

Info session M. Sc. Materials Science and Engineering

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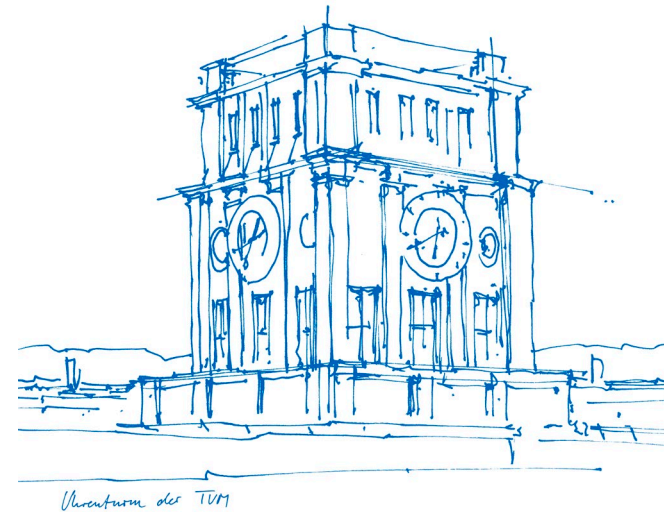
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Agenda

- 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 for international students

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>

Waiver scholarships, exemptions and waivers for international students

for persons who are required to pay tuition fees

Waiver scholarships

for particularly high-achieving and needy students

(in the amount of the tuition fees, no payment is being made)

Exemption from tuition fees

possible under certain circumstances: for students

- in cooperative study programs
- with an established domestic connection
- during a leave of absence
- with a disability
- in ongoing asylum proceedings with a special protection quota

Waiver of fees

for financial, personal or social reasons

<https://www.tum.de/en/studies/fees/tuition/scholarships-and-waivers>

Scholarships

TUM:

- [Scholarship Deutschlandstipendium](#)
 - **For:** currently enrolled undergraduates and graduates with university entrance certificates from Germany or abroad
 - (€ 300 per month)
- [Scholarship for International Students](#)
 - **For:** currently enrolled undergraduates and graduates with non-German university entrance certificates
 - (one-time financial aid of € 500 to € 1500 per semester)
- [Oskar Karl Forster Scholarship for books and learning materials](#)
 - **For:** currently enrolled undergraduate and graduate students who have completed at least two semesters at TUM
 - (Grants for books and learning materials from € 100 to € 500)

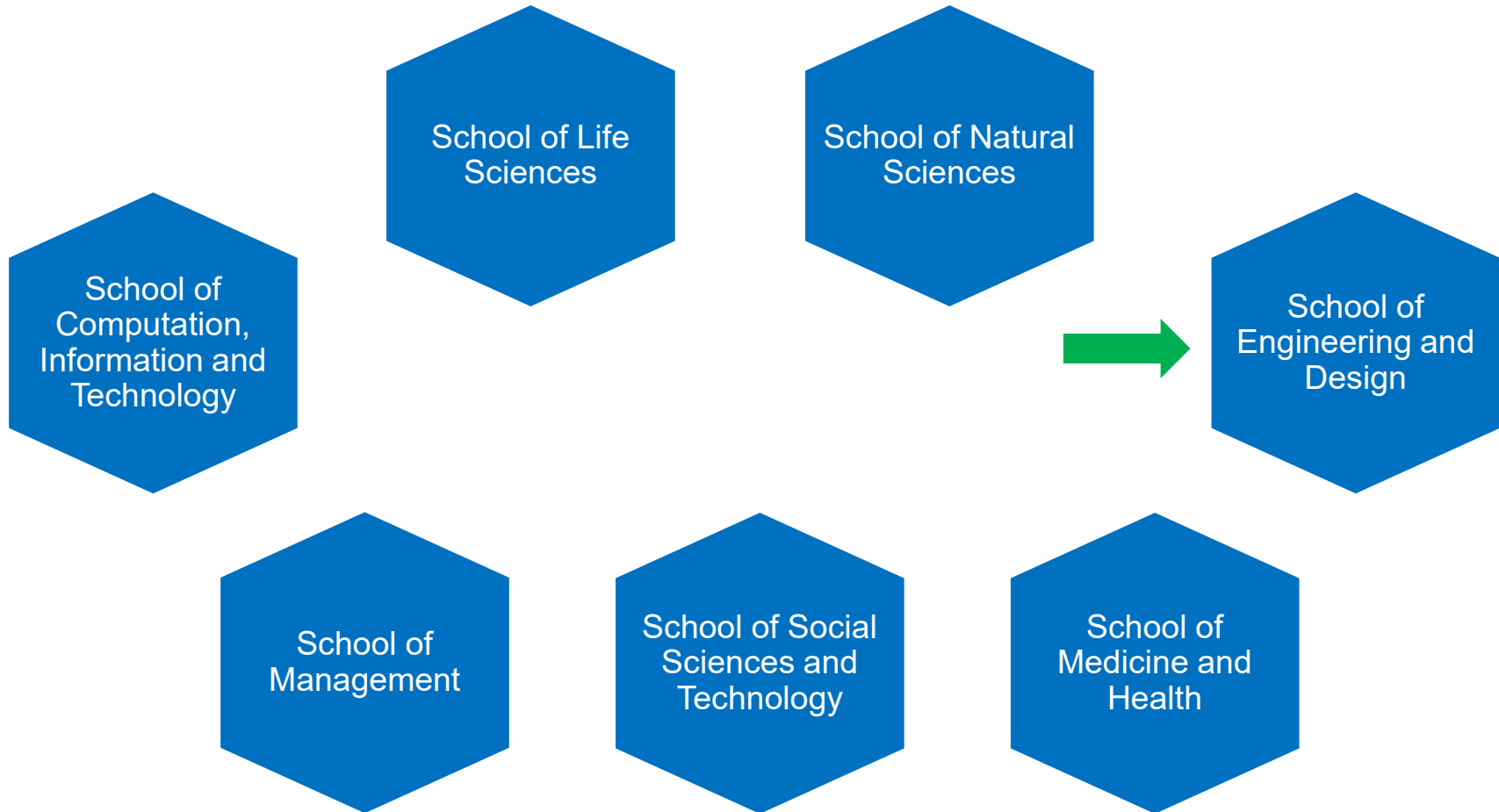
External:

- [Stipendium Plus](#)
 - Grants for gifted students supported by the Federal Ministry of Education and Research
 - (usually € 300 + up to € 855 **depending on income and parents**, similar to BAföG)
- [mystipendium.de](#)
 - FREE database of private companies with more than 1,200 funding opportunities
- [european-funding-guide.eu](#)
 - Scholarship database within Europe

<https://www.tum.de/en/studies/fees-and-financial-aid/scholarships>

The TU Munich & the TUM School of Engineering and Design

The TU Munich: 7 schools



The TUM School of Engineering and Design



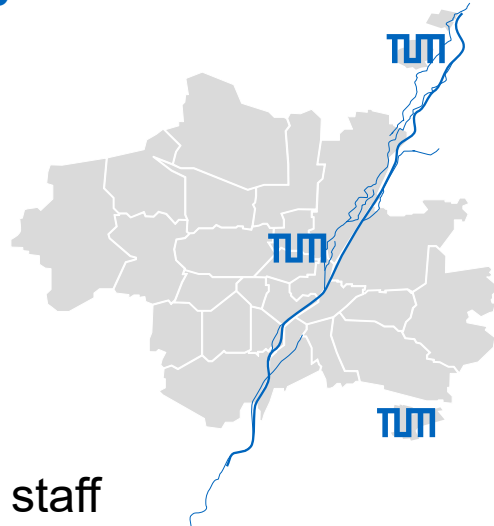
more than 13,000
B. Sc. and M. Sc.
students



more than 40
degree programs



approx. 500
academic support staff
members



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



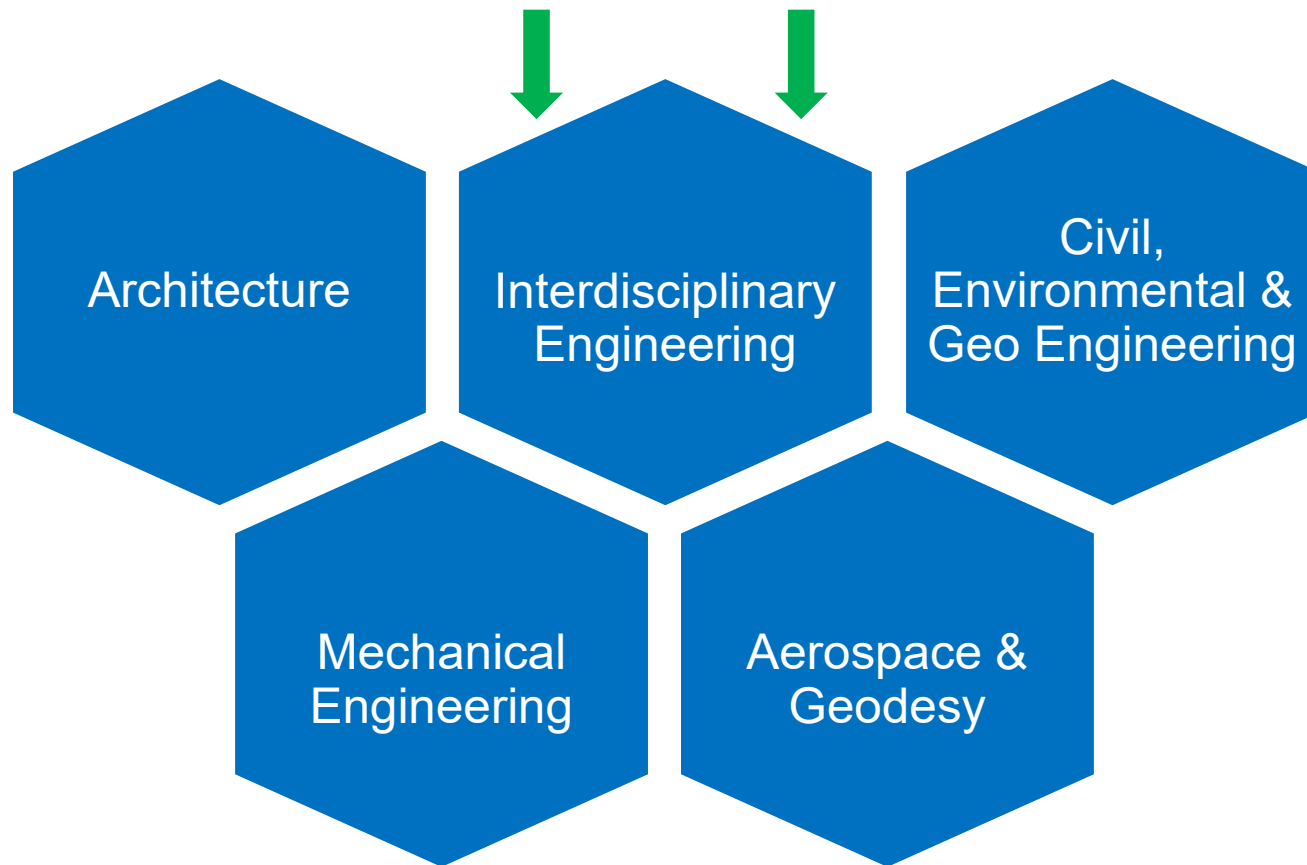
currently **approx. 133**
professors



approx. 1,700
academic staff
members

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

The TUM School of Engineering and Design



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 primarily science- and fundamentals-oriented including interdisciplinary training
- the program will enable you to 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	ELECTIVES	38 CREDITS	30 credits: elective modules plus 8 credits: practical courses 4 focus areas: 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
		Materials Science (MS&E)									
		Mathematical Modeling of Materials									
		Nonlinear Continuum Mechanics									
		Multiscale Modeling									
		Measurement and Sensor Technology (MS&E)									
		Physics of Fluids									
		Probability Theory and Uncertainty Quantification									

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 will begin to focus your studies and 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 choose one of four possible focus areas and their corresponding electives – please see your mentor to discuss this towards the end of your first semester

electives I and II (30 credits)

a minimum of 15 credits must be obtained from the electives I of your chosen focus area

practical courses (8 credits)

a minimum of 4 credits must be obtained from the practical courses of your chosen focus area

☐	■	Elective Modules in Study Lines	38	1
	■	Selection of Study Line		1
	☐			
☐	■	[VK] [E1_MMP] Multiscale Material Principles (Electives I)		1
☐	■	[VK] [E1_MCTS] Material Characterization, Testing & Surveillance (Electives I)		1
☐	■	[VK] [E1_MiEA] Materials in Engineering Applications (Electives I)		1
☐	■	[VK] [E1_UQaMM] Uncertainty Quantification and Mathematical Modeling (Electives I)		1
	☐			
☐	■	[VK] [E2_IE] Individuell Electives (Electives II)		1
☐	■	Wahlbereich Praktika	8	1

MS&E: how to achieve the required 120 credits

Advanced Research Internship (8 credits)

☰	Advanced Research Internship	↗	8	1
☰	[VK] [SE0208] Advanced Research Internship (ARI)	↗	8	1

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

e. g.

Course ID	Course Name	Credits
[VK] [W1000264]	Project Management	6
[VK] [ED0141]	Logic	5
[VK] [SOT86097]	Aligning Generative AI to Social Values (3 ECTS)	3
[VK] [IN2270]	BGCE Ferienakademie	4
[VK] [SZ0349]	German as a Foreign Language C1 - Communication in Companies	3
[VK] [SZ0346]	German as a Foreign Language C1.2: Communicating Professionally in Science and Business	3
[VK] [SZ0330]	German for Engineers B2	3
[VK] [SZ0331]	German for Engineers C1	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] [POL60900]	Information Technologies, Protest, and Conflict	6
[VK] [MCTS0053]	Intercultural Communication	3
[VK] [SE1005]	Intercultural Competencies	2
[VK] [SOT86084]	Introduction to Business Law	6
[VK] [CLA20267]	Communication and Presentation	2
[VK] [CLA11313]	Conflict Management and Conducting Discussions	1
[VK] [SOT86066]	Machine Learning and Society (3 ECTS)	3
[VK] [MW1535]	Introduction to Patent, Trademark and Design Law for Engineers	3
[VK] [CLA21114]	Perspectives of Technology Assessment	2
[VK] [POL00011]	Politics for Rocket Scientists: An Introduction to Political Science for Non-Political Scientists	6
[VK] [PH6003]	Presentation Skills for Natural Scientists	1
[VK] [MW0219]	Project Management for Engineers	3
[VK] [SOT86080]	Risk & Crisis Communication (6 ECTS)	6
[VK] [ED100051]	Self-Management - Coping with Stress and Building your own Resilience	2
[VK] [SOT86083]	Start-up Skills - Legal Fundamentals	6
[VK] [SOT86085]	Sustainable Transitions	6

MS&E: how to achieve the required 120 credits

Master Thesis (30 credits)

	Master's Thesis   		30
	 [ED100053] Master's Thesis Materials Science and Engineering  		30
 			
	 Master's Thesis Materials Science and Engineering  	-	30

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>

The screenshot shows the TUM website interface for the Master of Science (M.Sc.) Materials Science and Engineering program. The header includes the TUM logo and navigation links: NEWS AND EVENTS, STUDIES, LIFELONG LEARNING, RESEARCH, INNOVATION, COMMUNITY, ABOUT TUM, and language options DE | EN. The main heading reads "Master of Science (M.Sc.) Materials Science and Engineering".

The main content area contains the following information:

The newly developed master's degree program Materials Science and Engineering responds to the increased demand for experts with excellent, interdisciplinary training in materials science and engineering.

[Course Homepage](#)

Key Data

Type of Study Full Time	Standard Duration of Studies 4 semesters	Credits 120 ECTS
Main Locations Garching Munich	Application Period Winter semester: 01.04. – 31.05.	Admission Category Aptitude Assessment for Master
Start of Degree Program Winter Semester (October)	Costs Student Fees: 85.00 € Tuition fees for international students	Required Language Proficiency English

Information on Degree Program

- [Program profile](#) +
- [Program structure](#) +

TUM School of Engineering and Design [↗](#)

General Student Advising & Student Information [→](#)

Questions about application and admission

✉ studium@tum.de
☎ +49 89 289 22245
📍 Arcisstr. 21, Room 0144 [↗](#)

Contact hours

General Student Advising

Appointments by arrangement in advance [↗](#)

Departmental Student Advising [↗](#)

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☎ +49 89 289 15027
📍 Boltzmannstr. 15, 85748 Garching

Online application [→](#)

Where to find what

The ED's (School of Engineering and Design's) website:

<https://www.ed.tum.de/en/ed/studies/degree-programs/materials-science-and-engineering-m-sc/>

TUM School of Engineering and Design
Technical University of Munich

- Home
- Studies**
- Before Studying
- Studies
- Degree Programs**
- Aerospace B. Sc.
- Aerospace M. Sc.
- Aerospace Engineering M. Sc. (GIST/TUM-Asia Singapur)
- Architecture B. A.
- Architecture M. A.
- Automotive Engineering M. Sc.
- Civil Engineering B. Sc.
- Civil Engineering M. Sc.

Home > Studies > Degree Programs > Materials Science and Engineering M. Sc.



Image: Tobias Hase / TUM

Materials Science and Engineering M. Sc.

Contact

Student Advising
Dr. Heike Pleisteiner
[msscse\(at\)ed.tum.de](mailto:msscse(at)ed.tum.de)

International Affairs Delegate
Dr. Markus Eblenkamp
[international.ie\(at\)ed.tum.de](mailto:international.ie(at)ed.tum.de)

Phone numbers and office hours: see [Wiki](#)

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:

- [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](#)

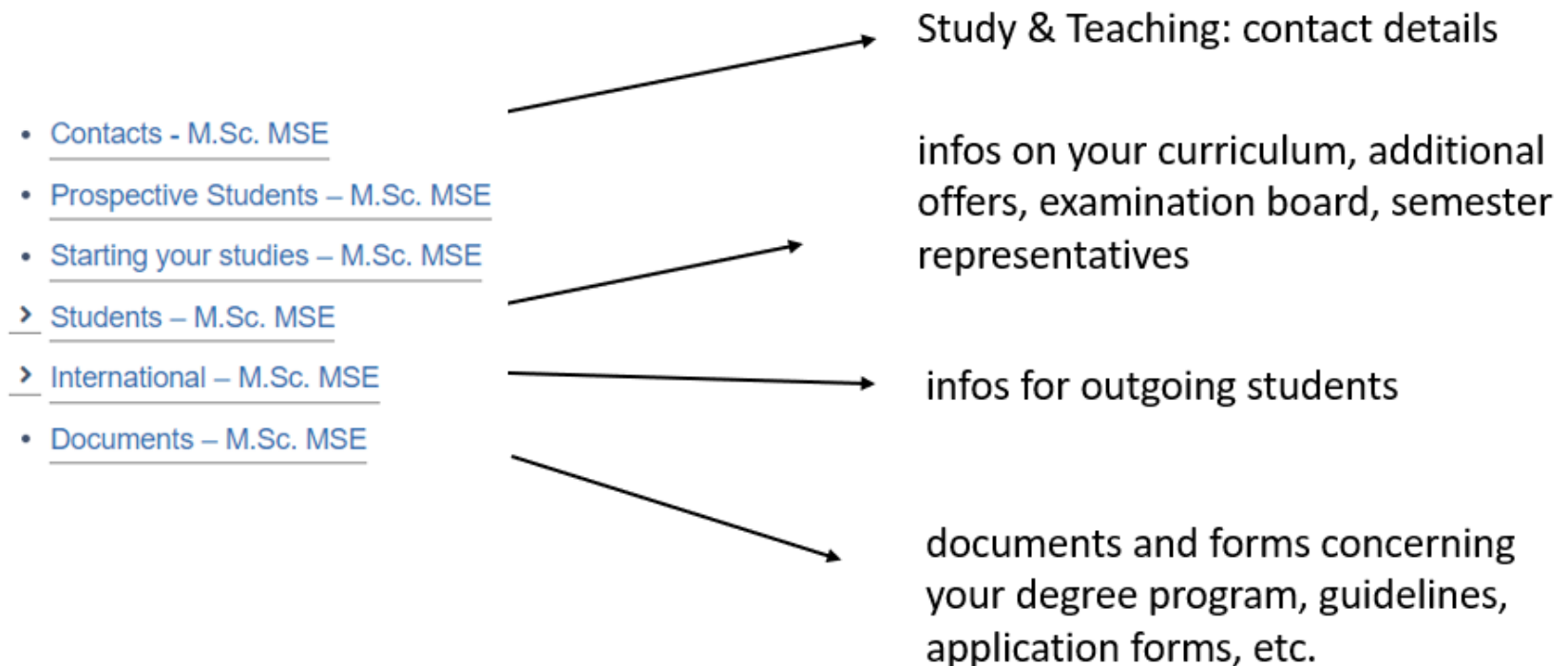
Welcome to the wiki of the master degree program **M. Sc. Materials Science and Engineering (MS&E)**.

Here you will find information on the following topics:

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

Copy of your passport (or, for German nationals, your 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 review documentation (so-called *VPD*) from uni-assist

is required for a Master's entrance qualification (e. g. Bachelor's degree) that was not obtained in Germany

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 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 particularly interested in maths and a lot of theory
- You are looking for a degree program studying in a small and highly international group of students



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©Uli Benz / TU Munich

We will look forward to receiving your application.
Thank you for your attention.

Additional info following the Q&A session

- Regarding the GRE or GATE test, please refer to §36 of the academic and examination regulations:

§ 36 Eligibility Requirements

- (1) Eligibility for the Master's Program in Materials Science and Engineering is demonstrated by:
 1. a qualified bachelor's degree obtained after a program of at least six semesters from a domestic or foreign institution of higher education, or at least an equivalent degree in engineering, mechanical engineering, electrical engineering, informatics, civil/environmental engineering, chemical engineering or a comparable degree program.
 2. proof of expertise in the form of a "Graduate Record Examination (GRE) General Test" or a "Graduate Aptitude Test in Engineering" (GATE) for applicants who have completed a bachelor's degree in the following countries: Bangladesh, China, India, Iran, Pakistan; for other applicants who completed a bachelor's degree in a state that has not signed the Convention on the Recognition of Qualifications concerning Higher Education in the European Region from 11 April 1997 (Lisbon Recognition Convention), we recommend submitting the test as it will be requested later if there are significant differences in terms of the competencies gained in the bachelor's degree in accordance with Section 2; this proof is not necessary for degrees that were completed in signatory states of the Lisbon Recognition

Additional info following the Q&A session

- Regarding the proof of English language proficiency, please refer to <https://www.tum.de/en/studies/application/application-info-portal/admission-requirements/language-certificates> as well as §36(1) 3. of the academic and examination regulations:

3. adequate knowledge of the English language; students whose language of instruction is not English must demonstrate proficiency through an acknowledged language test such as the Test of English as a Foreign Language (TOEFL) (with a minimum of 88 points), the International English Language Testing System (IELTS) (with a minimum of 6.5 points), or the Cambridge Main Suite of English Examinations; if, in the undergraduate program, at least 8 credits were obtained for examinations administered in English-language examination modules, adequate proficiency in English is also deemed proven, alternatively the proof of a bachelor's thesis written in English or a comparable pass/fail credit requirement amounting to 8 credits can be provided.

Additional info following the Q&A session

- Regarding the points awarded for your grade please refer to appendix 2, 5.1.1b) of the academic and examination regulations:

b) Grade

¹Three points are awarded for every tenth of a grade higher than 2.5 of the average calculated with examination requirements for the modules that are taken into account for the subject-specific qualification according to 5.1.1 a). ²The maximum number of points is 45. ³Negative points will not be awarded. ⁴If modules amounting to more than 120 are taken into consideration for the discipline-specific specific skills and qualifications according to 5.1.1 a), only the best modules amounting to 120 credits will be used to calculate the grade; if there were modules amounting to less than 120 credits for the discipline-specific specific skills and qualifications according to 5.1.1 a), the grade will be calculated using the lower credit number. ⁵If no modules to be taken into consideration in accordance with 5.1.1 a), no points will be awarded for the grade. ⁶Grades of international degrees will be converted by applying the Bavarian formula. ⁷The applicant needs to submit a list of the required modules together with the application and confirm its accuracy in writing. ⁸The grade weights of the individual modules correspond to the credits assigned to each module. ⁹If the candidate submits this list, the average is calculated according sentences 1 to 6. ¹⁰If the candidate has submitted a degree certificate containing more than 120 credits with the application, the assessment will be made on the basis of the best graded modules in the amount of 120 credits that are to be taken into consideration in accordance with 5.1.1 a).