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**Academic and Examination Regulations for the
Master's Degree Program in Chemical Biotechnology
at the Technical University of Munich**

dated 19 August 2019

In accordance with Art. 13(1) Sentence 2 in conjunction with Art. 58(1) Sentence 1, Art. 61(2) Sentence 1 and Art. 43(5) of the Bavarian Higher Education Act [*Bayerisches Hochschulgesetz (BayHSchG)*] the Technical University of Munich issues the following Regulations:

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§ 34

Applicability, Academic Titles

- (1) ¹The Examination and Academic Regulations for the Master's Program in Chemical Biotechnology (FPSO) complement the General Academic and Examination Regulations for Bachelor's and Master's programs at the Technical University of Munich (APSO) dated 18 March 2011 as amended. ²The APSO has precedence.
- (2) ¹Upon successful completion of the master's examination, the degree "Master of Science" ("M.Sc.") is awarded. ²The academic title may also be used with the name of the university ("TUM").

§ 35

Commencement of Studies, Standard Duration of Study, ECTS

- (1) Admission to the Master's Program in Chemical Biotechnology at the Technical University of Munich is possible both in the winter and in the summer semester.
- (2) ¹90 credits in required and elective subjects are needed to obtain the master's degree (70 weekly hours per semester) spread over three semesters. ²In addition, a maximum of six months are given to complete the master's thesis in accordance with § 46 and the master's colloquium. ³Thus, the number of examination requirements in required and elective subjects according to Appendix 1 to be completed in the Master's Program in Chemical Biotechnology is a minimum of 120 credits. ⁴The standard duration of study for the master's program will be a total of four semesters.

§ 36

Eligibility Requirements

- (1) Eligibility for the Master's Program in Chemical Biotechnology 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 an at least equivalent degree in Chemical Biotechnology, Biochemistry, Biochemical Engineering, Chemical Process Engineering or a comparable degree program (the bachelor's degree should cover two of these three areas: biology, chemistry and engineering).
 2. adequate knowledge of the English language; students whose native 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, 12 credits were obtained for examinations administered in English-language examination modules, the thesis was written in English, adequate proficiency in English is deemed proven.
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 3. passing the Aptitude Assessment in accordance with Appendix 2.
- (2) A degree is considered a qualified degree within the meaning of Subsection 1 if there are no significant differences with regard to the competencies (learning outcomes) acquired in the scholarly oriented bachelor's programs at TUM or in comparable degrees specified in Subsection 1, No. 1, and if these outcomes correspond to the subject-specific requirements of the master's degree program in Chemical Biotechnology.

- (3) ¹The required modules of the bachelor's degree program in Chemical Biotechnology are used as benchmarks for the determination in accordance with Subsection 2. ²If examination requirements are determined to be missing, the Aptitude Assessment Commission can require, in accordance with Appendix 2 No. 3, that these examinations are to be completed as additional fundamentals exams as specified in Appendix 2 No. 5.1.3 to demonstrate the qualification defined in Subsection 1. ³The applicants to university are to be informed of this after the review of their application documents in the first stage of the aptitude assessment.
- (4) The comparability of programs, subject-specific aptitude, as well as the equivalence of degrees acquired at foreign institutions will be decided upon by the Aptitude Assessment Commission in compliance with Art. 63 of the Bavarian Higher Education Act [*BayHSchG*].
- (5) ¹In deviation from Subsection 1 No. 1, students enrolled in a bachelor's degree program mentioned in Subsection 1 No. 1 may be admitted to the master's degree program upon the student's well-founded request. ²Students may apply only if they have completed module examinations covering at least 140 credits at the time of application. ³Students must provide proof of completion of their bachelor's degree within one year of beginning the master's degree program.

§ 37

Modular Structure, Module Examination, Courses, Areas of Specialization, Language of Instruction

- (1) ¹General provisions concerning modules and courses are set forth in §§ 6 and 8 of the APSO. ²For any changes to the stipulated module provisions, § 12(8) of the APSO applies.
- (2) The curriculum listing the required and elective modules is included in Appendix 1.
- (3) ¹As a rule, the language of instruction in the master's degree program in Chemical biotechnology is English. ²Individual modules taught entirely or partly in German are designated as such in Appendix 1. ³Students who have not verified their knowledge of German in the application process will be conditionally admitted with the stipulation that they complete at least one module in which they acquire integrative knowledge of German by the end of the second semester of enrollment in the degree program. ⁴The offer will be announced by the Examination Board accordingly. ⁵Optional achievements completed in extracurricular courses, e.g. German courses offered by the Language Center, will also be recognized.

§ 38

Examination Deadlines, Academic Progress Checks, Failure to Meet Deadlines

Examination deadlines, academic progress checks, and failure to meet deadlines are governed by § 10 of the APSO.

§ 39

Examination Board

In accordance with § 29 of the APSO, the board responsible for decisions concerning examination matters is the Master's Examination Board at the TUM Campus Straubing for Biotechnology and Sustainability.

§ 40

Recognition of Periods of Study, Coursework, and Examination Results

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

§ 41

Continuous Assessment Procedure, Types of Assessment

- (1) In addition to written examinations (*Klausuren*) and oral examinations, types of assessment in accordance with § 12 and § 13 of the APSO in this degree program may include (but are not limited to) laboratory assignments, practical credit requirements (tests, where applicable), reports, project work, presentations, and research papers.
- a) ¹A **Klausur** is a supervised written examination. In 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. ²The duration of *Klausuren* is provided for in § 12(7) of the APSO.
 - b) ¹Depending on the discipline, **laboratory assignments** may include experiments, measurements, field work, field exercises, etc. with the goal of students conducting such work, evaluating results and gaining knowledge. ²These may consist of, for example, process descriptions and the underlying theoretical principles including studying the relevant literature; preparation and practical implementation; calculations, if required, and documentation, evaluation, and interpretation of the results in the context of the knowledge to be gained. ³Laboratory assignments may be complemented by presentations designed to demonstrate a student's communication competency in presenting scholarly work to an audience. ⁴Details of each laboratory assignment and the competencies to be assessed in each examination are set out in the module descriptions.
 - c) ¹**Practical credit requirements (tests where applicable)** involve students completing assigned tasks (for example, solving mathematical problems, writing computer programs, preparing models) using theoretical knowledge to solve application-oriented problems. ²Practical credit requirements are designed to assess a student's factual and detailed knowledge and its application. ³Practical credit requirements may be carried out 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 credit requirement and the competencies to be assessed in each examination 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. ³Details of each project work and the competencies to be assessed in each examination are set out in the module descriptions. ⁴Project work may also be completed in the form of group work.

⁵In group work, students are expected to demonstrate that they can solve problems as a team. ⁶Each student's contribution to be assessed as an examination requirement must be clearly and individually recognizable and assessable. ⁷This also applies to their individual contributions to the group outcome.

- 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 relevant 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 [*Thesenpapier*], abstract, essay, 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. ⁵Details of each research paper and the competencies to be assessed in each examination are set out in the module descriptions.
- 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 topics or results and paring complex problems down to their essential core. ²In the presentation, the student is expected to demonstrate that he or she is 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, the student is expected to demonstrate that he or she is able to respond competently to any questions, suggestions or discussions brought by the audience and relating to the subject area. ⁴The presentation may be complemented by a brief written précis. ⁵The presentation may take the form of an individual or a group achievement. ⁶Each student's contribution to be assessed as an examination requirement must be clearly and individually recognizable and assessable. ⁷This also applies to their individual contributions to the group outcome.
- 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 achieved the qualification objectives documented in the module descriptions and understood the central concepts of the subject matter covered by the exam and are able to apply them to specific problems. ³The oral exam may take the form of an individual or a group achievement. ⁴The duration of the examination is regulated in § 13(2) of the APSO.
- (2) ¹The module examinations will, as a rule, be taken concurrently with the degree program. ²The type and duration of module examinations is stipulated in Appendix 1. ³For any changes to the stipulated module provisions, § 12(8) of the APSO applies. ⁴The assessment of the module examination is governed by § 17 of the APSO. ⁵The grade weights of module examination components correspond to the weighting factors assigned to them in Appendix 1.
- (3) If it is specified in Appendix 1 for a module examination that it is a written or oral exam, the examiner informs the students about the required type of examination at the latest on the first day of classes.
- (4) At the request of the students and with the consent of the examiners, examinations for German-language modules may be taken in a foreign language.

§ 42

Registration for and Admission to the Master's Examination

- (1) ¹Students who are enrolled in the master's program in Chemical Biotechnology are deemed admitted to the module examinations of the master's examination. ²If students are required to complete fundamentals examinations in accordance with Appendix 2 No. 5.1.3, then they must be informed in writing by the Examination Board for which module examination proof of completing the fundamentals examinations is a requirement for admission to the module examination, in derogation from Sentence 1.
- (2) ¹Registration requirements for required and elective module examinations are stipulated in § 15(1) of the APSO. ²The registration requirements for repeat examinations for failed required/required elective modules are stipulated in § 15(2) of the APSO.

§ 43

Scope of the Master's Examination

- (1) The master's examination consists of:
 1. the module examinations in the relevant modules in accordance with Subsection 2;
 2. the master's thesis in accordance with § 46,
 3. the master's colloquium in accordance with § 46 a.
- (2) ¹The module examinations are listed in Appendix 1. ²40 credits must be completed in the required modules and at least 50 credits in the elective modules. ³The selection of modules must comply with § 8(2) of the APSO.

§ 44

Repeat Examinations, Failed Examinations

- (1) ¹The repetition of examinations is governed by § 24 of the APSO. ²§24 (4) Sentence 5 of the APSO applies to repeat examinations of module examination components for modules lasting at least two semesters which a student has failed.
- (2) Failure of examinations is governed by § 23 of the APSO.

§ 45

Coursework

No pass/fail coursework is required for the completion of modules in the Master's Degree Program in Chemical Biotechnology.

§ 45 a

Multiple Choice Tests

The conduct of multiple choice tests is governed by § 12 a of the APSO.

§ 46 Master's Thesis

- (1) ¹As part of the master's examination, each student must write a master's thesis in accordance with § 18 of the APSO. ²The thesis topic may be determined and the master's thesis supervised by expert examiners (*Themensteller/Themenstellerin*) of the TUM Campus Straubing for Biotechnology and Sustainability.
³Expert examiners as stipulated in Sentence 2 are appointed by the Examination Board.
- (2) ¹Completion of the master's thesis module, as a rule, is the final examination requirement. ²Upon request students may be granted early approval to commence work on the master's thesis if they have completed at least 60 credits in the master's degree program and if the objective of the thesis in the sense of § 18(2) APSO can be fulfilled under consideration of the progression of studies to date.
- (3) ¹The period of time between topic determination and submission of the completed master's thesis must not exceed 6 months. ²The master's thesis is considered submitted and failed if the student fails to submit it on time without valid reasons as specified in § 10(7) of the APSO. ³The master's thesis must be written in English. ⁴It is to be preceded by a summary in German.
- (4) ¹Completion of the master's thesis consists of a written research paper and the master's colloquium in accordance with § 46 a. ²The master's thesis module is worth 30 credits.
- (5) ¹If the master's thesis module was not graded as at least "sufficient" (4.0), it may be repeated once with a new topic. ²Students must renew their application to prepare the master's thesis module within six weeks of receipt of the grade.

§ 46 a Master's Colloquium

- (1) ¹In the master's thesis module, students are considered registered for the master's colloquium if they have completed at least 60 credits in the master's degree program and have successfully completed the master's thesis. ²The examination must take place at most two months after the registration date determined in accordance with Sentence 1.
- (2) The master's colloquium is to be conducted by the supervisor of the master's thesis as well as a competent test supervisor.
- (3) The master's colloquium is to be conducted in German or English, as requested by the student.
- (4) ¹As a rule, the duration of the master's colloquium is 60 minutes. ²Approx. 30 minutes is allotted to present the master's thesis. ³This is followed by a thesis defense beginning with the topic of the master's thesis and covering the broader field in which the master's thesis is situated.

§ 47 Passing and Assessment of the Master's Examination

- (1) The master's examination is deemed passed when all examinations required for the master's examination in accordance with § 43(1) have been passed and a plus credits account of at least 120 credits has been achieved.

(2) ¹The module grade will be determined according to § 17 of the APSO. ²The overall grade for the master's examination will be calculated as the weighted grade average of the modules according to § 43(2) and the master's thesis as well as the master's colloquium. ³The grade weights of the individual modules correspond to the credits assigned to each module.

⁴The overall assessment is expressed by the designation in accordance with § 17 of the APSO.

§ 48

Degree Certificate, Diploma, Diploma Supplement

¹If the master's examination is passed, a degree certificate, a 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 of the graduation certificate is the date on which all examination requirements have been fulfilled and coursework completed.

§ 49

Entry into Force

(1) ¹These regulations will enter into force on 1 April 2019. ²They apply to all students who commence their studies at the Technical University of Munich as of the winter semester 2019/2020.

APPENDIX 1: Examination Modules

No.	Module title	Type of instruction SWS V S Ü P	Sem.	SWS	Credits	Type of examination	Duration of examination	Weighting factor ¹	Language of instruction
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Required modules

CS0007	Applied Microbiology and Metabolic Engineering	V P	1	2 V 2 P	5	S+ L (SL)	90		English
CS0009	Enzymatic Biotransformations	V Ü	1	2 V 1 Ü	5	S	90		English
CS0011	Conceptual Design of Bioprocesses	V Ü	1	2 V 2 Ü	5	S	60		English
CS0012	Artificial Intelligence for Biotechnology	VI	1	4 VI	5	S	90		English
CS0013	Advanced scientific planning based on current research topics at TUM	S	2	3 S	5	W			German and English
CS0014	Research Internship Master Chemical Biotechnology	P	3	15	15	B + L (SL)			German and English
	Total:			33	40				

CS0015	Master's Thesis with Master's Colloquium	P		30	30				
	Master's Colloquium		4			M	60	1:6	German or English
	Master's Thesis		4			W		5:6	English

Subject-specific elective modules: elective modules from the following list and totaling at least 44 credits must be completed (the Examination Board updates the catalog of subjects of the elective modules continuously. Changes will be announced at the latest at the beginning of the semester):

CS0008	Enzyme Engineering	V P		2 V 2 P	5	S + B	60	2:1	English
CS0006	Genetic Engineering and Synthetic Biology	V S		2 V 2 S	5	S + PP (SL)	90		English
CS0016	Methods of Synthetic Biology	P	WiSe	5 P	5	L			German and English
CS0017	Regulation of Microbial Metabolism	V	SoSe	2 V	3	S	60		German and English
CS0018	Plant Biotechnology	V S	WiSe	1 V 1 S	3	S + PP	45	1:1	English
CS0019	Chemistry of Enzymes	V S		2 V 1 S	5	S	60		English
CS0020	Glycomics	V Ü	SoSe	1 V 2 Ü	3	S	60		German and English
WZ1191	Phytopharmaceuticals and natural products	V P	SoSe	2 V 1 P	5	S	60		German
CS0021	Surface Chemistry	V Ü	WiSe	1 V 0.5 Ü	3	S	60		German

¹Please indicate weighing factors

WZ1157	Sustainable Chemistry	V S	SoSe	2 V 1 S	5	S + PP (SL)	60		German and English
CS0010	Advanced Downstream Processing	V Ü		2 V 2 Ü	5	S	60		English
CS0022	Electrolyte thermodynamics	V Ü	WiSe	1.5 V 0.5 Ü	3	M	25		English
CS0023	Gas-based bioprocesses	V Ü		2 V	3	S	60		German and English
WZ1189	Mechanical process engineering	V Ü	WiSe	2 V 2 Ü	5	S	60		German
CS0024	Electrobiotechnology	V Ü		2 V 2 Ü	5	S	90		English
WZ1290	Biological materials in nature and technology	V	SoSe	4 V	5	S	90		German
WZ1210	Materials science of renewable resources	V Ü	WiSe	2 V 1 Ü	3	S	90		German
CS0025	Advanced Analytics for Biotechnology	V S	SoSe	2 V 1 S	5	S + PP (SL)	60		English
CS0026	Advanced Concepts of Bioinformatics	VI	SoSe	4 VI	5	S	90		English

General education/interdisciplinary elective modules: elective modules from the following list and totaling at most 6 credits must be completed (this catalog includes interdisciplinary course offerings. Students can obtain the credits in modules offered by other TUM schools and departments or institutions of higher education.

WZ1209	Applied ethics at regrowing resources	V Ü	WiSe	1 V 1 Ü	3	S	60		German
WZ1167	Work Science and Occupational Safety	V Ü	SoSe	1 V 1 Ü	3	S	60		German
WZ1139	Consultancy and Communication	V Ü	WiSe	2 V 2 Ü	5	S	90		German
WZ1181	Corporate Sustainability Management	S	SoSe	2 S	3	S	60		German
WZ9118	English	V	WiSe	2 V	3	M	20		English
WZ9120	Leadership Psychology	V	WiSe	2 V	3	S	60		German
WZ1120	Medicinal and spice plants	V Ü	SoSe	2 V 1 Ü	5	S + PP (SL)	60		German and English
WZ1142	Renewable Resources at Schools	V Ü	SoSe	2 V 2 Ü	5	PP			German
WZ9121	Rhetoric and Dialectic	V	SoSe	2 V	3	M	20		German
WZ1146	Social Media Marketing	V S	SoSe	1 V 1 S	3	M	30		German
WZ9119	Spanish	V	SoSe	2 V	3	S	60		Spanish

Explanations:

Sem. = semester; SWS = Semesterwochenstunden/weekly hours per semester; V = Vorlesung/lecture; Ü = Übung/exercise; P = Praktikum/internship; WiSe = winter semester; SoSe = summer semester

S = Klausur/written exam; L = Laborleistung/laboratory assignment; M = mündlich/oral; PA = Projektarbeit/project work; PP = Präsentation/presentation; B = Bericht/report; W = Wissenschaftliche Ausarbeitung/research paper; ÜL = Übungsleistung/practical credit requirement; SL = Studienleistung/coursework

In the column "Duration of examination", the duration of written and oral examinations is specified in minutes.

Credit total for each semester:

Semester	Credits required modules	Credits elective modules	Credits Master's Thesis	Total Credits	Number of exams
1	20	10		30	6
2	5	25		30	6
3	15	15		30	4
4			30	30	1
Total	40	50	30	120	17

APPENDIX 2: Aptitude Assessment

Academic and Examination Regulations

for the Master's Program in Chemical Biotechnology

at the Technical University of Munich

1. Purpose of the Process

¹Eligibility for the master's degree program Chemical Biotechnology, in addition to the requirements specified in § 36 (1) Nos. 1 and 2, requires proof of aptitude in accordance with § 36 (1) no. 3 in accordance with the following provisions. ²The special qualifications and skills of the candidates should correspond the field of Chemical Biotechnology. ³The individual aptitude parameters are:

- 1.1 ability to do research work and/or basic research and methodological work;
- 1.2 specialist knowledge from a bachelor's degree program in the field of Chemical Biotechnology, Biochemistry, Chemical Process Engineering or a comparable degree program (the bachelor's degree should cover two of these three areas: biology, chemistry and engineering),
- 1.3 ability to and interest in learning new specialist knowledge and methodological approaches efficiently
- 1.4 ability to efficiently apply theoretical knowledge in practice and
- 1.5 practical experience in the general field of future work.

2. Aptitude Assessment Process

2.1 The Aptitude Assessment Process is conducted semi-annually by the TUM Campus Straubing for Biotechnology and Sustainability.

2.2 ¹Applications for admission to the aptitude assessment process for the winter semester must be submitted to the Technical University of Munich together with the documents listed in 2.3.1 through 2.3.5 no later than 31 May and for the summer semester by 15 January (absolute deadlines) using the online application process.

2.3 The application must include:

2.3.1 A transcript of records containing modules amounting to at least of 140 credits. the transcript of records must be issued by the relevant examination authority or academic programs office

2.3.2 a description of the curriculum on which the bachelor's degree program was based and which indicates the contents of the modules and the competencies gained (e.g., module catalog, module descriptions) and the form provided by the TUM Campus Straubing for Biotechnology and Sustainability listing the grades, credits and semester hours per week of the relevant modules (examination requirements)

2.3.3 curriculum vitae formatted as a table;

2.3.4 a written essay of at most one to two A4 pages giving the reasons for selecting the degree program in Chemical Biotechnology at the Technical University of Munich in which applicants explain their exceptional motivation on the basis of which they consider themselves particularly suitable for the master's degree program in Chemical Biotechnology at the Technical University of Munich; the applicant's exceptional motivation for and commitment is to be demonstrated, for example by providing details on program-related vocational training, internships, stays abroad, or program-related

further education beyond the attendance and course requirements of the bachelor's program. This is to be evidenced by material provided as appendices, as appropriate.

- 2.3.5** a declaration that the essay is the applicant's own work, and that the applicant has clearly identified any ideas taken from outside sources.

3. Aptitude Assessment Commission, Selection Committees

- ¹Aptitude assessment is administered by the Aptitude Assessment Commission and the Selection Committees. ²The Commission is responsible for preparing the aptitude assessment process, organizing it and ensuring a structured and standardized process for determining aptitude within the framework of these Regulations; it bears responsibility, insofar as no other body is specified by these Regulations or through delegation of its authority to another body. Selection Committees are to conduct the assessment process in accordance with Nr. 5 subject to Nr. 3.2 Sentence 11.
- 3.2** ¹The Commission consists of five members. ²Members of the Commission are appointed by the Rector, in consultation with the Study Dean, from among the authorized examiners of the Integrative Research Center TUM Campus Straubing für Biotechnologie und Nachhaltigkeit, who are members of the degree program faculty. ³Commission members must be university educators within the meaning of the Bavarian Act on Higher Education Staff (BayHSchPG). ⁴The Departmental Student Council has the right to name a student representative to serve on the Commission in an advisory capacity. ⁵A deputy is to be appointed for each member of the Commission. ⁶The Commission elects a chairperson and a deputy chairperson from among its members. ⁷Procedures are governed by § 30 of the TUM Charter as last amended. ⁸The term in office of Commission members is 4 years. ⁹Extensions of the term of office and reappointments are possible. ¹⁰Urgent decisions that cannot be postponed can be made by the chairperson on behalf of the Commission; He/She must inform the Commission of such decisions without delay. ¹¹The Academic Programs Office supports the Commission and the Selection Committee; the Commission may delegate to the Office the task of assessing formal admissions requirements in accordance with Nr. 4, as well as the determination of points to be awarded based on defined criteria for which there is no freedom of discretion involved. This includes, in particular, the conversion of grades and the calculation of the overall points earned by the applicant. The Office may also be involved in choosing the members of the Selection Committee from among the commissioners and assigning them to applicants.
- 3.3** ¹Each Selection Committee consists of two members of the Integrative Research Center TUM Campus Straubing for Biotechnology and Sustainability, who are authorized to conduct examinations in the degree program according to Art. 62(1) Sentence 1 of the Bavarian Higher Education Act [BayHSchG] in conjunction with the act governing examiners at institutions of higher education [*Hochschulprüferverordnung*]. ²At least one member must be university educators within the meaning of the Bavarian Act on Higher Education Staff (BayHSchPG). ³It is permissible to serve concurrently on both the Aptitude Assessment Commission and the Selection Committee. ⁴Members of the Committee are appointed by the Commission for a term of 1 year; Nr. 3.2 Sentence 9 applies accordingly. ⁵Different Selection Committees may be assigned to individual criteria and stages of the assessment process.

4. Admission to the Aptitude Assessment Process

- 4.1** Admission to the aptitude assessment process requires that all documentation specified in no. 2.3 has been submitted in a timely and complete fashion.
- 4.2** ¹ Applicants who have fulfilled the requirements according to No. 4.1 will be assessed according to No. 5. ² Applicants not admitted to Aptitude Assessment will receive a letter of rejection stating the grounds for rejection and informing them of legal remedies.

5. The Aptitude Assessment Process

First Stage

5.1.1 ¹It will be assessed, on the basis of the written application documents required under no. 2.3, whether or not an applicant is suitable for a program pursuant to no. 1 (First stage of the aptitude assessment process). ²The candidate's application documents will be evaluated on a scale ranging from 0 to 100 points, 0 being the worst and 100 the best possible result.

The following criteria will be applied to the evaluation:

a) Discipline-Specific Skills and Qualifications

¹The curricular analysis is conducted on the basis of competencies, rather than a schematic comparison of modules. ²The analysis is based on the fundamental subject groups listed in the following table of the bachelor's program in Chemical Biotechnology at the Technical University of Munich.

Academic subject area	Credits TUM
Core subjects (Mathematics, physics, statistics, fundamentals of computer science)	20
Chemistry (General chemistry, physical chemistry, practical course in general chemistry, fundamentals of organic chemistry, practical course in organic chemistry, instrumental analytics and spectroscopy, advanced organic chemistry)	39
Molecular Biology (Cell and microbiology, practical course microbiology, bioinformatics, biochemistry, practical course biochemistry, molecular biology and genetics, enzymes and their reactions)	40
Process Engineering (Chemical thermodynamics and mass transport, chemical reaction engineering, thermal separation principles, practical course process engineering, biochemical engineering, practical course biochemical engineering, process design project)	35
Total	134

³If it is established that there are no significant differences in the competencies acquired (learning outcomes), a maximum of 35 points will be awarded. ⁴The number of points is calculated by dividing the total number of credits from the modules/grade reports of courses and exams passed from the applicant's bachelor's degree program included in the fundamental group of subjects of the bachelor's degree program in Chemical Biotechnology by the quotient 134/35, whereby 35 is the greatest possible number of points. ⁵If this value is not a whole number, it will be rounded up.

b) Final Grade

¹The applicant will be awarded 1.5 points for each tenth that the average calculated from examinations in the amount of 140 credits is better than 4.0. ²The maximum number of points is 45. ³Negative points will not be awarded. ⁴Grades of international degrees will be converted by applying the Bavarian formula.

⁵If the candidate has submitted a degree certificate containing more than 140 credits with the application, the assessment will be made on the basis of the best graded modules in the amount of 140 credits. ⁶The applicant needs to submit a list of the results together with the application and confirm its accuracy in writing.

⁷If the candidate submits this list, the average is calculated from graded module examinations with the best grades amounting to 140 credits; if no list is submitted, the overall average of grades submitted by the candidate will be used to calculate the average. ⁸The overall grade average is calculated as a weighted grade average. ⁹The grade weights of the individual modules correspond to the credits assigned to each module. ¹⁰In the process of determining grades, only the first digit after the decimal point is taken into account. All other digits are dropped without rounding.

c) Letter of motivation

¹The applicant's written statement will be evaluated by two members of the Selection Committee and graded on a scale of 0 – 20 points. ²The content will be assessed using the following criteria:

1. ability to apply rules of German and English grammar and spelling,
2. ability to formulate his/her reasons for applying in a factual and objective manner,
3. ability to describe the relationship between their personal interests and the content of the degree program in a well-structured manner.
4. Convincing demonstration of particular motivation for the master's degree program supported by arguments and meaningful examples (see 2.3.4.).
5. ability to linguistically emphasize important points of their reasoning in an appropriate way.

³Committee members independently assess each of the 5 criteria with equal weighting. ⁴The points total will be calculated as the arithmetic mean of the individual assessments, rounded up to the nearest full point.

5.1.2 ¹The points total in the first stage will be calculated as the sum of the individual evaluations. ²Decimal places must be rounded up.

5.1.3 ²Applicants with at least 70 points will be deemed suitable. ²In those cases where it is determined that only some subject-specific requirements for the master's program are missing from undergraduate studies, the Selection Committee may require that applicants complete fundamentals exams from the bachelor's degree program in Chemical Biotechnology amounting to a maximum of 30 credits. ³These fundamentals exams must be successfully completed in the first year of study. ⁴Failed fundamentals exams may be repeated only once and at the next examination date. ⁵The Examination Board may make the admission to individual module examinations dependent on the successful completion of the fundamentals exam.

5.1.4 Applicants who have achieved less than 50 points fail the aptitude assessment.

5.2 Second Stage:

5.2.1 ¹The remaining applicants will be invited to an aptitude assessment interview. ²During the second stage of the aptitude assessment, both skills acquired during the applicant's bachelor's studies and the result of the assessment interview will be assessed. ³Interview appointments will be announced at least one week in advance. ⁴Time slots for interviews must be scheduled before expiration of the application deadline. ⁵The interview appointment must be kept by the applicant. ⁶Conducting the aptitude assessment interview via video conference is possible upon a student's well-founded request. ⁷The applicant bears the risk in the event of any technical problems, unless these are attributable to the Technical University of Munich. ⁸If the applicant is unable to attend an aptitude assessment interview due to reasons beyond his/her control, a later appointment may be scheduled upon a student's well-grounded request, but no later than two weeks before the beginning of classes.

5.2.2 ¹The aptitude assessment interview is to be held individually for each applicant. ²The interview lasts at least 20 but not more than 30 minutes for each applicant. ³The interview will focus on the following topics:

1. Exceptional motivation for the master's degree program in Chemical Biotechnology according to the criteria for assessing the written statement of purpose mentioned in No. 2.3.3,
2. fundamental and applied questions in the field of Chemical Biotechnology, to assess the applicant's discipline-specific qualification,
3. assessment of the applicant's aptitude profile,
4. ability to efficiently apply theoretical knowledge in practice.

⁴The above topics may cover the documentation submitted pursuant to 2.3. ⁵Any subject-specific academic knowledge that is to be taught in the master's degree program in Chemical Biotechnology will not affect the decision. ⁶With the applicant's approval, a representative of the student body may sit in on the interview.

5.2.3 ¹The aptitude assessment interview will be conducted by two members of the Selection Committee. ²Committee members independently assess each of the four areas with equal weighting. ³Each member will grade the result of the interview on a scale from 0 to 60, 0 being the worst and 60 being the best possible result. ⁴The points total will be calculated as the arithmetic mean of the individual evaluations. ⁵Non-vanishing decimal places must be rounded up.

5.2.4 ¹The total number of points awarded in stage 2 is the sum of the points from 5.2.3 and the points from 5.1. 1 a) subject-specific qualification) and 5.1.1 b). ²Applicants with 70 or more points will be deemed suitable.

5.3 Determination and Notification of Results

¹Applicants will be informed of the results of the aptitude assessment through official notification. ³Applicants not suited for the program will receive a letter of rejection stating the grounds for rejection and informing them of legal remedies.

5.4 Candidate's suitability for the program, once determined in aptitude assessment, applies to all subsequent applications for this program.

6. Documentation

¹The aptitude assessment process must be documented, in particular the names of the participating members of the Selection Committee, the evaluation of the first and second stages, as well as the overall results. ²The aptitude assessment interview must be documented, including the date, duration and location of the assessment, the names of the participating Selection Committee members, the applicant's name, and a list of main topics of discussion in bullet points

7. Repeat Aptitude Assessments

Applicants who have failed an aptitude assessment may apply once to repeat the aptitude assessment process.

Executed following a resolution of the Senate of the Technical University of Munich dated 20 March 2019 and approval of the President of the Technical University of Munich dated 19 August 2019.

Munich, 19 August
2019 Technical
University of
Munich

Wolfgang Hermann
President

These Regulations were made available for inspection at the Technical University of Munich on 19 August 2019, following their announcement on 19 August 2019. Day of proclamation is therefore be 19 August 2019.