

TECHNISCHE UNIVERSITÄT

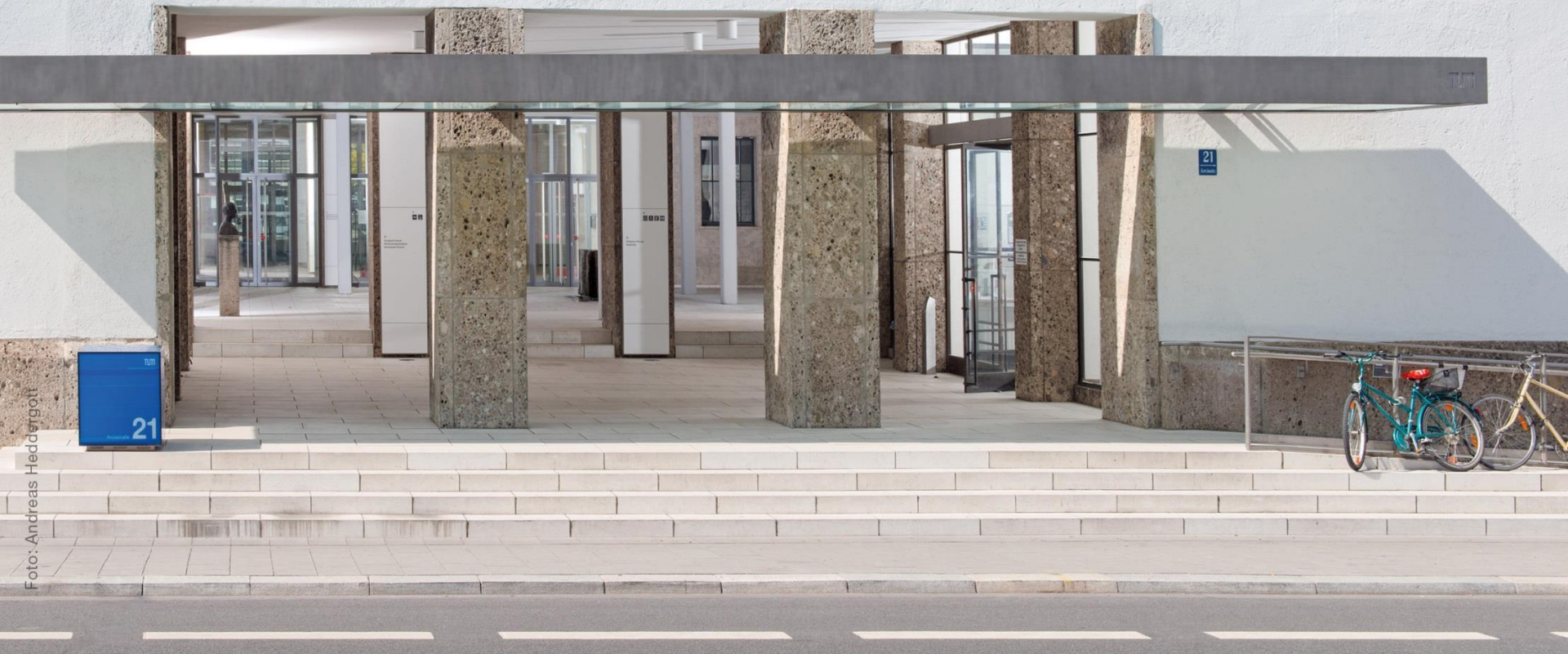


Foto: Andreas Heddergott

# Master's Days – MSEI, MSCE, MSNE

TUM School of Computation, Information and Technology

24.03.2023

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and Iris Schachtner (MSCE)

# Questions Asked in Advance

## Here for Information only

- I do not have a specific question yet, I just want to inform myself.
- Perfect 😊, if any questions arise during the session, ask them in the chat we will keep track and try to answer them...

## Field 1 – Prerequisites and Application

- How are the possibilities with a Bachelor in XXX? And how about one from a FH/TH?
- Do TUM Bachelor Graduates have to go through the Aptitude Assessment phase as well?
- How about Language requirements?

### ➤ Prerequisites:

- (Basically any technical) Bachelor Degree, no matter if TUM, other University, dual or FH/TH
- A certain number of ECTS/Credits from the Fields Mathematics, Physics, Electrical & Computer Engineering
- Combined with grade of the Bachelor to result in a score
- Depending on the score: Direct acceptance, Interview, Direct Rejection
- German language Certificate essentially needed for the application not later (MSEI)! No proof of English needed (MSEI).

## Field 1 – Prerequisites and Application

- How and when to apply in the case of me finishing my Bachelors at TUM in the coming semester
- Can I apply before I get my degree certificate?
- Can I do master modules while still in bachelors and then use the credits?

### ➤ Transfer from Bachelor

- Application: 01.04.-31.05 for winter term and 1.10.-30.11. for summer term
- Transcript of records is sufficient for application, (preliminary) Certificate needed at latest for enrollment
- Application via TUMonline
- For international applicants get your degree checked by [uni-assist.de](http://uni-assist.de)

## Field 1 – Prerequisites and Application

- Transfer from another University?
  - General questions regarding application and Living in Munich
  - Should I start working after graduating from Bachelor's before continuing with Master's?
- 
- **Transfer from other University**
    - Can be done but usually with a loss of Credits.
    - High risk, usually not recommended!
    - Contact us beforehand ([studienberatung@ei.tum.de](mailto:studienberatung@ei.tum.de))
  - **Living in Munich**
    - Student housings provided by the Studentenwerk München (long waiting lists)
  - **Working before Masters**
    - Up to you.

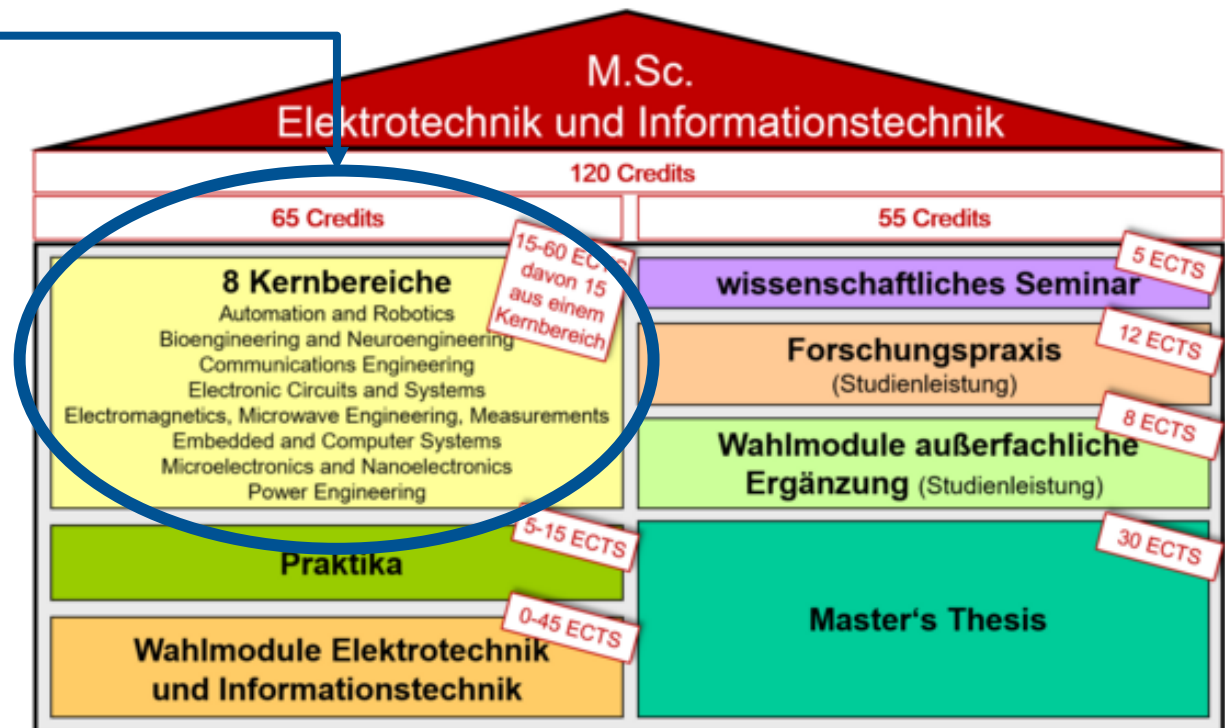
# Questions Asked in Advance

## Field 2 – During the Masters

- What does the brief overview of the degree look like
- Am I making the right choice choosing this Master's degree program?
- How do the internships ('Praktika') mentioned in the module book work?  
Is it possible to carry out the 'Forschungspraxis' in a company

➤ Core modules:  
Chose regarding  
your own interest!

You are neither fixed  
to one field nor does  
the choice limit your  
available modules.



# Questions Asked in Advance

## Field 2 – During the Masters

- Can I take courses of XXX? How is YYY represented?
- How to plan your courses for the 4 semesters?

➤ Check out the Module List (found at <https://www.cit.tum.de/en/cit/studies/degree-programs/master-electrical-engineering-information-technology/>)

**Katalog Bioengineering / Neuro**  
**Catalogue Bioengineering / Neu**

EI7473	BioMEMS and Microfluidics
EI70210	Biomolecular Electronics
EI70220	Digital Signal Processing
EI70270	Neuroprosthetics
EI70240	Statistical Signal Processing
EI70250	Systemtheorie der Sinnesorgane*) nicht mit EI70260 belegbar

**Katalog Communications Engineering:**  
**Catalogue Communications Engineering:**

EI70320	Channel Coding	WS/SS	5	3/2/0	COE
EI70330	Data Networking	WS	5	3/1/0	LKN
EI70220	Digital Signal Processing	WS/SS	5	3/1/0	LMT
EI70350	Information Theory				
EI70360	Machine Learning and Optimization				
EI70370	Physical Layer Methods				
EI70380	Signal Processing and Machine Learning				
EI70240	Statistical Signal Processing				

MW1902	Automatisierungstechnik
MW2104	Engineering Methods and Data Management for Mobile and Stationary Mechatronic Systems
EI7310	Batteriesystemtechnik
ED180021	Battery Applications
EI7312	Bewegungssteuerung durch geregelte elektrische Antriebe

EI7263	Biologically-Inspired Learning for Humanoid Robots	SS	6	2/0/2	ICS	m (30%) + m (10%) + l (30%) + HA (30%)	E	3)5)7)9)
CIT3430000	Biomedical Engineering – Diagnostics and Clinical Correlations	WS	5	2/2/0	LBE	s, 90 min (80%) + v (20%)	D/E	3)
CIT4330010	Brain, Mind and Cognition	WS	6	3/0/0	LDV	b (40%) + HA (60%)	E	5)7)9)
EI7411	Channel Codes for Iterative Decoding	SS	5	3/1/0	LNT	s, 90 min	E	6)

EI71106	Introduction to Design, Control and Perception of Aerial Robotics	SS	6	2/2/2/0	RSI	s 120 min (40%) + p (60%)	E	9)
EI71099	Introduction to Human and Robotic Hand Grasping: Control and Manipulation	SS	6	2/2/2/0	RSI	s 90 min (40%) + p (60%)	E	9)
CIT433022	Introduction to Quantum Optics and Applications	WS/SS	5	2/2/0	LTI	m (75%) + ü (25%)	E	6)
CIT4330000	Introduction to Soft Robotics	WS	6	2/0/2	ICS	l (40%), v (20%), m (40%)	E	9)
CIT4430009	Inverse Problems in Electromagnetic Imaging	SS	5	3/1/0	HFT	s 90 min	E	2)
CIT4330009	IoT Security	WS/SS	5	2/2/0	ESI	s (60%) + ü (20%) + 20%)	E	5)
EI7383	Künstliche neuronale Netze zur Identifikation mechatronischer Systeme	WS	6	2/1/1	EAL	s, 90 min	D	
ED160007	Lithium-Ionen-Batterieproduk-	WS	5	2/1/0	SoED	s 90 min	D	

# Questions Asked in Advance

## Field 2 – During the Masters

- What are the best opportunities to study abroad?

TUMexchange + ERASMUS+





# Questions Asked in Advance

## Field 2 – During the Masters

- Is it possible to take courses from other departments, for example informatics?
- Is the master thesis research based?
- Is course taught in german?
- Are there any recommendations about which type of courses to attend in each semester?
- Will we be able to create a real project by working in the laboratory? Are there any projects/robots/systems?

# Questions Asked in Advance

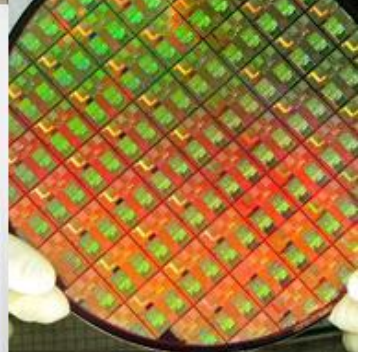
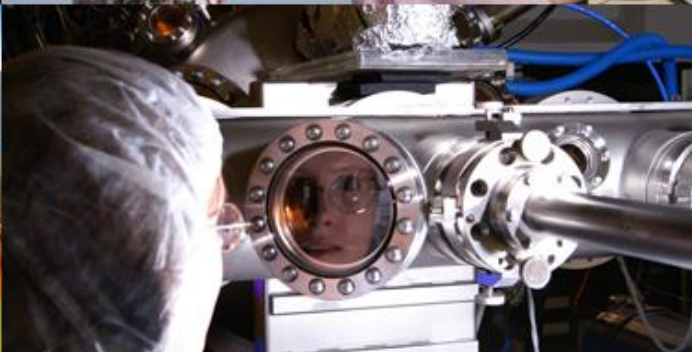
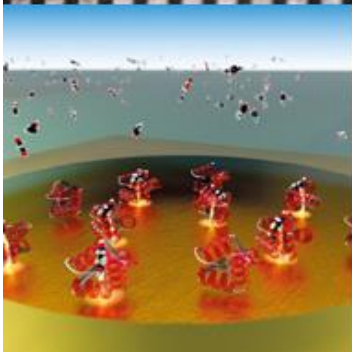
## Field 2 – During the Masters

- Is Working part-time/full-time besides the Master possible
  - What are examples of research topics?
- 
- Working besides the Master:
    - Full-time work can be legally difficult (to the best of my knowledge)
    - Part time work can be possible (heavy workload with a full-time study)
    - Part-time study programs (50% and 66%) are available for the MSEI
  
  - Research Topics:
    - MSEI covers a broad range of Research topics all through the Electrical and Computer Engineering
    - Examples: Nanoelectronics, Circuit Design, Cryptography and Cyber Security, Biomedical, Robotics, Energy Systems, Communication Systems, Neuroengineering, Integrated Electronics, Optoelectronics, Sensors, etc.

# Questions Asked in Advance

## Field 3 – After finishing the Masters

- Which companies and roles are MSEI graduates working in?
  - Job opportunities
    - Fields of work basically spans the same broad range as the research topics.
    - Job Profiles: Research, Development, Production, Planning, Sales, Patent lawyer, Insurances, Management, Consulting, etc.
    - Typical employers: Any kind of Companies, Universities and Research Institutes, Public Authorities, Radio/TV, etc.



# Asking former Students

## Ergebnisse der Befragung

geantwortet haben vor allem Absolvent\*innen der Jahre 2017-2019

- 90% würden wieder den MSEI studieren
- 96% sind aktuell erwerbstätig
  - davon 75% abhängig beschäftigt (>55% bei großen Unternehmen)
  - 17% promovieren
  - 3% sind selbständig



- >80% hatten spätestens 3 Monate nach Abschluss einen Job
- 80% mussten nur 0-5 Bewerbungen schreiben (davon 19% 0 Bewerbungen)

3



40:18



-1:13:02



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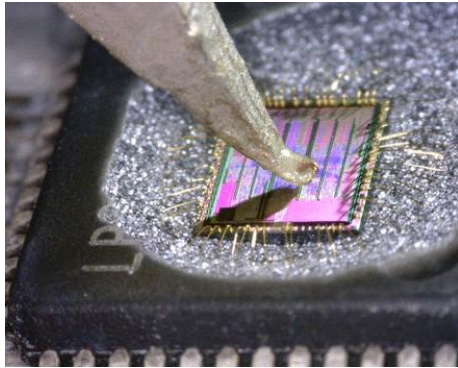
Geschwindigkeit



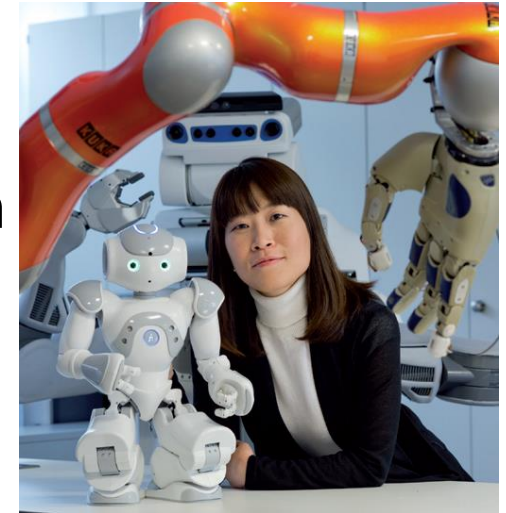
Qualität

**Virtueller Tag der Fakultät EI 2021**  
**Video unter: <https://www.ei.tum.de/tdf/>**

# Job Fields Electrical and Computer Engineer



Medical Engineering  
Robotics  
6G Mobile Communication  
Automotive  
Aerospace  
Artificial Intelligence  
Nanoelektronics  
Sensors  
Renewable Energies  
Cloud Computing  
Gaming  
Embedded Systems



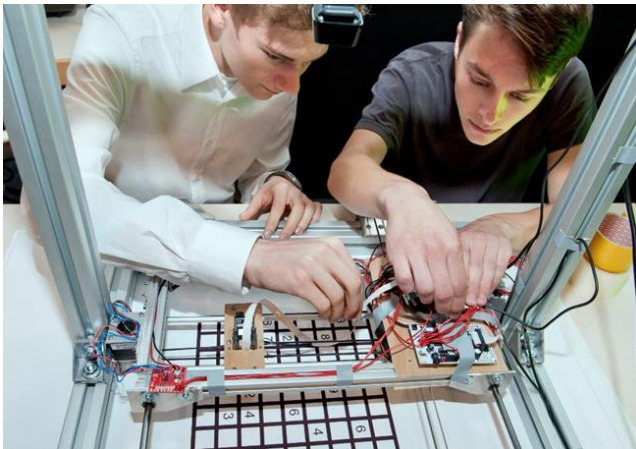
# Additional Opportunities



<https://tumhyperloop.de>



<https://tufast-racingteam.de/>



[https://www.ce.cit.tum.de/lsr/lehre/adv\\_eisor/](https://www.ce.cit.tum.de/lsr/lehre/adv_eisor/)



<https://www.thinkmakestart.com/>

- What is neuroengineering?
- Is it possible to study Master of Neuroengineering without B.Medical Engineering or B. Electrical Engineering?
- Assuming I already took elective courses of neuroengineering during my bachelor's at TUM, can I apply for a higher semester?
- What are the main differences between the three programs?
- Is it possible to make an application for admission to the Neuroengineering program for a higher semester i.e. summer semester?
- Can you do Neuroengineering if you did the bachelor in Electrical engineering and Information Technology?

# MSCE – Master of Science in Communications and Electronics Engineering

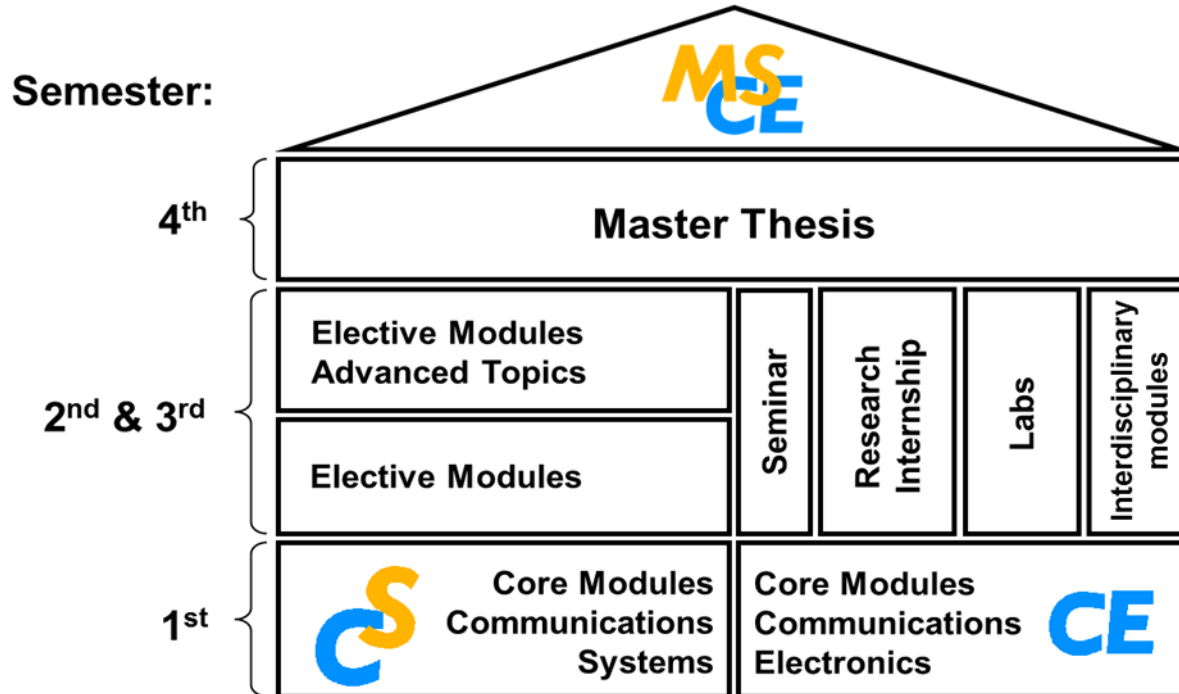
- What are the main differences between the three programs?
- What distinguishes 'MSCE' from Communications Engineering as a core area of MSEI?

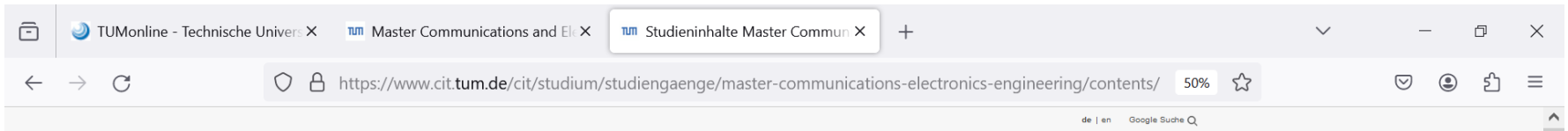


# Questions Asked in Advance

## Field 1 – Prerequisites and Application - MSCE

- How about Language requirements?
- Prerequisites:
  - English language certificate is required
  - No German language skills are required
  - Bachelor Degree with focus on Communications or Electronics Engineering
  - A certain number of ECTS/Credits from the Fields Mathematics, Electrical & Computer Engineering, Communications Engineering
  - Good (very good) grade of the Bachelor
  - Statement of Purpose
  - Letters of Reference
  - Direct Admit, Interview, Direct Rejection
  - Deadline for winter semester 2024/2024: 31th May 2024





- Startseite
- Studium
- Vor dem Studium
- Studiengänge
- Bachelor Bioinformatik
- Bachelor Elektrotechnik Informatik
- Bachelor Informatik
- Bachelor Informatik: Games Engineering
- Bachelor Information Engineering
- Bachelor Mathematik
- Bachelor Wirtschaftsinformatik
- Master Bioinformatik
- Master Biomedical Computing
- Master Communications Electronics Engineering
- Degree Program Contents
- Master Computational Science and Engineering
- Master Data Engineering and Analytics
- Master Elektrotechnik Informatik
- Master Informatik
- Master Informatik: Games Engineering
- Master Information Systems
- Master Mathematik
- Master Mathematical Finance & Actuarial Science

Startseite » Studium » Studiengänge » Master Communications Electronics Engineering » Degree Program Contents

Diese Seite ist nur auf Englisch verfügbar, da die Unterrichtssprache Englisch ist und wir für diesen Studiengang keinen Deutschnachweis fordern.

## Degree Program Contents Master in Communications and Electronics Engineering

### Follow up Guidelines

For orientation in the study program, the following guidelines can be used:

- Communications Systems track: [Core Modules Follow up Modules](#)
- Communications Electronics track: [Core Modules Follow up Modules](#)

### Degree Program Handbook

Students who have started in winter semester 2022/2023 at TUM can download the Degree Program Handbook:

- [Degree Program Handbook WS 2022/2023](#)

### Module List and Module Descriptions

The module list of the MSCE program can be found here:

- [Students who start the program in winter semester 2023/24: Module list MSCE\\_PO2023](#)
- [Students who have started the program before winter semester 2023/24: Module list MSCE\\_PO2016](#) (Module descriptions are available in TUMonline)

### Suggestions for modules for interdisciplinary area:

- German Courses (recommended)
- Language Courses (exempt English)
- Management Courses

### Master's Thesis

Students can start the master's thesis if they have passed 63 credits from course work plus the research internship. For the registration of the master's thesis students have to contact the MSCE office.

Professors from CIT (department Electrical Engineering, Computer Engineering, Computer Science and Mathematics) are allowed to supervise

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**Contact**  
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Tel. +49 89 289 22265

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- Bachelor Informatics: Games Engineering +
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- Master Electrical Engineering and Information Technology** -
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## Electrical Engineering and Information Technology

### Master of Science (M.Sc.)

[Before starting the degree program](#) | [During the degree program](#) | [Contact](#)

The program builds upon students' existing competencies in Electrical Engineering and Information Technology (EI) and covers the spectrum of the academic field in all aspects. Moreover, it offers the opportunity for students to specialize in the following core areas:

- Automation and Robotics
- Bioengineering and Neuroengineering
- Communications Engineering
- Electromagnetics, Microwave Engineering and Measurements
- Electronic Circuits and Systems
- Embedded and Computer Systems
- Microelectronics and Nanoelectronics
- Power Engineering

The focus is on an academic training. Students learn how to research independently in project work and internships. Interdisciplinary modules improve their skills by developing their intercultural, business, social and personal competencies. This opens the door for a career in industry or research for graduates of the master's program in Electrical Engineering and Information Technology.

<b>Key Data</b>	+
<b>How is the program structured?</b>	+
<b>What skills and competencies will I acquire?</b>	+
<b>What career opportunities will I have afterwards?</b>	+
<b>What part-time options are available?</b>	+

#### TUM School of Computation, Information and Technology

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Arcisstraße 21  
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#### Contact

**E-Mail:** [master@ei.tum.de](mailto:master@ei.tum.de)  
**Tel:** +49 89 289 22242

#### Examination Board

#### Student Academic Advising

#### Study Guide

#### Academic and Examination Regulations

#### Module List

[new modules from the SS2024](#)

- **Student Advisory Service EI**
  - Topical questions regarding EI
  - Details about the Courses
  - Dipl.-Ing. Florian Rattei, Valentin Ahrens, M.Sc.:  
[studienberatung@ei.tum.de](mailto:studienberatung@ei.tum.de)
  - MSNE: [msne@ei.tum.de](mailto:msne@ei.tum.de)
  - MSCE: [msce@ei.tum.de](mailto:msce@ei.tum.de)
- **General Student Advisory Services**
  - Information about Prerequisites
  - General Questions regarding Enrollment, Documents, Deadlines
  - Service Desk of the **TUM Center for Study and Teaching**,  
[studium@tum.de](mailto:studium@tum.de) 089/289-22245