

Examination and Academic Regulations for the Bachelor's Program in Management & Technology at the Technical University of Munich

dated September 13, 2013

as amended by the Fourth Amendment Statute of June 1, 2017

In accordance with Art. 13 (1) sentence 2 in conjunction with Art. 58 (1) sentence 1 and Art. 61 (2) sentence 1 of the Bayerisches Hochschulgesetz (BayHSchG) [Bavarian Higher Education Act] the Technical University of Munich issues the following Examination and Academic Regulations (Fachprüfungs- und Studienordnung, FPSO):

Introductory note on linguistic usage

In accordance with Art. 3 (2) of the German Constitution, women and men have equal rights. Any terms relating to persons and functions mentioned in the following regulations are equally valid for women and men.

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I. General Provisions

§ 34

Applicability, Academic Title, German Track, English Track, Campus Straubing Related Programs

- (1) ¹These Examination and Academic Regulations (FPSO) complement the General Academic and Examination Regulations for Bachelor's and Master's programs at the Technical University of Munich (APSO) of March 18, 2011 as amended. ²The APSO shall have precedence.
- (2) ¹Upon successful completion of the Bachelor's examination the degree "Bachelor of Science" ("B.Sc.") is awarded. ²The academic title may be used with the name of the university "(TUM)".
- (3) The Bachelor's Program in Management & Technology is offered in both German ("German track") and English ("English track"). By choice of the specialization in technology Renewable Resources (German Track) the entire Bachelor's program is offered at the campus in Straubing.
- (4) ¹The Diplom in Management & Technology at the Technical University of Munich is a related program. ²Where a student transfers from another university to the Technical University of Munich, the examination board in charge will decide on the basis of the examination/general academic regulations of that other university if the programs are related.

§ 35

Commencement of Studies, Standard Duration of Study, ECTS

- (1) Commencement of the Bachelor's program in Management & Technology is set out in § 5 of the APSO.
- (2) ¹The number of classes in required and elective subjects needed to complete the Bachelor's degree is 156 credits (100 weekly hours per semester). ²In addition, nine weeks (12 credits) are required for the completion of the Bachelor's thesis. ³Furthermore, 12 credits for the Project Studies module (usually 360 hours) will be required. ⁴The number of coursework units and examinations in required, required elective and elective subjects to be completed in the Bachelor's program in Management & Technology according to Appendix 1 (II) is thus a minimum of 180 credits. ⁵The standard duration of study for the Bachelor's program will be a total of six semesters.

§ 36

Eligibility Requirements

- (1) The Bachelor's program in Management & Technology requires compliance with the general admission requirements for university studies as specified in the regulations governing eligibility for studies at universities of the Free State of Bavaria and state-recognized private institutions of higher education (Qualifikationsverordnung-QualV

[Eligibility Regulations]) (BayRS [official compilation of Bavarian laws] 2210-1-1-3-UK/WFK) as amended.

- (2) In addition, proof of aptitude pursuant to the aptitude assessment regulations for the Bachelor's program in Management & Technology dated May 4, 2017, as amended, is required.

§ 37

Modular Structure, Courses, Language of Instruction

- (1) ¹General provisions on modules and courses are set out in §§ 6 and 8 of the APSO. ²For any changes to the stipulated module provisions, § 12 (8) of the APSO shall apply.
- (2) The curriculum listing the required, required elective and elective modules to be attended is included in Appendix 1 (II).
- (3) ¹The language of instruction is given in Appendix 1 (II) Examination Modules. ²Where the language of instruction for a module is specified as either English or German in Appendix 1 (II), the examiner will authoritatively determine the actual language of instruction in a suitable manner prior to commencement of classes.

§ 37 a

Project Studies

- (1) ¹The Project Studies module consists of active involvement in a research or practical project connected to the contents of the degree program. ²It is carried out by a group of at least two students and must be completed by the end of the sixth semester in which the student is registered for courses awarding credits toward the degree. ³Evaluation of the Project Studies module is governed by § 17 APSO.
- (2) ¹The Project Studies module is supervised by a professor from TUM School of Management. ²Furthermore, research associates may also be appointed as examiners as long as the relevant conditions of the applicable version of the regulation on university examiners are met. ³The supervisor shall announce, at the latest when the student is registered for the Project Studies module, what type of examinations according to § 41 (1) e) must be completed in order for the student to be deemed to have successfully participated in the Project Studies module, and how those examinations are to be weighted.
- (3) ¹The Project Studies module may also be carried out under the auspices of one of the technical departments, as long as the tasks are assigned jointly with a professor from TUM School of Management. ²Subsection (2), sentence 2 applies accordingly.

§ 38

Examination Deadlines, Progress Monitoring, Failure to Meet Deadlines

- (1) Examination deadlines, progress monitoring, and failure to meet deadlines are governed by § 10 of the APSO.
- (2) ¹By the end of the second semester, students must earn 18 credits from the following module examinations listed in Appendix 1 (II): "Mathematik I/Mathematics I"

(6 credits, first semester in which the student is registered for courses awarding credits toward the degree), "Management Science" (6 credits, first semester in which the student is registered for courses awarding credits toward the degree), "Volkswirtschaftslehre I/Economics I – Microeconomics " (6 credits, first semester in which the student is registered for courses awarding credits toward the degree) and "Statistik/Statistics" (6 credits, second semester in which the student is registered for courses awarding credits toward the degree). ²In the event of failure to meet deadlines § 10 (5) of the APSO shall apply.

§ 39 Examination Board

Pursuant to § 29 of the APSO the board responsible for all decisions concerning examination matters shall be the Bachelor's Examination Board of TUM School of Management.

§ 40 Recognition of Periods of Study, Coursework and Examination Results

The recognition of periods of study, coursework and examination results is governed by the provisions of § 16 of the APSO.

§ 41 Continuous Assessment Procedure, Types of Assessment

- (1) In addition to written examinations (*exam*) and oral examinations, types of assessment pursuant to § 12 and § 13 of the APSO may include (but are not limited to) laboratory assignments, exercises (tests, where applicable), reports, project work, presentations, learning portfolios and/or research papers.
- a) ¹An **exam** is a supervised written examination. ²In these written examinations, students are expected to demonstrate, within a limited amount of time and using predefined methods and resources, their ability to identify problems, find solution strategies and, if required, implement them. ³The duration of exam is provided for in § 12 (7) of the APSO.
- b) ¹Depending on the discipline, **laboratory assignments** may include tests, measurements, field work, field exercises, etc. designed for practical implementation, evaluating results and gaining knowledge. ²They may consist of, for example, process descriptions and the underlying theoretical principles including the relevant literature; preparation and practical implementation; calculations, if required; documentation, evaluation, and interpretation of the results in the context of the knowledge to be gained. ³Laboratory assignments may be complemented by a presentation designed to demonstrate a student's communication competency in presenting scholarly work to an audience. ⁴Details of each laboratory assignment and the related competencies to be examined are set out in the module descriptions.
- c) ¹**Exercises (tests where applicable)** are administered to assess a student's ability to complete assigned tasks (for example, solving mathematical problems, writing computer programs, designing models) using theoretical knowledge to

solve application-oriented problems. ²Exercises are designed to assess a student's factual and detailed knowledge and its application. ³Practical exercises may be administered in writing, orally, or electronically. ⁴They may be in the form of homework assignments, practice sheets, programming exercises, (e-)tests, tasks assigned within a university internship program, etc. ⁵Details of each practical exercise and the related competencies to be examined are set out in the module descriptions.

- d) ¹A **report** is a written record and summary of a learning process for the purpose of presenting the acquired knowledge in a structured way and analyzing the results in the context of a module. ²Students are expected to demonstrate that they have understood all essential aspects and are able to present them in writing. ³Reports may include excursion reports, internship reports, work reports, etc. ⁴The written report may be complemented by a presentation for the purpose of assessing the student's communication competency in presenting scholarly work to an audience.
- e) ¹**Project work** is designed to reach, in several phases (initiation, problem definition, role assignment, idea generation, criteria development, decision, implementation, presentation, written evaluation), the defined objective of a project assignment within a given period of time and using suitable instruments. ²In addition, project work may include a presentation in order to assess a student's communication competency in presenting scholarly work to an audience. ³The specific components of each project work assignment and the related competencies to be assessed are delineated in the module description. ⁴Project work may include group work. ⁵Students are expected to demonstrate that they are able to complete the tasks in a team environment. ⁶A student's contribution to group work which is to be assessed as a component of an examination must be clearly identifiable and gradable. ⁷This also applies to each individual's contribution to the group result.
- f) ¹A **research paper** is a written assignment in which students work independently on solving complex scholarly or scholarly/application-oriented problems, using the scientific methods of the related discipline. ²Students are expected to demonstrate that they are able to solve problems corresponding to the learning results of the module in question in compliance with the guidelines for scholarly work – from analysis and conception to implementation. ³Research papers, differing in their requirement standards, may take the form of a conceptual framework/theory paper [*Thesepapier*], abstract, term paper, seminar paper, etc. ⁴The research paper may be complemented by a presentation and/or a colloquium for the purpose of assessing the student's communication competency in presenting scholarly work to an audience. ⁵Specific details on each research paper and the related competencies to be assessed are set out in the module description.
- g) ¹A **presentation** is a systematic and structured oral performance supported by suitable audio-visual equipment (such as a projector, slides, posters, videos) for the purpose of demonstrating and summarizing specific issues or results and paring complex problems down to their essential core. ²For the presentation, students are expected to demonstrate that they are capable of preparing a certain topic within a given time frame in such a way as to present or report it in a clear and comprehensible manner to an audience. ³In addition, students are expected to demonstrate that they are able to respond competently to any questions,

suggestions or discussions brought by the audience and relating to their subject area. ⁴The presentation may be complemented by a brief written précis. ⁵The presentation may be prepared either individually or in groups. ⁶A student's contribution to group work which is to be assessed as a component of an examination must be clearly identifiable and gradable. ⁷This also applies to each individual's contribution to the group result.

- h) ¹An **oral examination** is a timed, graded discussion on relevant topics and specific questions to be answered. ²In oral examinations students are expected to demonstrate that they have reached the qualification objectives laid out in the module descriptions, understood the central concepts of the subject matters covered by the exam, and are able to apply them to specific problems. ³The oral examination will be held either as an individual or group examination. ⁴The duration of the examination is provided for in § 13 (2) of the APSO.
- i) ¹A **learning portfolio** is a collection of written materials compiled by the student according to predefined criteria that exhibits the student's progress and achievements in defined content areas at a given time. ²Students are required to explain according to which criteria they have chosen the materials and their relevance for their learning progress and the achievement of the qualification objectives. ³With the learning portfolio, students are expected to demonstrate that they have taken active responsibility for their learning process and have reached the qualification objectives set out in the module description. ⁴Depending on the module description, types of independent study assessment in a learning portfolio may include, in particular, application-oriented assignments, websites, weblogs, bibliographies, analyses, conceptual framework/theory papers, as well as the graphic representation of facts or problems. ⁵The specific components of each learning portfolio and the related competencies to be assessed are set out in the module description.
- (2) ¹The module examinations will, as a rule, be taken concurrently with the program. ²Type and duration of module examinations are provided for in Appendix 1 (II). ²In the event of divergence from those provisions, § 12 (8) of the APSO must be complied with. ³The assessment of module examinations is governed by § 17 of the APSO.
- (3) Where Appendix 1 (II) provides that a module examination is either in written or oral form, the examiner must inform the students in appropriate form, no later than the first day of classes, of the type of examination to be held.
- (4) Upon request of a student and with the agreement of the examiners, examinations may be taken in the English language/a foreign language for courses taught in the German language.

§ 41 a Multiple Choice Test

The procedure for multiple choice tests is provided for in § 12 of the APSO.

§ 42 Coursework

In addition to the examination results specified in § 45 (1), successful completion of coursework in the required module "International Experience and Communication Skills" must be evidenced.

§ 43

Registration for and Admission to Examinations

- (1) ¹Students who are enrolled in the Bachelor's program in Management & Technology are deemed admitted to the module examinations of the Bachelor's examination, subject to the requirements stipulated in (3).
- (2) ¹The registration requirements for required, required elective, and elective module examinations are set out in § 15 (1) of the APSO. ²The registration requirements for repeat examinations for failed required and required elective modules are set out in § 15 (2) of the APSO. ³To register for modules in the English track, students must submit a language certificate in accordance with (3) or select the modules from the relevant track via TUMonline. ⁴Changes are possible at any time subject to (3).
- (3) To be admitted to examination modules from the English track in the third semester or later in which the student is registered for courses awarding credits toward the degree, proof must be submitted of adequate knowledge of English. Students whose native language or language of education is not English must submit proof of having passed a recognized language text, such as the Test of English as a Foreign Language (TOEFL) (scoring at least 88 points), the International English Language Testing System (IELTS) (at least 6.5 points), the Cambridge Main Suite of English Examinations, or other language tests authorized by the Academic Affairs Board and published on the website of the Admissions and Enrollment Office of the Technical University of Munich. Alternatively, this proof may take the form of a good grade in English (at least 10 out of 15 points) in a German higher education entrance qualification (HZB). If the student has successfully passed examination modules in English worth 12 credits as part of an undergraduate degree, adequate knowledge of English is similarly deemed to be proven.

§ 44

Repeat Examinations, Failed Examinations

- (1) The repetition of examinations is governed by § 24 of the APSO.
- (2) Failure to pass examinations is governed by § 23 of the APSO.

II. Bachelor's Examination

§ 45

Scope of the Bachelor's Examination

- (1) The Bachelor's examination consists of:
 1. the module examinations pursuant to subsection (2);
 2. the Project Studies module pursuant to § 37a;
 3. the Bachelor's thesis pursuant to § 46.

(2) ¹The module examinations are listed in Appendix 1. ²Students must earn:

1. 54 credits in required modules from Basics in Business,
2. 12 credits in required modules from Basics in Economics,
3. 12 credits in required modules from Basics in Law,
4. 12 credits in required modules from Basics in Mathematics & Natural Science.

³In the specialization in technology, students must earn:

1. 42 credits in required modules if they choose Chemistry,
2. 36 credits in required modules and a minimum of 6 credits from elective modules if they choose Informatics,
3. 37 credits in required modules and a minimum of 5 credits from elective modules if they choose Electrical and Information Technology,
4. 37 credits in required modules and a minimum of 5 credits from elective modules if they choose Mechanical Engineering,
5. a minimum of 42 credits in elective modules in Computer Engineering.
6. 36 credits in required modules and a minimum of 6 credits from elective modules if they choose Renewable Resources at the campus in Straubing

⁴In addition, students must earn a minimum of 18 credits in elective modules in the Elective in Management and Technology. ⁵Furthermore, they must also earn 6 credits from successfully completing coursework as part of the module International Experience and Communication Skills.

(3) ¹Where an elective module listed in the Appendix cannot be offered, § 8 (3) of the APSO shall apply. ²The selection of elective modules is governed by § 17 (5) sentences 6 to 8 of the APSO.

§ 46 Bachelor's Thesis

(1) ¹As provided for in § 18 of the APSO, each student must complete a Bachelor's thesis as part of their Bachelor's examination. ²The Bachelor's thesis topic may be determined and the thesis supervised by any expert examiner (*Themensteller*) from the School of Management of the Technical University of Munich. ³Expert examiners are the professors of the School, junior fellows of the School, and lecturers or professors of other TUM schools or colleges who teach on the program in Management & Technology.

(2) In order to be admitted to commence work on their Bachelor's thesis, students must have earned 84 out of a total of 90 credits in the required and elective modules of the basic courses (see Appendix 1 (II)) and the Project Studies module (12 credits).

(3) ¹The period of time between topic determination and submission of the completed Bachelor's thesis must not exceed three months. ²The Bachelor's thesis is considered presented and not passed if the student fails to submit it on time without valid reasons pursuant to § 10 (7) of the APSO. ³Twelve credits will be awarded for the successful completion of the Bachelor's thesis.

- (4) ¹If the Bachelor's thesis is not graded with at least "sufficient" (4.0), it may be repeated once with a new topic. ²Students must renew their application for admission within no more than six weeks from receipt of the grade.

§ 46 a

Additional Examinations

- (1) ¹With a positive credits account of at least 150 credits, students may, subject to approval from the Examination Board, take module examinations from the Master's program in Management and Technology (Track 1 or Track 2) as additional examinations. ²Failed additional examinations may be repeated once in the course of the Bachelor's program.
- (2) The results from the additional examinations will not be included in the overall average of the Bachelor's examination and will not be listed in the Bachelor's degree certificate.

§ 47

Passing and Assessment of the Bachelor's Examination

- (1) The Bachelor's examination is passed when the student has successfully completed all examinations required pursuant to § 45 and has earned a total of at least 180 credits.
- (2) ¹The module grade will be determined according to § 17 of the APSO. ²The overall grade for the Bachelor's examination will be calculated as the weighted grade average of the modules according to § 45 (2), the Project Studies module, and the Bachelor's thesis. ³The grade weights of the individual modules correspond to the credits assigned to each module. ⁴The overall grade is expressed by the designation pursuant to § 17 of the APSO.

§ 48

Degree Certificate, Diploma, Diploma Supplement

¹If the Bachelor's examination is passed, a degree certificate, diploma, and a diploma supplement including a transcript of records are to be issued in compliance with § 25 (1) and § 26 of the APSO. ²The date to be entered on the degree certificate is the day when all examination and coursework requirements have been fulfilled. ³Students completing all modules in English will receive a confirmation of having successfully completed the English track.

III. Final Provisions

§ 49

Entry into Force*)

- (1) ¹These Examination and Academic Regulations will enter into force on October 1, 2013. ²They shall apply to all students who commence their studies in the Bachelor's

program in Management and Technology at the Technical University of Munich as of the winter semester 2013/2014.

- (2) At the same time, the Examination Regulations for the Bachelor's program in Management and Technology at the Technical University of Munich of June 12, 2008, as last amended by the statutes from 15.04.2013, will cease to be in effect subject to the provision set forth in subsection (1), sentence 2.

*) This provision relates to the entry into force of the Regulations in their original version of September 13, 2013. The date of entry into force of the amendments is determined on the basis of the amendment statute.

APPENDIX 1:**I. Scope of the Bachelor's Examination**

	Components	Credits	Semester
1.	Examinations during the course of the program earning credits in required modules from Basics in Business	54	Semester 1/2/3/4
2.	Examinations during the course of the program earning credits in required modules from Basics in Economics	12	Semester 1/2
3.	Examinations during the course of the program earning credits in required modules from Basics in Law	12	Semester 3/4
4.	Examinations during the course of the program earning credits in required modules from Basics in Mathematics & Natural Science	12	Semester 1/2/3
5.	Examinations during the course of the program earning credits in the required and, if relevant, elective modules in the Specialization in Technology	42	Semester 2/3/4/5/6
6.	Examinations during the course of the program earning credits in elective modules from the Elective in Management & Technology	18	Semester 4/5/6
7.	Coursework during the program earning credits in module International Experience & Communication Skills	6	Semester 4/5/6
8.	Grade report from the Project Studies module pursuant to § 37a	12	Semester 4/5
9.	Bachelor's thesis pursuant to § 46	12	Semester 5/6

II. Examination Modules

1. German Track

Basics in Management, Economics, Law and Mathematics/Natural Science

Students must successfully complete the following required and elective modules in the Basics of Management, Economics, Law and Mathematics/Natural Science:

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
Basics in Business									
1	Foundations of Entrepreneurial and Ethical Business	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English/ German
2	Production and Logistics	Required	2 V + 2 Ü	2	4	6	Exam	120 min	English/ German
3	International Management and Organizational Behavior	Required	2 V + 2 Ü	3	4	6	Exam	120 min	English/ German
4	Empirical Research Methods	Required	2 V + 2 Ü	4	4	6	Exam	120 min	English/ German
5	Marketing and Innovation Management	Required	2 V + 2 Ü	4	4	6	Exam	120 min	English/ German
6	Management Science	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English/ German
7	Buchführung und Rechnungswesen	Required	2 V + 2 Ü	1	4	6	Exam	120 min	German
8	Kostenrechnung	Required	2 V + 2 Ü	2	4	6	Exam	60 min	German
9	Investitions- und Finanzmanagement	Required	2 V + 2 Ü	3	4	6	Exam	120 min	German
Basics in Economics									
10a	Volkswirtschaftslehre I - Mikroökonomie	Required	2 V + 2 Ü	1	4	6	Exam	120 min	German
	and								
10b	Volkswirtschaftslehre II - Makroökonomie	Required	2 V + 2 Ü	2	4	6	Exam	120 min	German

Basics in Law									
11a	Wirtschaftsprivatrecht I (inkl. juristischer Fallbearbeitung)	Required	2 V + 2 Ü	3	4	6	Exam	120 min	German
	and								
11b	Wirtschaftsprivatrecht II (inkl. juristische Fallbearbeitung)	Required	2 V + 2 Ü	4	4	6	Exam	120 min	German

Basics in Mathematics/Natural Science									
12	Mathematik I	Required	4 V	1	4	6	Exam	90 min	German/ English

13	Statistik	Required	3 V + 1 P	2	4	6	Exam	90 min	German/ English
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Specialization in Technology

Students must choose one of the following five specializations in technology.

If students choose the specialization in technology **Chemistry**, they must successfully complete all modules listed.

If students choose the specialization in technology **Informatics**, they must earn 36 credits from required modules and a minimum of 6 credits from an elective module. Below is a sample catalog of elective modules; the relevant catalog of elective modules will be published by the School of Management in appropriate form in good time before the first day of classes.

If students choose the specialization in technology **Electrical and Information Technology**, they must earn 37 credits from required modules and a minimum of 5 credits from an elective module. Below is a sample catalog of elective modules; the relevant catalog of elective modules will be published by the School of Management in appropriate form in good time before the first day of classes.

If students choose the specialization in technology **Mechanical Engineering**, they must earn 37 credits from required modules and a minimum of 5 credits from a catalog of elective modules from the Faculty for Mechanical Engineering.

If students choose the specialization in technology **Computer Engineering**, they must earn a minimum of 42 credits from a catalog of elective modules.

If students choose the specialization in technology **Renewable Resources**, they must earn 36 credits from required modules and a minimum of 6 credits from a catalog of elective modules. Students who choose this specialization can complete the entire Bachelor program Management & Technology in Straubing.

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
Chemistry									
1	Allgemeine und anorganische Chemie	Required	2 V + 2 Ü	2	4	6	Exam	90 min	German
2	Grundlagen der Physikalischen Chemie 1	Required	2 V + 2 Ü	3	4	6	Exam	90 min	German
3	Einführung in die Organische Chemie	Required	2 V + 2 Ü	4	4	6	Exam	90 min	German
4	Biologie für Chemiker	Required	2 V + 1 Ü	5	3	6	Exam	90 min	German
5	Chemisches Praktikum für TUM-BWL	Required	6 P	4	6	6	Laboratory assignment	n/a	German
6	Chemiesoftware und Datenbanken für TUM-BWL	Required	1 V + 1 Ü	6	2	3	Exam	60 min	German
7	Analytische Chemie	Required	2 V	5	2	3	Exam	90 min	German
8	Technische Chemie	Required	4 V	6	4	6	Exam	120 min	German

Informatics									
Required									
1	Einführung in die Informatik 1	Required	4 V	3	5	6	Exam	150 min	German/ English
2	Information Management for Digital Business Models	Required	2 V + 2 Ü	2	4	6	Exam	60 min	German/ English
3	Praktikum: Grundlagen der Programmierung	Required	3 P + 1 Ü	3	4	6	Exercise	n/a	German/ English
4	Einführung in die Softwaretechnik	Required	3 V + 2 Ü	4	5	6	Exam	150 min	German/ English

5	Grundlagen Betriebssysteme und Systemssoftware	Required	3 V + 1 Ü	5	4	6	Exam	90 min	German/ English
6	Grundlagen Datenbanken	Required	3 V + 1 Ü	5	4	6	Exam	150 min	German/ English
Elective									
7	Einführung in die Informatik 2	Elective	2 V + 2 Ü	5/6	4	5	Exam	75-120 min	German/ English
8	Bachelor-Praktikum	Elective	6 P	5/6		10	Project assignment		German/ English
9	Bildverstehen I: Methoden der industriellen Bildverarbeitung	Elective	2 V	5/6	2	3	Oral	30 min	German/ English
10	Elektronisches Publizieren / Document Engineering und das World-Wide Web	Elective	3 V + 1 Ü	5/6	4	5	Exam	90-120 min	English
11	Dreidimensionale Nutzerschnittstellen	Elective	2 V + 2 Ü	5/6	5	6	Exam	90 min	English
12	Programmiersprachen	Elective	2 V + 2 Ü	5/6	4	5	Exam	90 min	German/ English
13	IT Sicherheit	Elective	3 V + 1 Ü	5/6	4	5	Exam	90 min	German/ English
14	Software-Engineering in der industriellen Praxis	Elective	2 V	5/6	2	3	Exam	75 min	German/ English
15	Algorithmen und Datenstrukturen (für ET/IT)	Elective	4 V + 2 Ü	5/6	6	5	Written	120 min	German/ English

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
Electrical and Information Technology									
Required									
1	Mathematics II	Required	2 V + 2 Ü	2	4	6	Exam	90 min	English
2	Grundlagen der Informationstechnik	Required	2 V + 1 Ü	3	3	5	Exam	75 min	German/ English
3	Principles in Electrotechnology	Required	2 V + 1 Ü	3	3	6	Exam	90 min	English
4	Elektrotechnik	Required	2 V + 1 Ü	4	3	5	Exam	90 min	German
5	Analog Electronics	Required	2 V + 1 Ü	4	3	5	Exam	90 min	English
6	Nachrichtentechnik I	Required	2 V + 1 Ü	5	3	5	Exam	75 min	German/ English
7	Introduction into Computer Science (for non Informatics studies)	Required	2 V + 2 Ü	5	4	5	Exam	120 min	English
Elective									
8	Kommunikationsnetze	Elective	3 V + 1 Ü	5/6	4	5	Exam	90 min	German/ English
9	Praktikum Schaltungselektronik	Elective	4 P	5/6	4	5	Exam	90 min	German/ English
10	Nutzung regenerativer Energien für TUM-BWL	Elective	3 V + 1 Ü	5/6	4	5	Exam	60 min	German/ English
11	Grundlagen der Hochfrequenztechnik	Elective	3 V + 1 Ü	5/6	4	5	Exam or oral	60 min or 30 min	German/ English
12	Nachrichtentechnik II	Elective	2 V + 1 Ü	5/6	3	5	Exam	40 min	German/ English
13	Energietechnische Anlagen	Elective	2 V + 1 Ü	5/6	3	5	Exam	30 min	German/ English
14	Internetkommunikation	Elective	2 V + 2 Ü	5/6	4	5	Oral exam	45 min	German/ English

15	Photovoltaische Insel-systeme für TUM-BWL	Elective	3 V + 1 Ü	5/6	4	5	Exam	60 min	German/English
16	Audiokommunikation	Elective	2 V + 1 Ü	5/6	4	5	Oral exam	30 min	German/English
No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem.	SWS	Credits	Type of examination	Duration of examination	Language of instruction
Mechanical Engineering*									
1	Introduction into Computer Science (for non Informatics studies)	Required	2 V + 2 Ü	3	4	5	Exam	120 min	English
2	Mathematik II	Required	2 V + 2 Ü	2	4	6	Exam	90 min	English
3	CAD und Maschinenzichnen 1 und 2	Required	2 V + 2 Ü	5/6 ¹⁾	4	5	2 exercises (pieces of coursework) and Exam	60 min	German
4	Grundlagen der Entwicklung und Produktion	Required	3 V	4	3	3	Exam	90 min	German
5	Technische Mechanik (separate for TUM-BWL)	Required	2 V + 2 Ü	3	4	6	Exam	120 min	German
6	Maschinenelemente – Grundlagen, Fertigung, Anwendung	Required	3 V + 2 Ü	5	5	7	Exam	120 min	German
7	Werkstoffe im Maschinenwesen	Required	2 V + 2 Ü	4	4	5	Exam	90 min	German/English

* In addition to the required modules indicated, students must successfully complete modules worth a minimum of 5 credits from a supplementary catalog of elective modules from the courses offered by the Faculty for Mechanical Engineering. This supplementary catalog of elective modules will be published by the School of Management in appropriate form in good time before the first day of classes.

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem.	SWS	Credits	Type of examination	Duration of examination	Language of instruction
Computer Engineering									
1	Introduction into Computer Science (for non Informatics studies)	Elective	2 V + 2 Ü	2-6	4	5	Exam	120 min	English
2	Information Management for Digital Business Models	Elective	2 V + 2 Ü	2-6	4	6	Exam	60 min	English
3	Mathematics II	Elective	2 V + 2 Ü	2-6	4	6	Exam	90 min	English
4	Bachelor Practical Course	Elective	6 P	2-6		10	Project work		English
5	3D User Interfaces	Elective	2 V + 2 Ü	2-6	5	6	Exam	90 min	English
6	Programming Languages	Elective	2 V + 2 Ü	2-6	4	5	Exam	90 min	English
7	Principles of Information Engineering	Elective	2 V + 1 Ü	2-6	4/6	5	Exam	75 min	English
8	Principles in Electrotechnology	Elective	2 V + 1 Ü	2-6	3	6	Exam	90 min	English
9	Analog Electronics	Elective	2 V + 1 Ü	2-6	3	5	Exam	90 min	English

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
Renewable Resources									
Required									
1	Physik	Required	2 V + 2 Ü	3	4	6	Exam	90 min	German
2	Allgemeine und anorganische Chemie	Required	2 V + 2 Ü	3	4	6	Exam	120 min	German
3	Grundlagen der organischen Chemie	Required	2 V + 2 Ü	4	4	6	Exam	120 min	German
4	Technische Thermodynamik	Required	2 V + 2 Ü	5	4	6	Exam	120 min	German
5	Forst und Holz	Required	2 V + 2 Ü	5	4	6	Exam	90 min	German
6	Einführung in die Informatik	Required	2 V + 2 Ü	2	4	6	Exam	90 min	German
Elective									
7	Wärmelehre	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	German
8	Physikalische Chemie	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	German
9	Biopolymere für Ökonomen	Elective	2 V	4/5/6	2	3	Exam	90 min	German
10	Strömungsmechanik	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	German
11	Chemische und thermische Verfahrenstechnik	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	German
12	Bioverfahrenstechnik	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	German
13	Energietechnik und Energiesysteme	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	60 min	German
14	Grundlagen Pflanzenproduktion	Elective	4 V	4/5/6	4	6	Exam	90 min	German
15	Elektrische Energietechnik	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	German
16	Industrielle Chemie	Elective	2 V	4/5/6	2	3	Exam	90 min	German
17	Grundlagen der stofflichen Biomassennutzung	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	60min	German

Elective in Management & Technology

For the Elective in Management & Technology, students must pass examinations in the area of management or technology worth 18 credits. The catalog of elective modules will be published by the School of Management in appropriate form in good time before the first day of classes. The following is a **sample catalog of electives**:

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
1	Patente und Know-how-Schutz	Elective	2 V	4/5/6	2	3	Exam	60 min	German
2	Lizenzvertragsrecht	Elective	2 V	4/5/6	2	3	Exam	60 min	English
3	Businessplan – Grundlagenseminar	Elective	2 S	4/5/6	2	3	Project work		German/ English
4	Businessplan - Aufbauseminar	Elective	2 S	4/5/6	2	6	Project work		German/ English
5	Introduction to Entrepreneurial Behavior	Elective	4 S	4/5/6	4	6	Research paper		English
6	Topics in Marketing, Strategy and Leadership	Elective	4 S	4/5/6	4	6	Research paper		English
7	Project Management	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English

8	Seminar in Finance and Accounting	Elective	4 S	4/5/6	4	6	Research paper		English
9	Topics Operations & Supply Chain Management (OSCM)	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	English
10	Transportation Logistics	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English
11	Gesellschaftsrecht 1	Elective	2 V	4/5/6	2	3	Exam	60 min	German/English
12	Grundlagen und internationale Aspekte der Unternehmensführung	Elective	4 V	4/5/6	4	6	Exam	120 min	German/English
13	Topics in Finance & Accounting	Elective	2 V	4/5/6	2	3	Exam	60 min	English
14	Entrepreneurial Finance	Elective	4 V	4/5/6	4	6	Exam	120 min	English
15	Advanced Technology and Innovation Management	Elective	4 V	4/5/6	4	6	Exam	120 min	English
16	Entrepreneurial Management	Elective	4 S	4/5/6	4	6	Research paper		German/English
17	Topics in Innovation & Entrepreneurship	Elective	4 S	4/5/6	4	6	Exam	120 min	English
18	Grundlagen der Verhandlungsführung	Elective	4 S	4/5/6	4	6	Research paper		German/English
19	Corporate Finance	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	English
20	Gesellschaftsrecht 2	Elective	2 V	4/5/6	2	3	Exam	120 min	German/English
21	Procurement and Sourcing	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English
22	Service Operations Management	Elective	4 V	4/5/6	4	6	Exam	120 min	English
23	Marktforschung und Konsumentenverhalten bei Nachwachsenden Rohstoffen	Elective	2 V + 2 P	4/5/6	4	6	Oral Project work	20 min	German
24	Businessplan / Entrepreneurship	Elective	2 V + 2 U	4/5/6	4	6	Project work		German
25	Introduction to Environmental and Resource Economics	Elective	2 V + 2 U	4/5/6	4	6	Exam	90 min	English
26	Introduction to Development Economics	Elective	2 V + 2 U	4/5/6	4	6	Exam	90 min	English
27	Politische und volkswirtschaftliche Rahmenbedingungen	Elective	4 V	4/5/6	4	5	Exam	90 min	German

International Experience & Communication Skills

The module "International Experience & Communication Skills" consists of two parts. For the "International Experience" part, students must successfully complete a piece of coursework in the form of a report. For the "Communication Skills" part, they must successfully complete a course, including a piece of coursework, from a catalog of electives. The supplementary catalog of electives will be published by the School of Management in appropriate form in good time before the first day of classes.

	Module name	Type of module	Type of instruction SW,75 S/ SV Ü P	Sem .	SWS	Credits	Type of examination	Duration of examination	Language of instruction
	International Experience & Communication Skills								
	International Experience & Communication Skills	Required	2 V + 2 S	4-6 ²⁾	4	6	2 pieces of coursework	n/a	German/English

Project Studies

	Project Studies								
	Project Studies								
	Project Studies	Required		5 ²⁾		12	Project work		German/English

Bachelor's Thesis

	Bachelor's Thesis								
	Bachelor's Thesis								
	Bachelor's Thesis	Required		6 ²⁾		12			German/English

Key:

Sem. = Semester; SWS = *Semesterwochenstunden* (weekly hours per semester); V = *Vorlesung* (lecture); Ü = *Übung* (exercise); P = *Praktikum* (internship), Se = Seminar. For written/oral examinations, the column "Duration of Examination" gives the length of the examination in minutes.

Notes:

²⁾ This module can be stretched over two semesters or more.

2. English Track

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem.	SWS	Credits	Type of examination	Duration of examination	Language of instruction
Basics in Business									
1	Foundations of Entrepreneurial and Ethical Business	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English
2	Production and Logistics	Required	2 V + 2 Ü	2	4	6	Exam	120 min	English
3	International Management and Organizational Behavior	Required	2 V + 2 Ü	3	4	6	Exam	120 min	English
4	Empirical Research Methods	Required	2 V + 2 Ü	4	4	6	Exam	120 min	English
5	Marketing and Innovation Management	Required	2 V + 2 Ü	4	4	6	Exam	120 min	English
6	Management Science	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English
7	Financial Accounting	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English
8	Cost Accounting	Required	2 V + 2 Ü	2	4	6	Exam	120 min	English
9	Investment and Financial Management	Required	2 V + 2 Ü	3	4	6	Exam	120 min	English
Basics in Economics									
10a	Economics I - Microeconomics	Required	2 V + 2 Ü	1	4	6	Exam	120 min	English
	and								
10b	Economics II - Macroeconomics	Required	2 V + 2 Ü	2.	4	6	Exam	120 min	English

Basics in Law									
11a	Introduction to Business Law	Required	2 V + 2 Ü	3	4	6	Exam	120 min	English
	and								
11b	Business Law II	Required	4 V	4	4	6	Exam	120 min	English

Basics in Mathematics & Natural Science									
12	Mathematics I	Required	4 V	1	4	6	Exam	90 min	English
13	Statistics	Required	3 V + 1 P	2	4	6	Exam	90 min	English

Specialization in Technology

For the specialization in technology **Computer Engineering**, students must earn a minimum of 42 credits from a catalog of elective modules.

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem.	SWS	Credits	Type of examination	Duration of examination	Language of instruction
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Computer Engineering									
1	Introduction into Computer Science (for non Informatics studies)	Elective	2 V + 2 Ü	2-6	4	5	Exam	120 min	English
2	Information Management for Digital Business Models	Elective	2 V + 2 Ü	2-6	4	6	Exam	60 min	English
3	Mathematics II	Elective	2 V + 2 Ü	2-6	4	6	Exam	90 min	English
4	Bachelor Practical Course	Elective	6 P	2-6		10	Project work		English
5	3D User Interfaces	Elective	2 V + 2 Ü	2-6	5	6	Exam	90 min	English
6	Programming Languages	Elective	2 V + 2 Ü	2-6	4	5	Exam	90 min	English
7	Principles of Information Engineering	Elective	2 V + 1 Ü	2-6	4/6	5	Exam	75 min	English
8	Principles in Electrotechnology	Elective	2 V + 1 Ü	2-6	3	6	Exam	90 min	English
9	Analog Electronics	Elective	2 V + 1 Ü	2-6	3	5	Exam	90 min	English

Elective in Management & Technology

For the Elective in Management & Technology, students must pass examinations in the area of management or technology worth 18 credits. The catalog of elective modules will be published by the School of Management in appropriate form in good time before the first day of classes. The following is a **sample catalog of electives**:

No.	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	S W S	Credits	Type of examination	Duration of examination	Language of instruction
1	Patente und Know-how Schutz	Elective	2 V	4/5/6	2	3	Exam	60 min	German
2	Lizenzvertragsrecht	Elective	2 V	4/5/6	2	3	Exam	60 min	English
3	Businessplan – Grundlagenseminar	Elective	2 S	4/5/6	2	3	Project work		German/ English
4	Businessplan - Aufbauseminar	Elective	2 S	4/5/6	2	6	Project work		German/ English
5	Introduction to Entrepreneurial Behavior	Elective	4 S	4/5/6	4	6	Research paper		English
6	Topics in Marketing, Strategy and Leadership	Elective	4 S	4/5/6	4	6	Research paper		English
7	Project Management	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English
8	Seminar in Finance and Accounting	Elective	4 S	4/5/6	4	6	Research paper		English
9	Topics Operations & Supply Chain Management (OSCM)	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	English
10	Transportation Logistics	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English
11	Gesellschaftsrecht 1	Elective	2 V	4/5/6	2	3	Exam	60 min	German/ English
12	Grundlagen und internationale Aspekte der Unternehmensführung	Elective	4 V	4/5/6	4	6	Exam	120 min	German/ English
13	Topics in Finance & Accounting	Elective	2 V	4/5/6	2	3	Exam	60 min	English
14	Entrepreneurial Finance	Elective	4 V	4/5/6	4	6	Exam	120 min	English

15	Advanced Technology and Innovation Management	Elective	4 V	4/5/6	4	6	Exam	120 min	English
16	Entrepreneurial Management	Elective	4 S	4/5/6	4	6	Research paper		German/English
17	Topics in Innovation & Entrepreneurship	Elective	4 S	4/5/6	4	6	Exam	120 min	English
18	Grundlagen der Verhandlungsführung	Elective	4 S	4/5/6	4	6	Research paper		German/English
19	Corporate Finance	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	120 min	English
20	Gesellschaftsrecht 2	Elective	2 V	4/5/6	2	3	Exam	120 min	German/English
21	Procurement and Sourcing	Elective	2 V + 2 Ü	4/5/6	4	6	Exam	90 min	English
22	Service Operations Management	Elective	4 V	4/5/6	4	6	Exam	120 min	English

International Experience & Communication Skills

The module "International Experience & Communication Skills" consists of two parts. For the "International Experience" part, students must successfully complete a piece of coursework in the form of a report. For the "Communication Skills" part, they must successfully complete a course, including a piece of coursework, from a catalog of electives. The supplementary catalog of electives will be published by the School of Management in appropriate form in good time before the first day of classes.

	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	SWS	Credits	Type of examination	Duration of examination	Language of instruction
	International Experience & Communication Skills								
	International Experience & Communication Skills	Required	2 V + 2 S	4-6 ²⁾	4	6	2 pieces of coursework	n/a	English

Project Studies

	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	SWS	Credits	Type of examination	Duration of examination	Language of instruction
	Project Studies								
	Project Studies	Required		5 ²⁾		12	Project work		English

Bachelor's Thesis

	Module name	Type of module	Type of instruction SWS/ V Ü P	Sem .	SWS	Credits	Type of examination	Duration of examination	Language of instruction
	Bachelor's Thesis								
	Bachelor's Thesis	Required		6 ²⁾		12			English

Key:

Sem. = Semester; SWS = *Semesterwochenstunden* (weekly hours per semester); V = *Vorlesung* (lecture); Ü = *Übung* (exercise); P = *Praktikum* (internship), Se = Seminar. For written/oral examinations, the column "Duration of Examination" gives the length of the examination in minutes.

Notes:

²⁾ This module can be stretched over two semesters or more.

III. Curriculum – broken down for each Specialization in Technology

Semester 1		Chemistry	Electrical and Inform. Tech.	Informatics	Mechanical Engineering	Computer Engineering	Renewable Resources	Ideal curriculum
	Mathematik I/Mathematics I	6	6	6	6	6	6	6
	Basics in Economics	6	6	6	6	6	6	6
	Basics in Business	18	18	18	18	18	18	18
<i>Total credits</i>		30	30	30	30	30	30	30
Semester 2								
	Specialization in Technology	6	6	5	6	6	6	6
	Basics in Economics	6	6	6	6	6	6	6
	Basics in Business	12	12	12	12	12	12	12
	Statistik/Statistics	6	6	6	6	6	6	6
<i>Total credits</i>		30	30	29	30	30	30	30
Semester 3								
	Specialization in Technology	6	11	12	11	12	12	12
	Basics in Law	6	6	6	6	6	6	6
	Basics in Business	12	12	12	12	12	12	12
	Elective in Management and Technology	6	0	0	0	0	0	0
<i>Total credits</i>		30	29	30	29	30	30	30
Semester 4								
	Specialization in Technology	12	10	6	8	6	6	12
	Basics in Law Wirtschaftsprivatrecht II	6	6	6	6	6	6	6
	Basics in Business	12	12	12	12	12	12	12
	Elective in Management and Technology	0	3	6	3	6	6	0
<i>Total credits</i>		30	31	30	29	30	30	30
Semester 5								
	Specialization in Technology	6	10	12	10	10	12	6
	Elective in Management and Technology	12	6	6	6	6	6	12
	International Experience & Communication Skills ²⁾	0	3	0	3	3		0
	Project Studies ²⁾	12	12	12	12	12	12	12
<i>Total credits</i>		30	31	30	31	31	30	30
Semester 6								
	Specialization in Technology	12	5	7	7	10	6	6
	Elective in Management and Technology	0	9	6	9	6	6	6
	International Experience & Communication Skills ²⁾	6	3	6	3	3	6	6
	Bachelor's Thesis ²⁾	12	12	12	12	12	12	12
<i>Total credits</i>		30	29	31	31	31	30	30