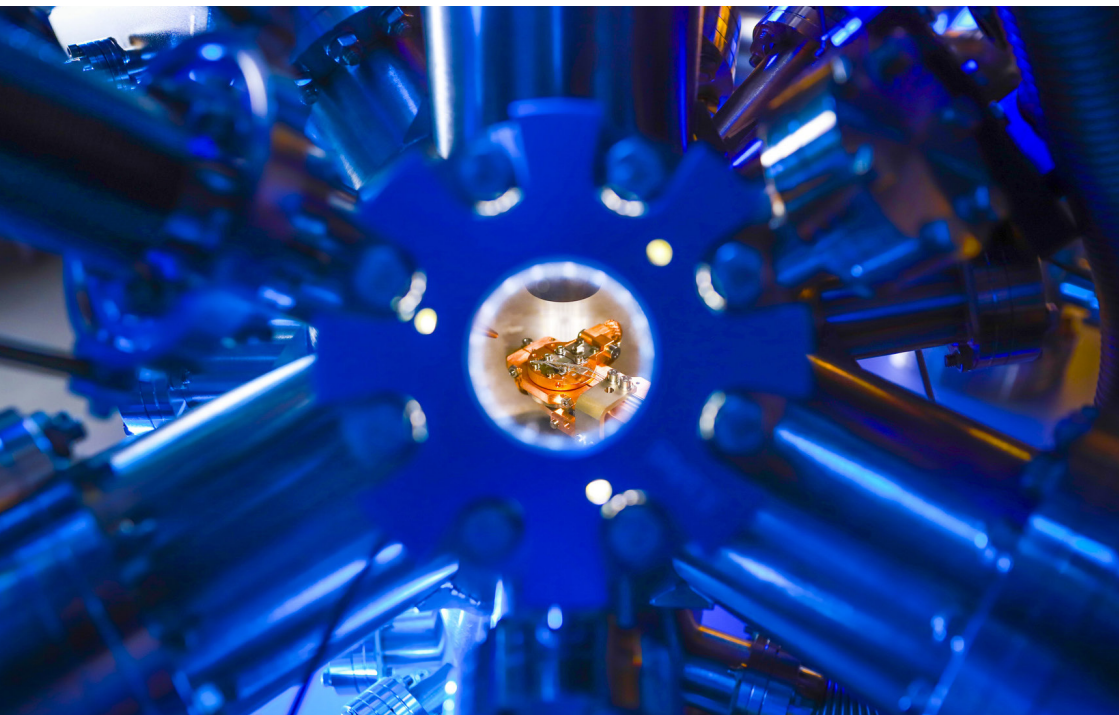
English language Master's degree
programmes

Design and Test for Integrated Circuits

Embedded Systems

Information and Communication Systems

Micro and Nano Systems



www.tu-chemnitz.de



Overview of all degree programmes
www.tu-chemnitz.de/studiengaenge



Website of the Faculty
www.tu-chemnitz.de/etit/

Online application
<https://campus.tu-chemnitz.de/>



Overview of the English language Master's degree programmes

Master Design and Test for Integrated Circuits

Admission requirements: in general vocationally-qualifying university Bachelor's degree in Electrical Engineering and Information Technology from Chemnitz University of Technology or equivalent degree programme with regard to content, English language proficiency at Level B2 and German language proficiency at level A2 according to the CEFR

Standard period of study: 4 semesters

Degree: Master of Science (M.Sc.)

Start of the degree programme: usually winter semester

Language of tuition: English

Master Embedded Systems

Admission requirements: in general vocationally-qualifying university Bachelor's degree in Electrical Engineering and Information Technology from Chemnitz University of Technology or equivalent degree programme with regard to content, English language proficiency at Level B2 and German language proficiency at level A2 according to the CEFR

Standard period of study: 4 semesters

Degree: Master of Science (M.Sc.)

Start of the degree programme: usually winter semester

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Master Information and Communication Systems

Admission requirements: in general vocationally-qualifying university Bachelor's degree in Electrical Engineering and Information Technology from Chemnitz University of Technology or equivalent degree programme with regard to content, English language proficiency at Level B2 and German language proficiency at level A2 according to the CEFR

Standard period of Study: 4 semesters

Degree: Master of Science (M.Sc.)

Start of the degree programme: usually winter semester

Language of tuition: English

Master Micro and Nano Systems

Admission requirements: in general vocationally-qualifying university Bachelor's degree in Electrical Engineering, Information & Communication Technology from Chemnitz University of Technology or equivalent degree programme with regard to content, English language proficiency at Level B2 and German language proficiency at level A2 according to the CEFR

Standard period of study: 4 semesters

Degree: Master of Science (M.Sc.)

Start of the degree programme: usually winter semester

Language of tuition: English

Master Design and Test for Integrated Circuits

The programme provides a future-oriented education in the fields of designing, manufacturing and testing of integrated circuits. The initial theory courses are the base for the more practical oriented modules later. All courses are held by researchers actively working in the field enabling best up-to-date skills for the professional career of the graduates.

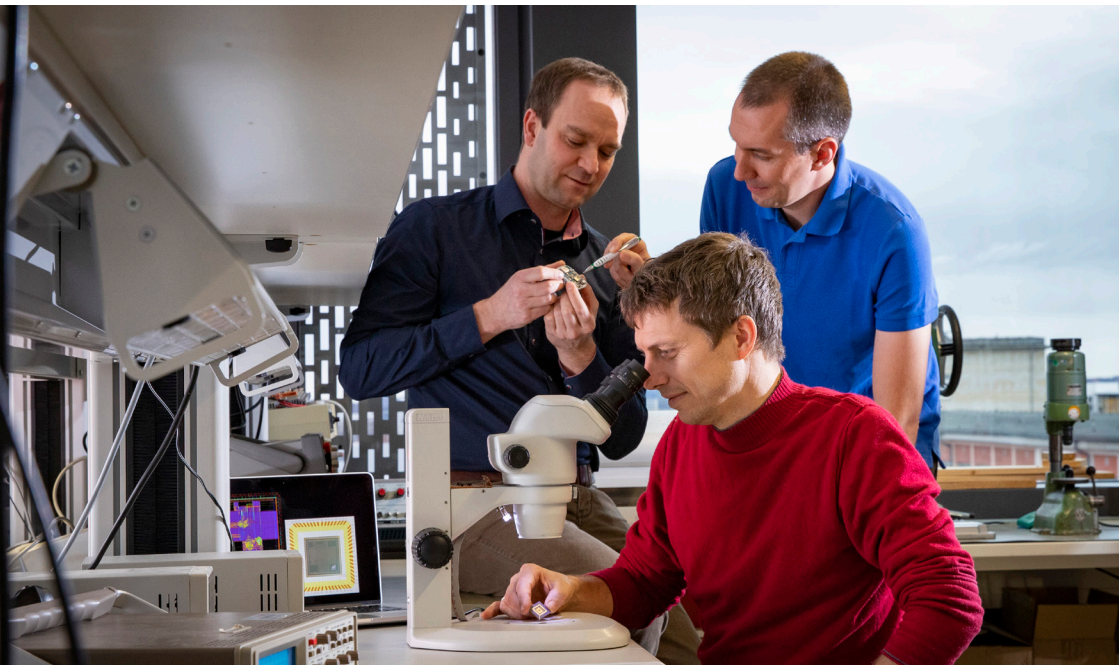
“This Master’s programme expertly blends theoretical knowledge with hands-on experience, providing a comprehensive understanding of the increasing necessity of semiconductor test. Students can look forward to becoming part of a pioneering community that is at the forefront of technological innovation and securing a promising future in the global tech industry.”

Dr. Ralf Montino, Vice President PLI, Elmos Semiconductor SE



“IC design is at the heart of semiconductor innovation, enabling the creation of new, more powerful, and energy-efficient devices. This Master degree program equips graduates with skills and knowledge for a wide range of excellent career opportunities in Saxony, but also Germany and worldwide.”

Uwe Gaebler, Senior Director Development Center for Automotive Electronics and Artificial Intelligence, Infineon Technologies



Degree Structure

Basic Modules (1st - 2nd semester)

- Design of Digital Systems
- Design of Heterogeneous Systems
- Test of Digital and Mixed- Signal Circuits
- Elements of Integrated Circuits
- Technologies for Micro and Nano Systems
- Integrated Circuit Design - Transistor Level
- Reliability of Micro and Nano Systems

Practical Oriented Modules (2nd - 3rd semester)

- Research Internship
- Research Project
- Applied Circuit Design and Testing
- Layout of ICs and PCBs

Module Master's Thesis (4th semester)

Focal Modules (1st - 3rd semester)

- Modern microscopies
- Verification of Digital Systems
- Numerical Methods for Materials and Reliability of Micro and Nano Systems
- Failure Analytical Methods for Micro and Nano Systems
- Smart Sensor Systems
- Semiconductor Physics - Nano Structures
- Advanced Integrated Circuit Technologies
- Microsystems Design
- Micro and Nano Devices
- Flexible Electronics
- Digital Components and Architectures for Data Processing
- Multisensorial Systems
- Digital Signal Processing
- Programming and Data Analysis
- Optimisation in Applications
- Advanced Methods for Integrated Circuits

Career Opportunities

The possibilities for the graduates are excellent. They may work in IC design houses, fabs, semiconductor test companies and device characterisation departments. The English course language enables you to work world-wide, f.e. in the following areas:

- Semiconductor industry
- Chip and sensor industry
- Automotive, aviation and railway industry
- Research and development at universities
- Employment at state-owned and private research facilities

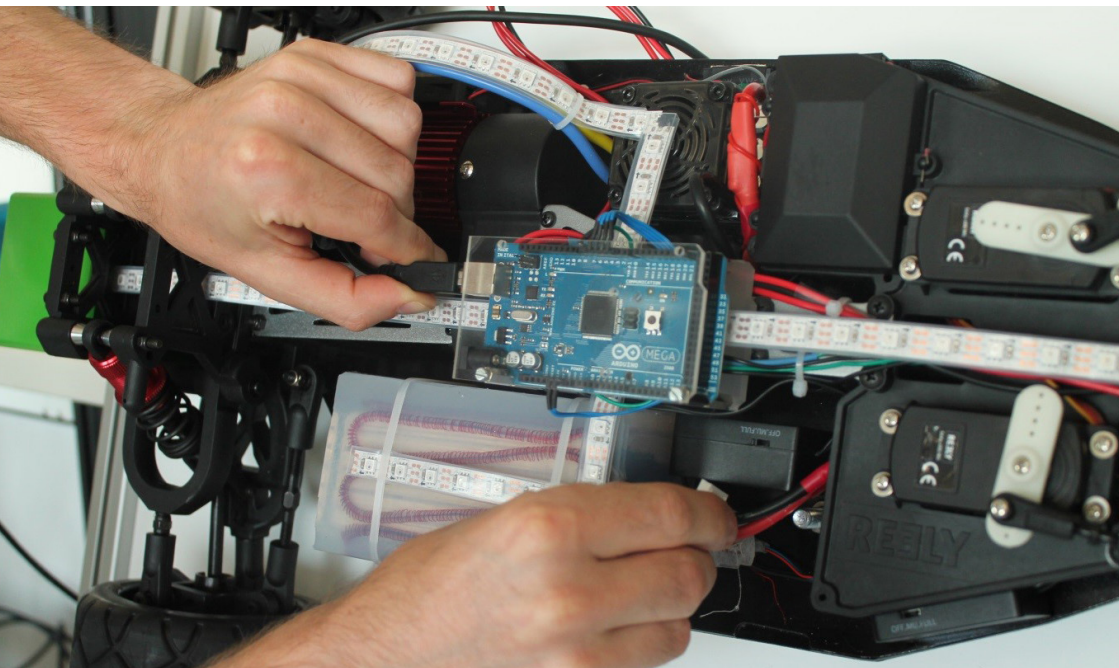
Master Embedded Systems

Embedded systems are important in industry and research as a key technology and make our daily life more comfortable and safer. Embedded systems are ubiquitous, and today's economy and society would not survive without them. They drive innovation and help for diversification of products in terms of functionality, efficiency and quality. The English language programme provides a world-class education with focus on future challenges of embedded systems. Graduates will gain the ability to solve engineering tasks at the interface between hardware and software. The aim here is to develop intelligent system solutions by combining microsystem technologies, information and communication technologies and software development. Therefore, besides the theoretical education also the practical training plays an important role.



“Sensor systems offer interesting examples for Embedded Systems. They need a dedicated electronics for signal acquisition and amplification. By means of digital signal processing the measurement information can be extracted and transmitted. The decision about hardware and software realisation of system functionality needs experts which are educated in both fields.”

Prof. Dr. Olfa Kanoun, Chair for Measurement and Sensor Technology



Degree Structure

Basic Modules (1st - 2nd semester)

- **Components for Embedded Systems:**

Digital Components and Architectures for Data Processing, Smart Sensor Systems, Digital Signal Processing 1, Computer Vision 1, Design of Software for Embedded Systems, Real-Time Systems, Project Lab Embedded Systems

- **System Design:**

Design of Digital Systems, Hardware/Software-Codesign I

Focal Modules (2nd - 3rd semester, Elective Modules)

- **System Design:**

Design of Heterogeneous Systems, Test of Digital and Mixed-Signal Circuits, Hardware/Software Codesign II, Hardware Acceleration using FPGAs, Verification of Digital Systems

- **Automotive Systems:**

Advanced Platforms for Automotive Systems, Automotive Sensor Systems

- **Signal Processing:**

Image Processing and Pattern Recognition, Multisensorial Systems, Digital Signal Processing 2, Video Signal Processing, Computer Vision 2, Programming and Data Analysis, Mobile Localization and Navigation, Antennas and Wave Propagation, Self-Organizing Networks, Network Security

- **Embedded Systems:**

Advanced Embedded Systems

- **Nontechnical Modules:**

Optimization for non-Mathematicians, Management Accounting, Communication and Leadership

Module Research Project and Research Internship (3rd semester)

Module Master's Thesis (4th semester)

Career Opportunities

The possibilities for graduates are excellent both in science and in industry, because of the increasing importance and the high potential for innovation in embedded systems. The English Master program trains the abilities to become a global player in his field. In addition, the occupation of leadership positions in management is also possible.

- Automotive industry
- Aerospace
- Sensor industry
- Chip industry
- Robotics
- Plant Engineering
- Software development
- Research

Master Information and Communication Systems

This English-language Master's degree programme covers a wide range of modules with the focus on future challenges of the increasingly globalised field of Information and Communication Systems. Digitisation and the increasing penetration of private and occupational areas of life by Information and Communication technologies will extensively shape the information society of the future. Students at Chemnitz University of Technology are qualified to solve engineering problems and to work in research and development as well as in management positions. Focal points of the degree course are Communications Engineering, Microwave Engineering and Photonics, Circuit and System Design, Communication Networks, Digital Signal Processing and Circuit Theory.



"In today's world, there is practically no engineering application that does not contain elements of Information Systems and Technology. The universal scope of this field makes it an indispensable and futuristic branch of electrical engineering. The new Master's degree programme, the university, and the city of Chemnitz – a city with an illustrious technological heritage – together offer a most promising academic and cultural experience with unparalleled value-for-investment. We look forward to processing your application."

Prof. Dr. Madhukar Chandra, Head of Chair



Degree Structure

Lectures are given by professors with a sound background from industry and research who formerly worked at Nokia, Siemens Networks, Loewe, Alcatel-Lucent, Daimler and the German Aerospace Center.

Basic Modules (1st - 3rd semester)

- Design of Digital Systems
- Advanced Mobile and V2X Communication
- Digital Signal Processing
- Basics of Microwave and Photonic Systems
- Next Generation Internet

Focal Modules (1st - 3rd semester)

- Image Processing and Pattern Recognition
- Digital Signal Processing
- Video Signal Processing
- Programming and Data Analysis
- Aerospace Remote Sensing
- Antennas and Wave Propagation
- Design of Heterogeneous Systems
- Test of Digital and Mixed-Signal Circuits
- Verification of Digital Systems
- Hardware Acceleration using FPGAs
- IP Networking and Software Defined Networking Lab
- Communication Networks Seminar
- Network Security
- Self-Organizing Networks
- Optimization for Non-Mathematicians
- Management Accounting
- Communication and Leadership

Module Research Project (3rd semester)

Module Master Thesis (4th semester)

Career Opportunities

Graduates are offered excellent career opportunities both in academia and in the global Information and Communication industry. Also occupational activities in management are possible.

Graduates are well prepared for working at:

- communication equipment manufacturers
- network operators
- consulting companies
- research institutes
- automotive companies
- aerospace companies

Master Micro and Nano Systems

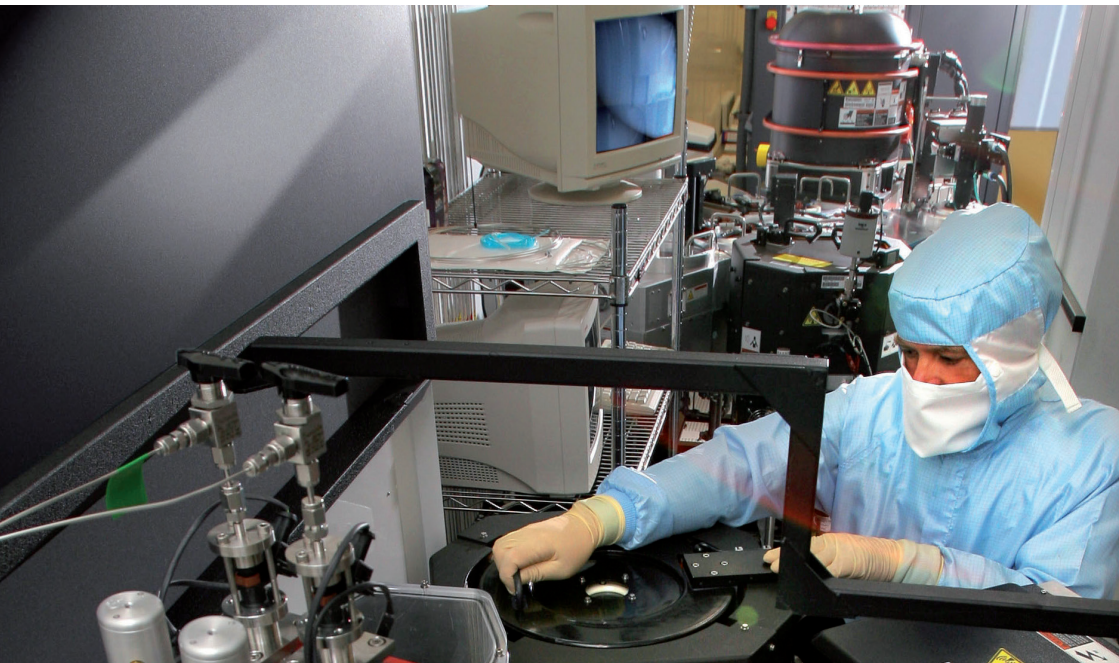
The programme provides world-class, future-oriented education in design, manufacturing, characterisation and integration of miniaturised components into engineering systems.

The interdisciplinary courses cover fundamental theoretical knowledge in physics and engineering but also application-oriented skills in developing innovative products, in business administration and management. Classes and practical training address current and prospective needs of industrial and academic research.



"Studying Micro and Nano Systems was a very good choice for me. I am very passionate about the application-oriented character of the degree programme and the possibilities of research in the clean room facilities at the Center of Microtechnologies at the University Campus. Also, because of the internationally-recognised Master's degree, I can start my doctorate anywhere in the world."

Benchirouf Abderrahmane, Student of Micro and Nano Systems



Degree Structure

Basic Modules (1st - 2nd semester)

- Microsystems design
- Design of Heterogeneous Systems
- Semiconductor physics / Nanostructures
- Micro and nano devices
- Smart Sensor Systems
- Reliability of micro and nano systems
- Technologies for micro and nano systems
- Advanced integrated circuit technology
- Materials in micro and nano technologies

Focal Modules (2nd - 3rd semester)

- Automotive Sensor Systems
- Integrated circuit design – transistor level
- Fields and Waves
- Design for Testability for Circuits and Systems 2
- Power semiconductor devices
- Microscopy and analysis on the nano scale
- Optoelectronic devices
- Surfaces, Thin films and Interfaces
- Micro optical systems
- Self-Organizing Networks
- Network Security

Module Research Project (3rd semester)

Module Master Thesis (4th semester)

Career Opportunities

The possibilities for graduates are widespread, because of the high potential for innovation in nano and micro systems. The teaching language, English, offers degree holders excellent chances to become global actors, for example in the following areas:

- Automotive industry
- Semiconductor industry
- Chip and sensor industry
- Plant engineering
- Research and development at universities
- Employment at state-owned and private research facilities

GENERAL INFORMATION

Application for German students: <https://campus.tu-chemnitz.de/>

Application for international students: www.uni-assist.de

Information about the application process for German students: www.tu-chemnitz.de/studienbewerbung

Information about the application process for international students: https://www.tu-chemnitz.de/studierendenservice/studserv/bewerbung/bew_bamala.php.en

FURTHER INFORMATION:

Studying in Chemnitz

www.study-in-chemnitz.com

FAQ - Frequently Asked Questions

www.tu-chemnitz.de/studierendenservice/faq.php.en

Student Service Point

Straße der Nationen 62, room A10.043

+49 371 531-12125

admission@tu-chemnitz.de

Central Course Guidance Service

Straße der Nationen 62, room A10.046

+49 371 531-55555

studienberatung@tu-chemnitz.de

Academic Course Guidance

For an overview of all academic counsellors

www.tu-chemnitz.de/studienberater

Postal address

Technische Universität Chemnitz

Studierendenservice und Zentrale Studienberatung

09107 Chemnitz

Photos: PTU Chemnitz, Frank Schettler, Thomas Günther,
Uwe Meinhold, Wolfgang Thierme, private

Last update: August 2024