Info session M. Sc. Materials Science and Engineering

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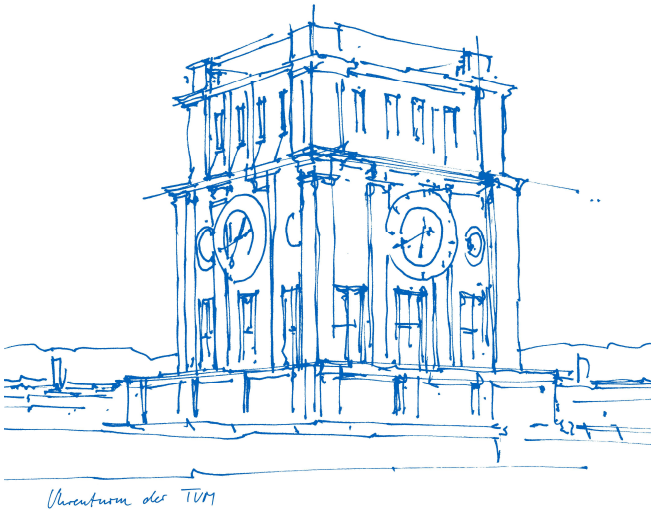
Agenda

- The TU Munich & the TUM School of Engineering and Design

- **M. Sc. Materials Science and Engineering**
  - What is the M. Sc. MS&E all about? / Key data
  - The MS&E‘s curriculum: mandatory modules / electives
  - The MS&E‘s four focus areas
  - MS&E: how to achieve the required 120 credits
  - Where to find what
  - Our wiki as your first point of contact
  - The application process
  - How are applicants selected for admission?



Important note as from the coming winter semester

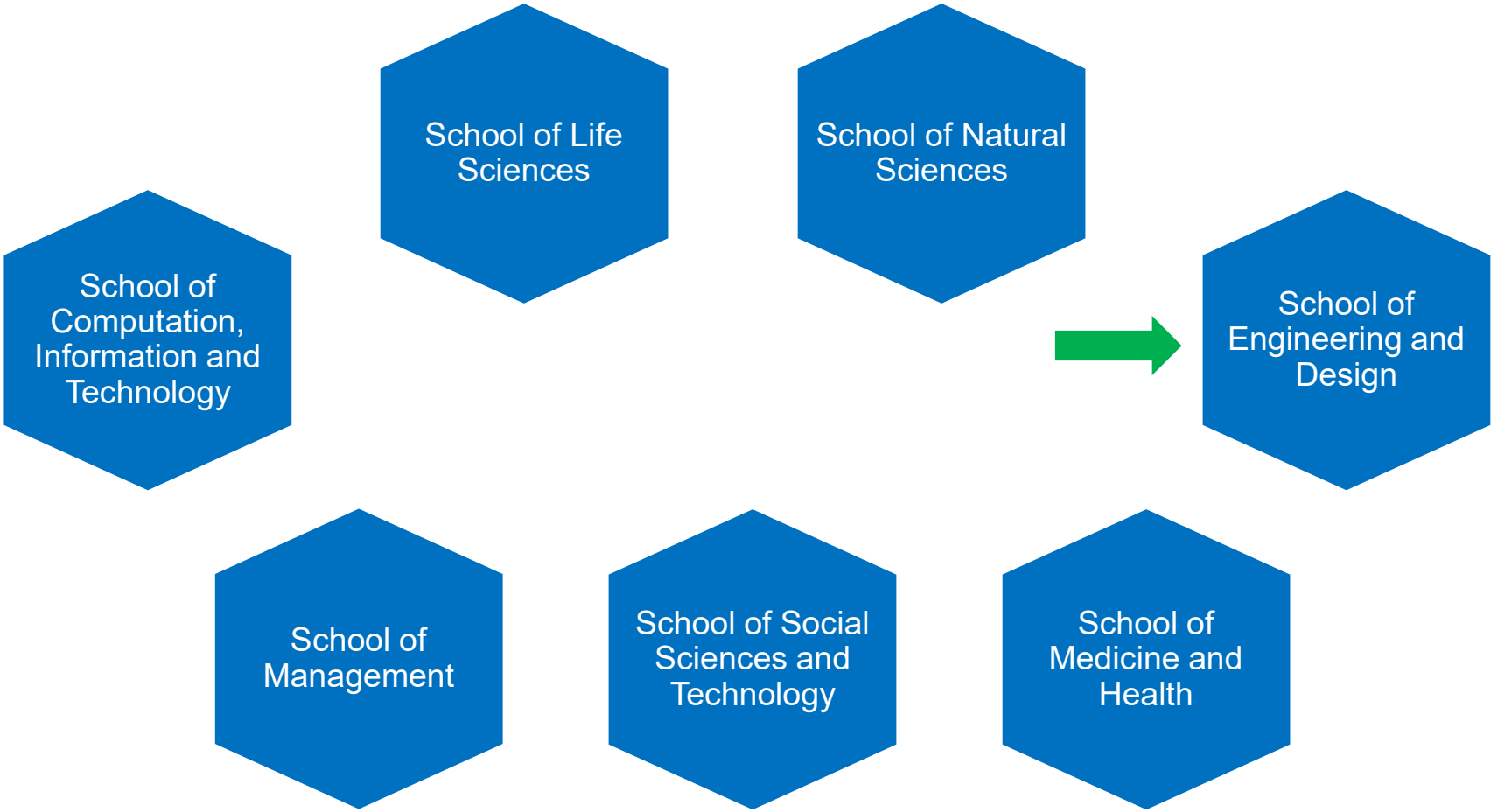
Tuition Fees for Students from Non-EU Countries

At the Technical University of Munich (TUM), tuition fees are charged for international students from third countries who newly enroll in a degree program starting in the winter semester of 2024/25.

https://www.tum.de/en/studies/fees/tuition

The TU Munich &
the TUM School of Engineering and Design

The TU Munich: 7 schools



The TU Munich & the TUM School of Engineering and Design

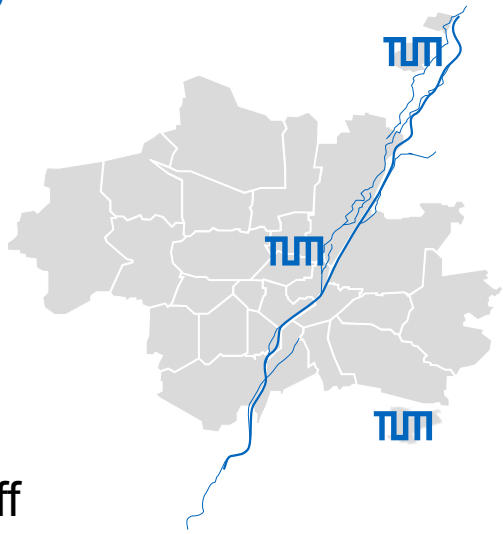
https://www.tum.de/en/studies/during-your-studies/starting-your-studies/masters-days

The TUM School of Engineering and Design

more than 11,000 B. Sc. and M. Sc. students

more than 40 degree programs

approx. 500 non-academic staff members



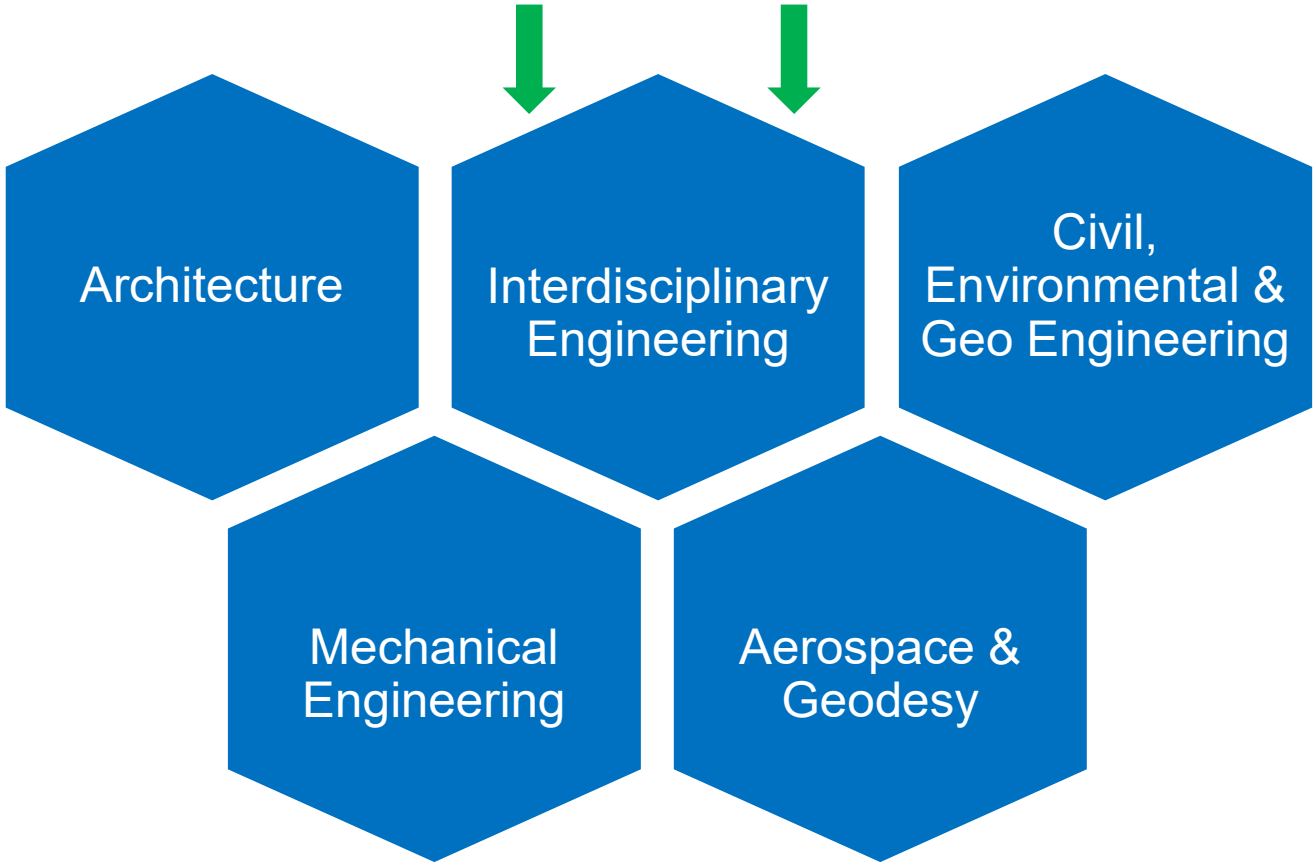
approx. 4,700 newly enrolled students per year (both B. Sc. and M. Sc. students)

approx. 135 professors

approx. 2,000 academic staff members

https://www.ed.tum.de/en/ed/home-1/

The TUM School of Engineering and Design



The TUM School of Engineering and Design

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https://www.ed.tum.de/en/ed/home-1/

The TUM School of Engineering and Design: Interdisciplinary Engineering

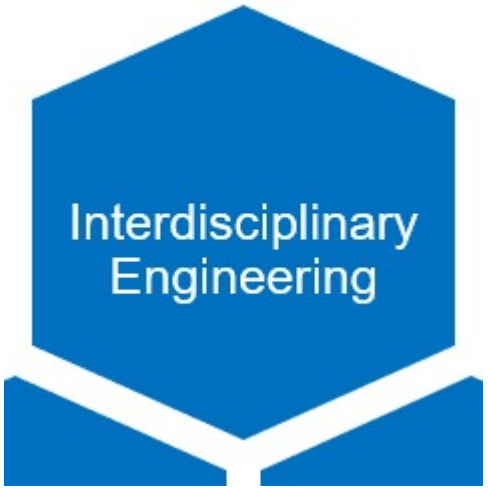
Bachelor degree program:

- B. Sc. Engineering Science

Master degree programs:

- M. Sc. Industrial Biotechnology (IBT)
- M. Sc. Human Factors Engineering (HFE)
- M. Sc. Materials Science and Engineering (MS&E)
- M. Sc. Power Engineering (PE)
- M. Sc. Risk and Safety (R&S)

studium MINT (foundation year/semester)



M. Sc. Materials Science and Engineering

What is the M. Sc. MS&E all about?

Image: Tobias Hase / TUM

- intertwining of expertise in the natural and engineering sciences
- the M. Sc. in MS&E is science- and fundamentals-oriented
- interdisciplinary training
- physically and mathematically model complex technical-physical processes and systems accounting for the materials to be employed

Key data

Academic degree
Master of Science (M. Sc.)

Main locations
Garching & Garching Hochbrück campus as well as the main campus in Munich

Language of instruction
English

Credits
120 credits

Standard period of study
4 semesters (full-time)

M. Sc. Materials Science & Engineering: how to achieve the required 120 credits

MANDATORY	40 CREDITS	Advanced Rheology Materials Sciences (MS&E) Mathematical Modeling of Materials Measurement and Sensor Technology (MS&E) Multiscale Modeling Nonlinear Continuum Mechanics Physics of Fluids Probability Theory and Uncertainty Quantification	ELECTIVES	38 CREDITS	30 credits: elective modules plus 8 credits practical courses **foci:** Multiscale Material Principles Uncertainty Quantification & Mathematical Modeling Materials in Engineering Applications Material Characterization, Testing, and Surveillance	SCIENTIFIC SKILLS	4 CREDITS	ADVANCED RESEARCH	INTERNSHIP	8 CREDITS	THESIS	30 CREDITS

40 credits + 38 credits + 4 credits + 8 credits + 30 credits = **120 credits**

The MS&E‘s four focus areas

During your second and third semester you begin to focus your studies to specialize in one of the following four areas:

- Multiscale Material Principles
- Uncertainty Quantification & Mathematical Modeling
- Materials in Engineering Applications
- Material Characterization, Testing & Surveillance

MS&E: how to achieve the required 120 credits

mandatory/required modules (40 credits):

- cover the core competencies
- 8 modules at 5 credits each

Required Modules		40
[VK] [BGU35016] Advanced Rheology		5
[VK] [PH9031] Materials Sciences (MS&E)		5
[VK] [MA9805] Mathematical Modeling of Materials		5
[VK] [PH9032] Measurement and Sensor Technology (MS&E)		5
[VK] [MW2359] Multiscale Modeling		5
[VK] [MW2368] Nonlinear Continuum Mechanics		5
[VK] [MW2361] Physics of Fluids		5
[VK] [MW2360] Probability Theory and Uncertainty Quantification		5

MS&E: how to achieve the required 120 credits

choice of specialization: as explained beforehand, students are supposed to focus on one of four possible specializations and their corresponding electives – please see your mentor to discuss this during your first semester

- electives I and II (30 credits)
  - a minimum of 15 credits must be obtained from the electives I of your chosen specialization
- practical courses (8 credits)
  - a minimum of 4 credits must be obtained from the practical courses of your chosen specialization

MS&E: how to achieve the required 120 credits

Advanced Research Internship (8 credits)

Advanced Research Internship	8
[VK] [SE0208] Advanced Research Internship (ARI)	8

Advanced Research Internship (ARI) in Germany or abroad [SE0208]

- Students will be supported by their mentor when pursuing their ARI. The internship can be completed at the TUM, another university or a research institution cooperating with the TUM, and it can be completed either in Germany or abroad.
- The ARI should be pursued during the 3rd semester, ideally to prepare for the Master's Thesis.
- The form for ARI registration and evaluation can be found on the page Dokumente / Documents – M.Sc. MSE
- The description of the module can be found here.
- Partial financing is possible for internships abroad within Europe through the ERASMUS program

MS&E: how to achieve the required 120 credits

Scientific skills (4 credits) - to be chosen from a list of courses offered at the TU Munich

Scientific Skills		4
[VK] [WI000264] Project Management		6
[VK] [ED0141] Logic		5
[VK] [IN2270] BGCE Ferienakademie		4
[VK] [SZ0330] German for Engineers B2		3
[VK] [SZ0429] English - English for Scientific Purposes C1		3
[VK] [SZ0471] English - Intensive Thesis Writers' Workshop C2		3
[VK] [SZ0425] English - Introduction to Academic Writing C1		3
[VK] [SZ0453] English - Scientific Presentation and Writing C2		3
[VK] [SZ0406] English - Writing Academic Research Papers C2		3
[VK] [CLA20710] Global Diversity Training		2
[VK] [SE1005] Intercultural Competencies		2
[VK] [CLA20267] Communication and Presentation		2
[VK] [MW1535] Introduction to Patent, Trademark and Design Law for Engineers		3
[VK] [PH6003] Presentation Skills for Natural Scientists		1
[VK] [MW0219] Project Management for Engineers		3
[VK] [MW2223] Soft Skill Trainings in Project Cooperations		2
[VK] [CLA30622] From Invention to Patent		3

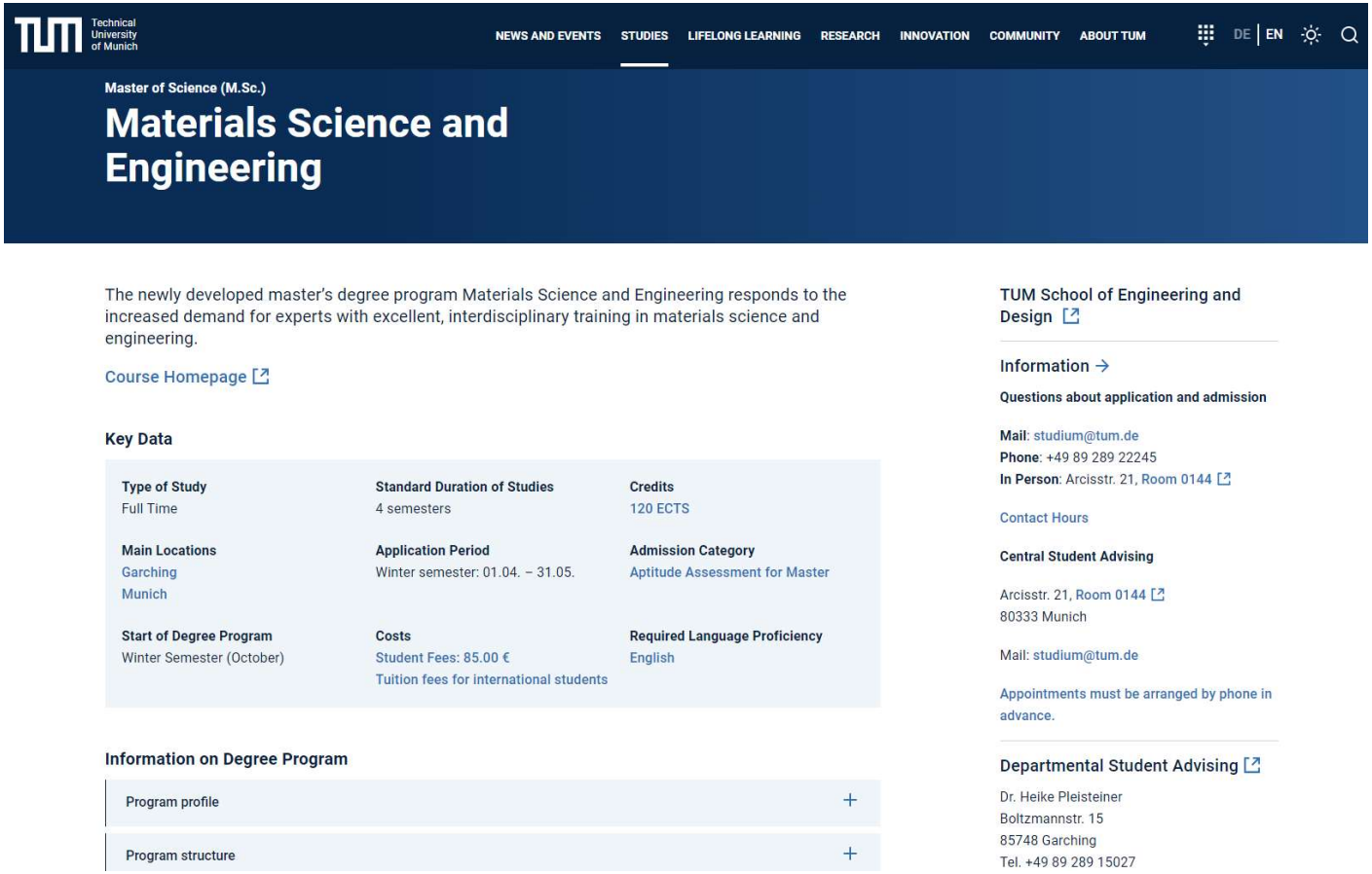
MS&E: how to achieve the required 120 credits

Master Thesis (30 credits)

Master's Thesis			30
[VK] [SE0207] Master's Thesis and Colloquium			30
[VK] Master's Thesis		4.	
[VK] Colloquium		4.	

Where to find what

The pages provided by the TU Munich:
https://www.tum.de/en/studies/degree-programs/detail/materials-science-and-engineering-master-of-science-msc

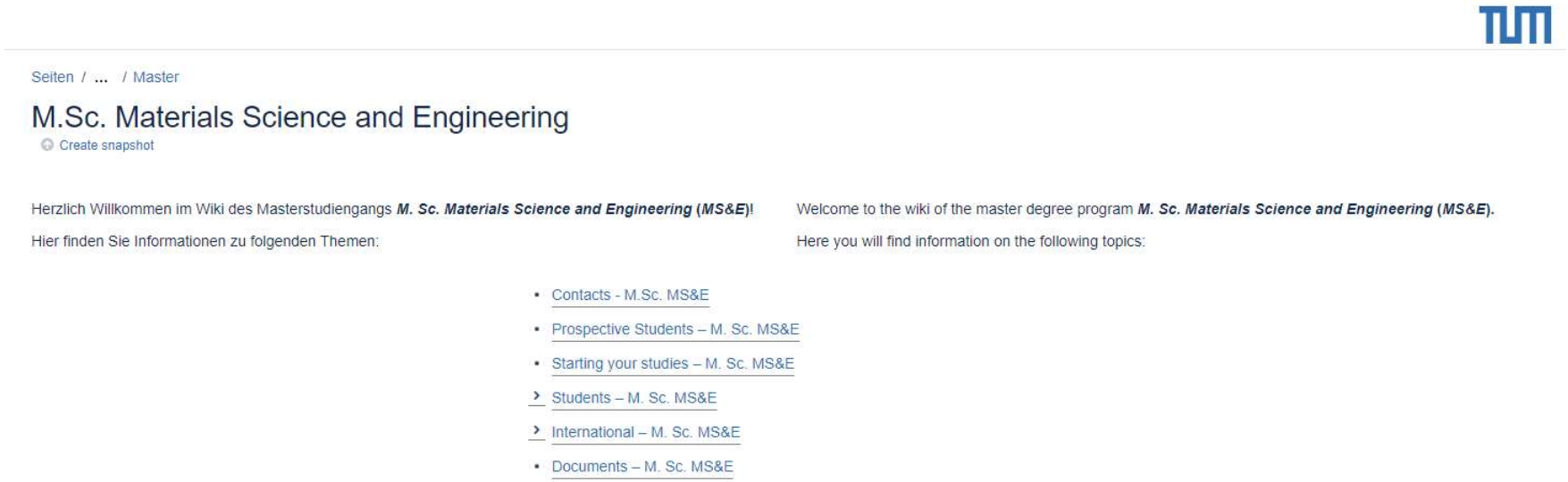


Where to find what

The School of Engineering and Design‘s website:
https://www.ed.tum.de/en/ed/studies/degree-programs/materials-science-and-engineering-m-sc/

Where to find what

Our wiki:
https://wiki.tum.de/display/edschooloffice/M.Sc.+Materials+Science+and+Engineering



Seiten / ... / Master

M.Sc. Materials Science and Engineering

Create snapshot

Herzlich Willkommen im Wiki des Masterstudiengangs ***M. Sc. Materials Science and Engineering (MS&E)***!

Hier finden Sie Informationen zu folgenden Themen:

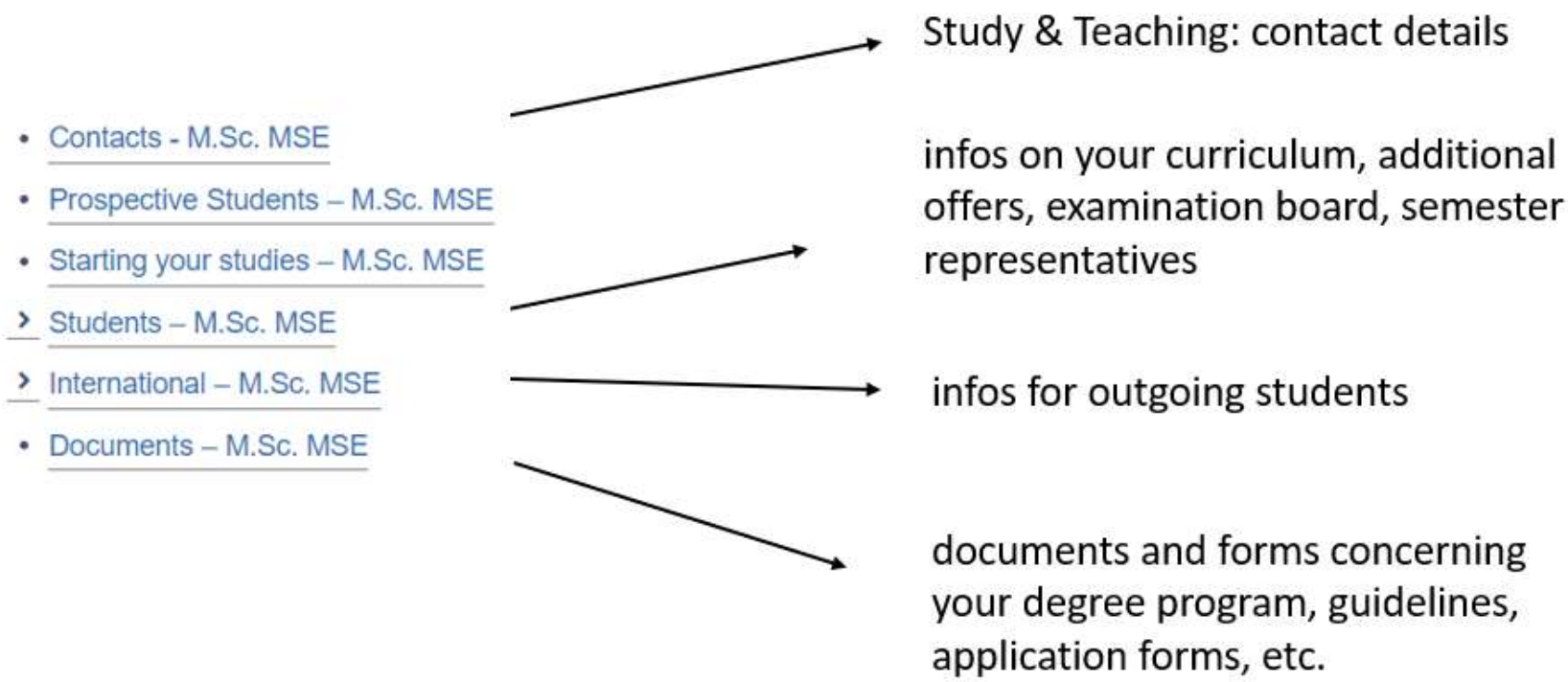
Welcome to the wiki of the master degree program ***M. Sc. Materials Science and Engineering (MS&E)***.

Here you will find information on the following topics:

- Contacts - M.Sc. MS&E
- Prospective Students – M. Sc. MS&E
- Starting your studies – M. Sc. MS&E
- Students – M. Sc. MS&E
- International – M. Sc. MS&E
- Documents – M. Sc. MS&E

Our wiki as your first point of contact

Our wiki:
https://wiki.tum.de/display/edschooloffice/M.Sc.+Materials+Science+and+Engineering



Your application: key facts

Start of the degree program
intake only once a year, i. e. for the winter semester (in October each year)

Application period for the winter semester
1 April through to 31 May each year

Admission category
aptitude assessment for the TU‘s master degree programs

Required language proficiency
English

Your application: key facts

Minimum requirements to apply for a master degree program at the TU Munich

a recognized undergraduate degree (e. g. a bachelor‘s degree) + successfully completing the aptitude assessment procedure

How do I apply?

you apply through the TUMonline application portal (which is only open during the application period)

Which prerequisites do I have to fulfill?

a bachelor's degree of at least six semesters, obtained at a German or foreign university (or an equivalent qualification)

Which subjects regarding my undergraduate degree are suitable?

Engineering Science, *Civil Engineering*, *Mechanical Engineering*, *Electrical Engineering*, *Computer Engineering*, *Physics*, *Materials Science* etc.

Your application: which documents you need to submit during the online application procedure

Degree certificate and diploma or subject and grade transcript of studies to date

other degrees such as a master‘s degree or diploma can also qualify you for our master degree program

Transcript of records (ToR)

the TOR is listing all your successfully accomplished modules and corresponding grades

Proof of English language proficiency

for more detailed information on which forms of verification of language skills are required please refer to https://www.tum.de/en/studies/application/application-info-portal/admission-requirements/language-certificates

Abstract (of your bachelor‘s thesis) in English

Your application: which documents you need to submit during the online application procedure

Curricular analysis listing your best 120 credits

content and results of prior examinations and modules accomplished

Letter of Motivation (in English)

describing both your academic and personal motivation for your choice of degree program

Complete and current CV/résumé

Passport (or, for German nationals, German identification card (*Personalausweis*))

Please note that you may omit (black out) the issuing authority, serial number, and identification number.

Your application: which documents you need to submit during the online application procedure

Preliminary documentation (so-called *VPD*) from uni-assist

This is mandatory if you obtained you bachelor‘s degree outside the EU or Switzerland.

Special requirements may apply depending on your educational background

We may require additional documents if you obtained your bachelor‘s degree in certain countries. Please refer to https://www.tum.de/en/studies/application/application-info-portal/special-conditions-for-certain-countries for more details.

How are applicants selected for admission?

The aptitude assessment test: a two-part procedure

Once you have officially submitted your application including all the required documents the department and professors will check whether your application meets the specific requirements to be admitted to the *M. Sc. in Materials Science and Engineering*.

Part one

In the initial stages, your grades and submitted documents will be evaluated according to a certain point system.

Applicants with excellent or good results will be admitted directly.

Applicants with bad results regarding the points obtained will be rejected at stage one.

Candidates with unclear results will be invited for an interview.

How are applicants selected for admission?

Part two

In part two of the aptitude assessment procedure you will be invited to a 20-minutes admission interview. Whether you will be admitted in the end depends on both your grades from your bachelor‘s degree as well as the outcome of the interview.

When are the interviews held?

The interviews will be held during the summer (July/August). Please note that the master degree program *M. Sc. Materials Science and Engineering* only has an intake for the winter semester.

Regarding your motivation

- You are looking for an interdisciplinary degree program focusing on the natural sciences, in particular maths, physics and chemistry
- You are particulary interested in maths and a lot of theory
- You are looking for a degree program studying in small and highly international groups of students

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We shall look forward to receiving your application.

Thank you for your attention.