

During your studies

Getting started

Onboarding

Curriculum and Teaching Offers

Curriculum Overview

In the following, we list the compulsory and elective subjects available in COME.

You will need to pass

- 36 credits of compulsory modules,
- 24 credits of core-elective modules,
- 27 credits of technical electives (out of which 10 can be chosen as individual electives),
- 3 credits of general education modules, and
- 30 credits for the Master's thesis.

Required Modules

All of the following six modules have to be successfully passed. Please note that you have to have passed one of the following modules after the second semester.

Module Number	Module Title	Semester	Credits
BV320016	Finite Element Methods 1	1.	6
BGU44013T2	Computation in Engineering 1	1.	6
BV330009	Computational Material Modeling 1	1.	6
BV020001	Continuum Mechanics	1.	6
BGU41021	Advanced Fluid Mechanics	1.	6
BV030004	Software Lab	2. & 3.	6

Core Elective Modules

We offer the two core elective catalogues 'Mechanics' and 'Computation' with four elective subjects each. You have to pass two modules out of each of the catalogues.

Mechanics

Module Number	Module Title	Semester	Credits
BGU41028	Computational Fluid Dynamics	2.	6
BV430008	Structural Dynamics	2.	6
BGU32033	Theory of Plates and Shells	1. & 2. (*)	6
BV330010	Computational Material Modeling 2 (**)	3.	6

Computation

Module Number	Module Title	Semester	Credits
BGU32026	Finite Element Methods 2	2.	6
BGU44017	Functional Analysis and Computational Linear Algebra (****)	3. (not in winter 25/26)	6
BGU65014	Ar Computational Mechanics (***)	2.	6
BV320017	Optimization (**)	3.	6

(*) The part **Theory of Plates** can also be taken in the third semester, however, we recommend taking it in the first semester for didactic reasons.

The exam is conducted as a **single exam covering both parts**. You have to make sure to register for exam BGU32033. It's not possible to take the two parts separately.

The exams BGU32027P1 and BGU32027P2 are not valid for students who started their studies in 2021 or later.

(**) These modules consist of two lectures. If you want to include these modules in your electives, make sure to register for the corresponding exam. It's not possible to account for this module by passing the individual subjects.

If you're in doubt about these regulations, please do not hesitate to contact us at [come\(at\)tum.de](mailto:come(at)tum.de).

(***) Interested students are welcome to join the [Python course for engineers and](#) (LV-Nr: 0000003544) offered by Dr. Jithender Timothy in the lecture-free

period before the summer and winter term.

This will help you in the lectures and tutorials on **AI in COME**. No credits can be offered, however, a certificate will be issued for each participant completing the course.

Participation is highly recommended.

For further questions about the course, please contact Dr. Timothy (jithender.timothy@tum.de).

(****) Not offered in the winter semester 2025/26 due to the cancellation of the lecture on *Computational Linear Algebra*. You can include the subject *Introduction to Functional Analysis (BV/COME)* in your electives catalogue.

Technical Elective Modules

The list of elective subjects is continuously updated. Below, we sort the elective subjects by chair.

Computational Modeling and Simulation/Computing in Civil and Building Engineering

Module Number	Module Title	Semester	Credits
BGU44014T2	Computation in Engineering 2 (self study, *)	Summer	6
BV030011	Computational Linear Algebra (if not taken as comp.el.)	Winter	3
ED130085	Industrial Applications of Structural Mechanics, Dynamics and Multiphysics I	Summer	3
ED130086	Industrial Applications of Structural Mechanics, Dynamics and Multiphysics II	Winter	3
BV030012	Engineering Databases	Winter	3
BV650003	Professional Software Development	Summer	3
BGU65009	Ar	Summer	3

(*) Please contact Vijaya Holla (vijaya.holla@tum.de) in case you are interested to this course on a self-study basis. He will enroll you into the corresponding Moodle-course.

Computational Solid Mechanics

Module Number	Module Title	Semester	Credits
BGU33011	Computational Mechanics for Car Body Design	Summer	3
BV330003	Computational Plasticity (*)	Winter	3
BV330008	Explicit FEM and Transient Analysis	Summer	3
BV330004	Fracture and Damage (*)	Winter	3
BV330001	Structural Optimization 2 (*)	Winter	3

(*) If not taken as part of a core elective module.

Engineering Risk Analysis Group

Module Number	Module Title	Semester	Credits
BGU60018	Estimation of Rare Events and Failure Probabilities	Summer	3
BGU60020	Risk Analysis	Winter	6
BGU60021	Risk Assessment and Reliability of Engineering Systems	Summer	6
BV600019	Stochastic Finite Element Methods	Winter	6
BGU60024	Seminar on Elements of Machine Learning	Winter	3
ED130013	Prognostics and Health Management	Summer	3

Hydromechanics

Module Number	Module Title	Semester	Credits
BGU41019	Modeling and Simulation of Turbulent Flows	Summer	6
BV040053	Computational Fluid Dynamics (*)	Summer	6
BV410004	Fluid Mechanics Lab	Winter	3

(*) If not taken as a core elective module.

Structural Analysis and Dynamics

Module Number	Module Title	Semester	Credits
BV010010	Advanced Finite Element Methods ↗ (*)	Summer	3
BGU32029	Nonlinear Finite Element Method ↗ (*)	Summer	3
BV320013	Investigations in practical structural analysis ↗ (lecture series over two semesters in German)	Winter + Summer	3
BV320007	Isogeometric Analysis and Design ↗	Summer	3
BGU32022	Finite Element Method for Fluid-Structure Interaction with Open-Source ↗	Summer	3
BV010011	Membrane Workshop ↗	Summer	3
BV320006	Modeling in Structural Analysis ↗ (in German)	Summer	3
BV010023	Structural Optimization 1 ↗ (*)	Winter	3
BGU32025	Structural Wind Engineering ↗	Winter	6
BV320001	Theory of Plates ↗ (*)	Winter	3
BV320002	Theory of Shells ↗ (*)	Summer	3
ED120115	Computational Design and Fabrication 1 ↗	Winter	6
ED120116	Computational Design and Fabrication 2 ↗	Summer	6
ED120114	Project Week Computational Design and Fabrication ↗	W/S	3
ED130115	Particle Based Methods in Engineering ↗	Winter	3

(*) If not taken as part of a core elective module.

Structural Mechanics

Module Number	Module Title	Semester	Credits
	Structural Dynamics ↗ (*)	Summer	6
	Boundary Element Method ↗	Summer	3

Module Number	Module Title	Semester	Credits
ED130099	Structural Dynamics Lab	Winter	3
BV430002	Integral Transform Methods	Summer	3
BV000122	Introduction into Technical Acoustics (only TA1)	Summer	3
BGU43026	Modelling and Simulation in Structural Dynamics	Winter	3
BGU43019	Soil Vibrations - Emission, Propagation, Immission, Abatement	Winter	3
BV430005	Stability of Structures	Winter	3
BGU43012T2	Technical Acoustics (TA1 + TA2)	S/W	6

(*) If not taken as part of a core elective module.

Others

Module Number	Module Title	Semester	Credits
MA9304	Introduction to Functional Analysis (BV/COME)	Winter	5
MW0376	id Mechanics	Summer	5
MW1817	Biomechanics - Fundamentals and Modeling	Summer	5
IN2026	id	Winter	5
IN2147	Parallel Programming	Summer	5
ED140023	Deep Learning for PDEs in Engineering Physics	Summer	4
ED140017	Vibroacoustic Simulation - Statistical Energy Analysis and Hybrid Methods	Summer	3
MW2152	Modeling, Control and Design of Wind Energy Systems	Winter	5
MW2323	Computational Acoustics	Summer	5
MW0696	Particle-Simulation Methods for Fluid Dynamics	Winter	3

Module Number	Module Title	Semester	Credits
MW0866	Multibody Simulation	Summer	3
MA3305	Numerical Programming 1 (CSE)	Winter	8
CIT123000	Computing and Machine Learning	Winter	5
ED140002	Physikbasierte Modellierung und Simulation additiver Fertigungsverfahren für Metalle	Winter	5
SOT86701	EuroTeQ Collider. Enhancing Connections for Sustainable Futures (MSc)	Winter	6

Study Projects

During your studies, you can include a study project in your curriculum. Study projects are offered depending on availability and are often agreed upon between a supervisor and a student individually. If you're interested in doing a study project, you can reach out to a professor or research assistant in COME whose research and topics you're interested in and ask whether there are topics for study projects. In case you're in doubt, do not hesitate us via [come\(at\)tum.de](mailto:come(at)tum.de) for further questions. The below modules only differ in the awarded credits and thus the agreed-upon workload. The details can be worked out with your supervisor.

Module Number	Module Title	Credits	Corresponding Chair
ED130117	Study Project in Computational Mechanics	3	All COME chairs
ED130118	Study Project in Computational Mechanics	4	All COME chairs
ED130119	Study Project in Computational Mechanics	5	All COME chairs
ED130120	Study Project in Computational Mechanics	6	All COME chairs

Individual Elective Modules

At least 17 out of the 27 elective credits have to be gained with modules from the official curriculum. That means we can accredit up to 10 credits from individually chosen modules

(like courses in the ATHENS Program, modules offered by other departments in the TUM School of Engineering and Design (such as mechanical engineering), which are not listed in the official curriculum, etc.). You can find a list of individual elective courses that have been accepted in the past [here](#) ↓. However, **this list does not contain all courses that could be accepted** as individual electives since there are too many courses that could be accredited as individual elective courses to list all of them. Generally, we can accredit most courses that either improve your knowledge in the theories behind methods of computational mechanics or deal with applications of computational mechanics. However, fundamental modules from bachelor studies or modules with contents very similar to modules from the COME curriculum are excepted from the accreditation.

Procedure

If you want to take an individual elective course, please ask the course coordinator whether it can be accredited as an individual elective. This is also necessary in case the course is listed in the above file. The reason for this procedure is that individual elective courses are not part of your curriculum but must be added to it manually. This is done by the examination administrator, who requires a confirmation from the course coordinator in order to add this course to your curriculum.

For the registration, please select free registration in TUM online since the individual elective courses are initially not part of your curriculum. As soon as you passed the exam, please inform the examination administrator so that the individual elective course gets accredited and added to your curriculum.

Examples

If you, for example, want to gain further knowledge in aerospace, you could take the courses "Aeroelasticity" (MW2228) and "Aircraft Performance" (MW0832). Both courses are worth 5 ECTS each. Therefore, you would have exactly 10 ECTS of individual electives. Within the category of electives, you then need at least 17 ECTS from the COME curriculum. Since most courses in COME are either worth 3 or 6 ECTS, you will probably not achieve exactly 17 ECTS but overshoot and achieve for example 18 ECTS. However, this is not a problem at all since you can finish your program also with more than 120 ECTS.

Another example: If you want to take more courses about machine learning and deep learning, you could take the course "Introduction to Deep Learning" (IN2346). This course is worth 6 ECTS. Please note here, that **we cannot cut the credits of modules so that the exactly 10 ECTS!** Therefore, you could not take "Advanced Deep Learning for Physics" (IN2298) additionally to "Introduction to Deep Learning" because both courses are worth 12 ECTS together. Instead, you could only take a further course worth maximum 4 ECTS. However, you also don't have to take exactly 10 ECTS of individual electives, so you could also just take one of the two courses and then require at least 21 ECTS of elective courses from the COME curriculum.

General Education Elective Modules

You need to pass 3 credits of general education elective modules, to be chosen from numerous module offers.

The list of general education modules is continuously updated. If you found a module that you are interested in, please do not hesitate to contact us.

Language courses

Language courses can be accounted for within the general education modules. You can find a list of offers on the [website of the language center](#) and in [TUMonline](#).

The following rules apply:

- The minimum level of a German language course is B1 in order to be considered within the general education catalog.
- English courses are only valid if they are specific technical courses, such as English for Engineers or similar. They have to be above the standard English requirements that we require you to have in order to study at TUM. In case you're in doubt about the requirements, please contact the examination office
- Language courses in the students' native language are not permitted.
- For all other languages, there are no requirements. Please be aware that we can only consider modules up to 3 ECTS.

If a specific course is not linked to our curriculum in TUMonline, please write an email to [come\(at\)tum.de](mailto:come(at)tum.de).

Center of Key Competences

A lot of general education courses and workshops are offered by the [Center of Key Competencies](#). You will find all the information about their courses on the website and the corresponding [Wiki](#).

Kontextlehre WTG

A lot of seminars and workshops can also be found at the TUM School of Social Sciences and Technology within the [Science ∞ Technology ∞ Society \(Kontextlehre WTG\) program](#).

Most of the courses that are offered in English are linked to our curriculum in TUMonline. If a specific course is missing, please write an email to [come\(at\)tum.de](mailto:come(at)tum.de).

Virtuelle Hochschule Bayern

The Virtuelle Hochschule Bayern (VHB) is a joint institution connecting universities across Bavaria. It offers a variety of online courses that can be taken by students enrolled at a Bavarian university.

You can check the current course offers in the [VHB course](#) catalog. Recognition within the general electives profile is granted upon request. Please write an informal email stating the course title to [come\(at\)tum.de](mailto:come@tum.de) and ask for recognition of the specific course.

Courses from VHB are not linked to the curriculum in TUMonline.

Thesis

Despite the fact that the following page collects a lot of formal information, we would like to emphasize that writing your Master's thesis should, in the first place, be something you enjoy and are interested in. So, if you're still in the process of finding a suitable topic, take some time, have a look around at the COME chairs, and talk to the supervisors who are working in a field that suits your interests.

Find a Thesis Topic

In general, there are **three ways to find our perfect Master's thesis topic:**

- There is a fully worked-out project proposal. These are usually published on the chairs' websites.
- You are interested in a specific scientific topic and know a researcher at one of our chairs is working on that topic. You can contact them and discuss possible projects that could be carried out in the scope of your thesis. The research topics and corresponding researchers are usually listed on the chairs' websites.
- You have a thesis topic worked out on your own, or in collaboration with a company, and would like to know whether this topic could be done within the scope of your thesis. Take the initiative and contact a supervisor at one of the COME chairs that you think is suitable for this topic. If you're not sure about who this could be, you are welcome to discuss the matter with your study coordinators.

In all cases, you will need to actively look for a thesis topic. **We won't assign topics automatically.**

Please allow for some time for finding a thesis topic and the time it takes until registration. If you have a fixed timeline for your thesis in mind, please start sufficiently early with the process.

General Rules

It is possible to complete your thesis either at university or in industry, and **it is worth 30 credits**. The following rules should be noted.

- You can start your Master's thesis if the following holds:
 - You have successfully completed **at least 78 ECTS**,
 - You have completed **all but one compulsory and one core elective subject**,
 - In case you're still waiting for exam results to be published, registration is possible from the beginning of any semester **if it is expected** that the above two rules will be

fulfilled after the examination period.

- The period of time between thesis registration and submission of the completed Master's thesis **must not exceed 6 months**.
- The Master's thesis has to be defended in the master's colloquium.
- The thesis can be **supervised by a number of chairs** within the TUM School of Engineering and Design.
 - Any of the COME chairs within the department of Civil and Environmental Engineering is suitable.
 - If you're interested in writing your thesis at a chair in another department, please write to us at [✉come\(at\)tum.de](mailto:come(at)tum.de), and we will quickly check your request.
- If you want to write your thesis in **collaboration with industry**, you have to find an academic co-supervisor at a chair at TUM. Please get in touch with your COME coordinator for assistance. We will gladly help you in finding the right chair for your external thesis topic.

Registration

Once you have accumulated enough credits, identified a suitable thesis topic, and obtained approval from your supervisor, your thesis will be registered at the school office. This process will be conducted by your supervisor and is fully digital. You will receive an email with a confirmation request. You don't need to register the thesis yourself.

Further Information

- Courses and further information on scientific writing and working can be found at the [Centre for Key Competences](#) and the [university library](#) [🔗](#).
- You can find the official **TUM citation guideline** [here](#) [↓](#).
- The [English Writing Center](#) [🔗](#) offers free one-to-one consulting in English writing to all members of the TUM community, as well as Thesis Writers' workshops, out of which the following two might be interesting to you:
 - [Natural Sciences and Engineering](#) [🔗](#)
 - [Design and Engineering](#) [🔗](#)

Submission

You must upload the thesis to the school portal (**at the latest 6 months after registration**). Please check further details with your thesis supervisor.

Your supervisor will take care of the grading of your thesis and will report the grade to the COME examination administration via the online portal of the school. The examination administration will enter your grade into your curriculum in TUMonline.

Please check in the meantime whether your curriculum is complete:

- Are all grades inserted?
- Do you still need some accreditation (e.g., ATHENS course, language course...)?
- Can you skip some elective credits in order to improve your GPA?

Please contact the COME examinations administration if something needs to be changed.

The COME examination administration will forward all your grades to the central examination office to produce your degree certificate. The corresponding course director will sign it. You will receive an information letter (to your address, which you have entered in TUMonline) from the examination office as soon as the certificate is finished, in which they will ask you to collect the certificate. Generally, you may need to wait a few weeks after completing your curriculum for this letter.

Extracurricular Offers

In addition to the degree requirements, you are welcome to participate in further offers at TUM.

Extracurricular courses and modules do not count towards the fulfillment of your degree but can be shown on your transcript of records most of the times.

In the following we give hints to various offers at and around TUM:

- Summer school [Ferienakademie Sarntal](#), takes place once a year,
- [EuroTeQ courses](#), developed in partnership with academic partners in the EuroTeQ network,
- [TUM project weeks](#), in which you work on interdisciplinary projects that tackle current societal needs,
- [TUM plug-in modules](#), to broaden your horizon and get a flavour of other disciplines,
- courses from the [Athens network](#), study a specific topic at another European university for a week (few courses might also be counted in your curriculum, reach out to us via [come\(at\)tum.de](mailto:come(at)tum.de) to check accreditation).