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Academic and Examination Regulations for the Master's Degree Program Earth Oriented Space Science and Technology at the Technical University of Munich

Dated 5 May 2015

Engrossed version
as amended by the Amending Statutes of 29 June 2020

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) [1]The Examination and Academic Regulations for the Master's Degree Program Earth Oriented Space Science and Technology (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 last amended. [2]The APSO has precedence.

(2) [1]Upon successful completion of the Master's examination, the degree "Master of Science" ("M.Sc.") is awarded. [2]The academic title may also be used with the name of the university "(TUM)".

§ 35
Commencement of Studies, Standard Duration of Study, ECTS

(1) The Master's Degree Program Earth Oriented Space Science and Technology at the Technical University of Munich commences, as a rule, in the winter semester.

(2) [1]The number of classes in required and elective subjects needed to obtain the master's degree is 90 credits (70 weekly hours per semester) spread over three semesters. [2]Students will have a maximum of six months to complete their master's thesis in accordance with § 46. [3]The number of coursework and examination requirements in required and elective subjects to be completed in the Master's Program in Earth Oriented Space Science and Technology according to Appendix 1 is a minimum of 120 credits. [4]The standard duration of study for the master's program is a total of four semesters.

§ 36
Eligibility Requirements

(1) Eligibility for the Master's Degree Program Earth Oriented Space Science and Technology is demonstrated by

1. A qualified bachelor's degree obtained in a program of at least six semesters from a domestic or foreign institution of higher education, or at least an equivalent degree in natural sciences or engineering sciences;

2. Adequate knowledge of the English language; students whose language of instruction is not English must demonstrate proficiency through an acknowledged language test such as the Test of English as a Foreign Language (TOEFL) (with a minimum of 88 points), the International English Language Testing System (IELTS) (with a minimum of 6.5 points), or the Cambridge Main Suite of English Examinations; if, in the undergraduate program, 30 credits were obtained from examinations administered in English-language examination modules or if the thesis was written in English, adequate proficiency in English is also deemed proven;

3. Passing the aptitude assessment in accordance with Appendix 2.

(2) A degree is considered a qualified degree within the meaning of Section 1 if there are no significant differences with regard to the competencies (learning outcomes) acquired in the scholarly oriented TUM bachelor's programs specified in Section 1 Subsection 1, and if these outcomes correspond to the subject-specific requirements of the master's program.

(3) [1]For determining a qualified degree in accordance with Section 2, the required modules of the bachelor's program at the Technical University of Munich will be considered. [2]If students do not meet all credit requirements, the Commission can, in accordance with Appendix 2 Subsection 3, require students to verify their qualifications in accordance with Section 1 by completing additional fundamentals exams in accordance with Appendix 2 Subsection 5.1.3. [3]Applicants

must be informed of this after the documents have been examined during the first stage of the aptitude assessment process.

(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 Committee in compliance with Art. 63 of the Bavarian Higher Education Act (*BayHSchG*).

§ 37
Modular Structure, Module Examination, Courses, Areas of Specialization, Language of Instruction

(1) [1]General provisions concerning modules and courses are set forth in §§ 6 and 8 of the General Academic and Examination Regulations (*APSO*). [2]For any changes to the stipulated module provisions § 12(8) of the *APSO* shall apply.

(2) The curriculum with a list of the required and elective modules is included in Appendix 1.

(3) In the third semester of enrollment in the Master' Program in Earth Oriented Space Science and Technology, one of the following areas of specialization must be selected:
- Earth System Science from Space
- Remote Sensing
- Navigation

(4) [1]The language of instruction in the Master's Degree Program Earth Oriented Space Science and Technology is English. [2]Students 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. [3]The offer will be announced by the Examination Board accordingly. [4]Optional credits completed in extracurricular courses, e.g. German courses offered by the TUM Language Center, will also be recognized.

§ 38
Examination Deadlines, Academic Progress Checks, Failure to Meet Deadlines

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

(2) [1]At least five of the module examinations from the fundamentals listed in Appendix 1 must be successfully completed by the end of the second semester. [2]In the event of failure to comply with this deadline, § 10(5) of the *APSO* will apply.

§ 39 Examination Board

The Examination Board of Earth Oriented Space Science and Technology program in the TUM Department of Aerospace and Geodesy is responsible for all decisions concerning examination matters in accordance with § 29 of the General Academic and Examination Regulations (*APSO*).

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

The recognition of periods of study, coursework and examination requirements 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* may include (but are not limited to) laboratory assignments, practical credit requirements (tests where applicable), reports, project work, presentations, learning portfolios, research papers, and parcours examinations.

a) [1]A **written examination** is a supervised examination, in which 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. [2]The duration of written examinations (*Klausuren)* is provided for in § 12(7) of the *APSO*.

b) [1]Depending on the discipline, **laboratory assignments** may include experiments, measurements, field work, field exercises, etc.; they have the goal of students conducting such lab work, evaluating results, and gaining knowledge. [2]These may consist of, for example, process descriptions and 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. [3]Laboratory assignments may be complemented by presentations designed to demonstrate a student's communication competency in presenting scholarly work to an audience. [4]Details of each laboratory assignment and the related competencies to be examined are set out in the module descriptions.

c) [1]**Practical credit requirements (tests where applicable)** involve students completing assigned tasks (e.g., solving mathematical problems, writing computer programs, preparing models etc.) using theoretical knowledge to solve application-oriented problems. [2]Practical credit requirements are designed to assess a student's factual and detailed knowledge and its application. [3]Practical credit requirements may be carried out in writing, orally, or electronically. [4]This may be in the form of homework, exercise sheets, programming exercises, (digital) tests, tasks within the scope of university practical courses etc. [5]The specific parts of the respective practical credit requirements and the competencies to be examined are listed in the module description.

d) [1]A **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. [2]Students are expected to demonstrate that they have understood all essential aspects and are able to present them in writing. [3]Reports may include excursion reports, internship reports, work reports, etc. [4]The 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. [2]In addition, project work may include a presentation in order to assess a student's communication competency in presenting scholarly work to an audience. [3]Details on the respective project work and the related competencies to be examined are set out in the module descriptions. [4]The project work may also be in the form of group work. [5]Group work should demonstrate that the tasks can be solved in a team. [6]Each contribution to be assessed as an examination requirement must be clearly individually recognizable and assessable. [7]This also applies to an individual's contribution to the group results.

f) [1]A **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. [2]Students 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. [3]Research papers, differing in their requirement standards, may take the form of a conceptual framework/theory paper, abstract, term paper, seminar paper, etc. [4]A 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. [5]Details on the respective research paper and the related competencies to be examined are set out in the module descriptions.

g) [1]A **presentation** is a systematic and structured oral performance supported by suitable audio-visual equipment (such as projector, slides, posters, videos) for the purpose of demonstrating and summarizing specific issues or results and paring complex problems down to their essential core. [2]For 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. [3]In 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 that relate to his or her subject area. [4]The presentation may be complemented by a brief written précis. [5]The presentation can be given by one individual or as a group. [6]Each contribution to be assessed as an examination requirement must be clearly individually recognizable and assessable. [7]This also applies to an individual's contribution to the group results.

h) [1]An **oral examination** is a timed, graded discussion on relevant topics and specific questions to be answered. [2]In oral examinations students are expected to demonstrate that they have achieved the qualification goals documented in the module descriptions; they have understood the central concepts of the subject matters covered by the exam; and they are able to apply them to specific problems. [3]The oral exam can be taken as an individual examination or as a group examination. [4]The duration of the examination is regulated in § 13(2) of the General Academic and Examination Regulations (*APSO*).

i) [1]A **learning portfolio** is a collection of completed written work compiled by the student according to predefined criteria that exhibits the student's progress and achievements in defined content areas at a given time. [2]Students are required to explain why they chose the work they have and its relevance for their learning progress and the achievement of the defined qualification goals. [3]The learning portfolio should demonstrate that responsibility was assumed for the learning process and the qualification goals documented in the module description. [4]Depending on the module description, the types of independent study assessment in a learning portfolio may include, in particular, application-oriented assignments, web pages, weblogs, bibliographies, analyses, conceptual framework/theory papers, as well as the graphic representation of facts or problems. [5]Details on the respective learning portfolio and the related competencies to be examined are set out in the module descriptions.

j) [1]The **parcours examination** is made up of several components within one examination requirement. [2]Unlike a module examination component, parcours exam components are administered in sequence and completed in a specific time frame and location. [3]Parcours components entail various types of examination, which together evaluate the competency profile of the module as a whole. [4]Parcours components can also be types of examinations according to letters a) to i). [5]The total duration of the examination is to be indicated in the module catalog, and the type of examination and the time allotted to individual examination components are to be indicated in the module description.

(2) [1]The module examinations will, as a rule, be taken concurrently with the degree program. [2]The type and duration of module examinations are stipulated in Appendix 1. [3]If any changes are made

to the stipulated module provisions, § 12(8) of the *APSO* applies. [4]The assessment of the module examination is governed by § 17 of the *APSO*.

(3) At the request of the students and with the consent of the examiners, examinations may be taken in German or English for modules held in German and English.

§ 42
Registration for and Admission to the Master's Examination

(1) Students who are enrolled in the Master's Degree Program Earth Oriented Space Science and Technology are deemed admitted to the module examinations of the master's examination.

(2) [1]Registration requirements for required and elective module examinations are stipulated in § 15(1) of the *APSO*. [2]The registration requirements for repeating examinations for failed required modules are stipulated in § 15(2) of the *APSO*.

§ 43
Scope of the Master's Examination

(1) The master's examination consists of:

1. Module examinations in the relevant modules in accordance with Section 2;
2. The master's thesis in accordance with § 46.

(2) [1]The module examinations are listed in Appendix 1. [2]Students must verify 80 credits in required modules, of which 15 credits must come from the area of concentration they selected as their specialization and at least 10 credits from elective modules. [3]The selection of modules must comply with § 8(2) of the *APSO*.

§ 44
Repeat Examinations, Failed Examinations

(1) The retaking of examinations is governed by § 24 of the General Academic and Examination Regulations (*APSO*).

(2) Failing examinations is governed by § 23 of the *APSO*.

§ 45
Coursework Requirements

[1]Completing coursework requirements can also be required in elective modules in lieu of the examination requirements for elective modules set out in § 43(2) Sentence 2. [2]The number of credits required in terms of the examination requirements set out in § 43(2) Sentence 2 will be reduced accordingly if this is the case.

§ 45 a
Multiple Choice Tests

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

§ 46
Master's Thesis

(1) [1]As part of the master's examination, each student must write a master's thesis in accordance with § 18 of the General Academic and Examination Regulations (*APSO*). [2]The master's thesis can be approved and supervised by expert examiners at the Technical University of Munich (thesis supervisor). [3]The expert examiners stipulated in Sentence 2 are appointed by the Examination Board.

(2) [1]Completion of the Master's Thesis module, as a rule, is the final examination requirement. [2]Upon request, students may be granted early approval to commence work on their master's thesis if the objective of the thesis within the meaning set out in § 18(2) *APSO* can be fulfilled considering the student's progression of studies to date.

(3) [1]The period of time between determining a topic and submission of the master's thesis may not exceed six months. [2]The master's thesis is considered presented and not passed if the student fails to submit it on time without valid reasons as specified in § 10(7) of the *APSO*.

(4) The master's thesis is expected to be written in English.

(5) [1]To complete the Master's Thesis module, students must submit an academic research paper and give a presentation on its content. [2]The presentation does not affect the grading. [3]Thirty credits are awarded for completing the Master's Thesis module.

(6) [1]If the master's thesis was not graded with at least "sufficient" (4.0), it may be repeated once with a new topic. [2]Students must renew their application to retake the Master's Thesis module again within six weeks of receiving their grade.

§ 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) [1]The grade for the module will be determined according to § 17 of the General Academic and Examination Regulations (*APSO*). [2]The 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 module. [3]The grade weights of the individual modules correspond to the credits assigned to each module. [4]The overall assessment is expressed by the designation in accordance with § 17 of the *APSO*.

§ 48
Degree Certificate, Diploma, Diploma Supplement

[1]If the master's examination is passed, a degree certificate, a diploma and a diploma supplement with a transcript of records will be issued in compliance with § 25(1) and § 26 of the General Academic Examination Regulations (*APSO*). [2]The date on which all examination and coursework requirements have been completed is the date which will be indicated on the degree certificate.

§ 49
Double Degree

[1]The Technical University of Munich and Wuhan University offer a double degree program on the basis of a collaboration agreement. [2]The following special rules will apply to students who participate in this program:

1. [1]The order of events in the double degree program is regulated in a special agreement (collaboration agreement) between both universities. [2]Students can get more information about the cooperation agreement from the TUM Department of Aerospace and Geodesy.

2. [1]he selection of participants is undertaken in two stages. [2]First, potential participants are selected on the basis of their academic achievement in school and during their studies, their knowledge of the English language, and motivation. [3]The final selection is made on the basis of a personal interview with representatives of both universities.

3. [1]Students sent from Wuhan University complete the Master's Degree Program Earth Oriented Space Science and Technology in accordance with these examination regulations and the Academic and Examination Regulations (*APSO*). [2]The coursework and examination requirements that they have to complete at the Technical University of Munich are specified in the Collaboration Agreement.

4. [1]Students sent by TUM must complete 60 credits in their first two semesters in accordance with Appendix 1 in order to continue their third and fourth semesters at Wuhan University. [2]The coursework and examination requirements completed at Wuhan University will be recognized by the Technical University of Munich without any extra individual verifications required. [3]The coursework and examination requirements that they have to complete at Wuhan University are specified in the Collaboration Agreement. [4]In the fifth and sixth semester, students continue their studies at the technical University of Munich and complete the modules, which are normally intended for students in the third and fourth semester, in accordance with the Academic and Examination Regulations for the program.

5. In exception to § 46(1) Sentence 2, the Master's thesis can be written at either the Technical University of Munich or Wuhan University under the joint supervision of one examiner from the Technical University of Munich and one examiner from Wuhan University.

§ 50*)
Entry into Force

(1) [1]These regulations will enter into force on 1 April 2015. [2]They apply to all students who commence their studies at the Technical University of Munich as of the summer semester 2015.

(2) [1]At the same time, the Academic and Examination Regulations for the Master's Degree Program Earth Oriented Space Science and Technology at the Technical University of Munich dated 23 October 2009, and as last amended on 8 May 2013, cease to apply. [2]Students who already commenced their studies at the Technical University of Munich prior to the summer semester 2015 are to complete their studies in accordance with Sentence 1 of the regulations.

*) This provision concerns the entry of force of the original version of the regulations dated 5 Mai 2015. The point in time when the changes come into force are based on the amending statute.

Appendix 1: Examination Modules

No.	Module name	Type of instruction SWS	Sem.	SWS	Credits	Type of Exam	Duration of exam	Language Instructior
	Required Modules							
BGU45037	Introduction to Earth System Science	4V	1	4	5	Written Exam	120	English
BGU57018	Numerical Modeling	3V + 1Ü	1	4	5	Written Exam	120	English
BGU48036	Introduction to Photogrammetry, Remote Sensing and Digital Image Processing	4V + 1Ü	1	5	5	Written Exam	120	English
BGU31006	Signal Processing and Microwave Remote Sensing	1V + 3VI	1	4	5	Written Exam	75	English
BGU61030	Applied Computer Science	3V + 1Ü	1	4	5	Written Exam	90	English
BGU61029	Introduction to Satellite Navigation and Orbit Mechanics	2V + 2VI	1	4	5	Written Exam	120	English
BGU45041	Scientific Working in Earth Oriented Space Science and Technology	2V + 3S	2	5	5	Research paper		English
BGU45040	Applied Earth Observation	2V + 2S	2	4	5	Examination parcours		English
BGU61033	Satellite Navigation and Advanced Orbit Mechanics	2V + 3VI	2	5	5	Written Exam	120	English
BGU31007	Estimation Theory and Machine Learning	3V + 1Ü	2	4	5	Written Exam	60	English
BGU45042	Ground and Space Segment Control	2V + 2V	2	4	5	Written Exam	120	English
MW2412	Spacecraft Technology 1	3V + 1Ü	2	4	5	Written Exam	90	English
MW2413	Spacecraft Technology 2	3V + 1Ü + 1S	3	5	5	Written Exam	90	English
	Total:				**65 credits**			

Required modules for area of specialization 1: Earth System Science

BGU45038	Atmosphere and Ocean	2V + 2V	3	4	5	Written Exam	90	English
BGU57019	Geokinematics and Continental Hydrology	2V + 2V	3	4	5	Written Exam	120	English
BGU45039	Earth Observation Satellites	2V + 2Ü + 1S	3	5	5	Written Exam	90	English
	Total:				**15 credits**			

Required Modules for Area of Specialization 2: Remote Sensing

BGU48035	Photogrammetry	4V	3	4	5	Presentation		English
BGU69002	Remote Sensing	2VI + 2S	3	4	5	Examination parcours		English
BGU30062	Geoinformation	3VI	3	3	5	Written Exam	60	English
	Total:				**15 credits**			

Required Modules for Area of Specialization 3: Navigation

BGU61034	Precise GNSS	2Ü + 3VI	3	5	5	Written Exam	120	English
BGU61031	Advanced Aspects of Navigation Technology	2V + 2S	3	4	5	Written Exam	120	English
BGU61032	Navigation Labs	4Ü	3	4	5	Laboratory assignment		English
	Total:				**15 credits**			

BGUMTES 19	Master's Thesis		4		30	Research paper		

Elective modules (modules selected for the area of specialization cannot be taken as electives)

- A minimum of 10 credits must be obtained from the elective modules from this list.
- The Examination Board ESPACE continuously updates the subject catalog for elective modules and announces this as well as the examination details on the homepage of the ESPACE Master's Program at the latest by the beginning of the semester.
- Upon request and subject to approval by the Examination Board, students can select a module in a relevant subject from any of the lectures being offered at the Technical University of Munich and Ludwig-Maximilians University as an alternative to the elective modules in the subject catalog.

BGU45038	Atmosphere and Ocean	2V + 2V	3	4	5	Written Exam	90	English
BGU57019	Geokinematics and Continental Hydrology	2V + 2V	3	4	5	Written Exam	120	English
BGU45039	Earth Observation Satellites	2V + 2Ü + 1S	3	5	5	Written Exam	90	English
BGU48035	Photogrammetry	4S	3	4	5	Presentation	30	English
BGU69002	Remote Sensing	2V + 2S	3	4	5	Examination parcours		English
BGU30062	Geoinformation	3VI	3	3	5	Written Exam	60	English
BGU61034	Precise GNSS	2Ü + 3VI	3	5	5	Written Exam	120	English
BGU61031	Advanced Aspects of Navigation Technology	2V + 2S	3	4	5	Written Exam	120	English
BGU61032	Navigation Labs	4Ü	3	4	5	Laboratory assignment		English

Explanations:
Sem.= semester; SWS = weekly hours per semester; V = lecture; VI = lecture with exercise Ü = exercise; S = seminar

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

Credit balance for the respective semester:

Semester	Credits Required Modules	Credits Elective Modules	Credits Master's Thesis	Total Credits	Number of exams
1	30			30	6
2	30			30	6
3	20	10		30	6
4			30	30	1

Total: 120

Appendix 2: Aptitude Assessment

Aptitude assessment for the Master's Degree Program Earth Oriented Space Science and Technology at the Technical University of Munich

1. Purpose of the Process

[1]Eligibility for the Master's Degree in Earth Oriented Space Science and Technology is subject to the following rules in addition to the requirements set out in § 36(1) Subsections 1 and 2, and requires proof of aptitude as set out in § 36(1) Subsection 3. [2]The special qualifications and skills of the candidates should correspond to the field of satellite application engineering. [3]The 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 a natural science or engineering; and

1.3 Ability to work interdisciplinarily and have a good command of the English language.

2. Aptitude Assessment Process

2.1 The aptitude assessment is conducted on an annual basis by the TUM department of Aerospace and Geodesy.

2.2 [1]Applications 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. and specified in § 36(1)2 no later than 31st of May (absolute deadline) using the online application procedure. [2]The degree certificate and diploma must be submitted five weeks after the first day of classes at the latest. [3]Admission to the master's program is, otherwise, not possible in accordance with § 36 of these regulations.

2.3 The application must include all of the following:

2.3.1 Proof of a university degree in accordance with § 36; if verification thereof has not already been submitted by the time the application is submitted, full proof of the coursework and examination requirements in the bachelor's degree (transcript of records) must also be submitted which shows that 140 credits were achieved.

2.3.2 Curriculum vitae formatted as a table.

2.3.3 A written statement in English (max. one to two A4 pages) stating the reasons for choosing the Master's Degree Program Earth Oriented Space Science and Technology at the Technical University of Munich, in which the applicant explains the specific abilities and interests that make him/her particularly qualified for the program; an applicant's exceptional motivation and commitment is to be demonstrated 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, if necessary by appropriate documentation.

2.3.4 An essay of 500 to 700 words written in English on a discipline-specific topic that is relevant for the degree program; the chairperson of the Commission can provide one or several topics to choose from; it must be disclosed to the applicants by 15 December at the latest.

2.3.5 A declaration that the reasons for selecting the degree program and the essay are the applicant's own work and that the applicant has clearly identified any ideas taken from outside sources.

3. Aptitude Assessment Commission

3.1 [1]The aptitude assessment is administered by a special Commission that, as a rule, consists of the chairperson of the Departmental Committee for Student Affairs in charge of the Master's Degree Program Earth Oriented Space Science and Technology, at least two university educators, and at

least one academic staff member. [2]At least half of the Commission members must be university educators within the meaning of Art. 2(3)1 of the Bavarian Law on Academic Staff (BayHSchPG). [3]A student representative should have an advisory role on the Commission.

3.2 [1]The appointment of members is undertaken by the Department Council in consultation with the Dean of Studies. [2]At least one university educator is appointed as a deputy member of the Commission. [3]As a rule, the Commission is chaired by the chairperson of the Departmental Committee for Student Affairs. [4]Procedural regulations will be in accordance with Art. 41 of the Bavarian Higher Education Act (*BayHSchG*) as last amended.

3.3 [1]If the Commission acts in accordance with these regulations, it is permitted to delegate certain duties to individual members on a revocable basis. [2]If, in accordance with Sentence 1, only one member of the Commission is responsible for the performance of certain duties, he or she must be a university educator. [3]If two or more members of the Commission act in the performance of certain duties in accordance with Sentence 1, at least half of them must be university educators. [4]The Commission is to ensure the proper allocation of duties. [5]If there is a scoring margin for one of the evaluation criteria of the aptitude assessment and if at least two members of the Commission are involved in the evaluation of that criterion, the members are to make their evaluations independently according to the indicated weighting, unless otherwise specified; the score is determined from the arithmetic mean of the individual scores, whereby decimals are rounded off to whole numbers.

4. Admission to the Aptitude Assessment Process

4.1 Admission to the aptitude assessment process requires that all documentation specified in Subsection 2.3 has been submitted in a timely and complete fashion.

4.2 Applicants who have fulfilled the requirements will be assessed according to Subsection 5.

4.3 [1]Applicants who are not admitted to the program will receive a letter of rejection with the reasons for the rejection and will be provided information on the legal remedies they are entitled to. [2]Signatory power may be delegated.

5. The Aptitude Assessment Process

5.1 <u>First Stage</u>

5.1.1 [1]The Commission will assess, on the basis of the written application documents required under Subsection 2.3, whether or not an applicant is suitable for the program in accordance with Subsection 1 (first stage of the aptitude assessment process). [2]For this purpose, the Commission evaluates and grades the candidate's application documents on a scale ranging from 0 to 100 points, 0 being the worst and 100 the best possible result.

The following selection criteria are used to calculate the score:

a) [1]The examination requirements indicated in the transcript of records, which must be worth 140 credits, are converted into a grade point average. [2]The calculated grade point average is recalculated into a score between 0 (grade 4.0) and 30 (grade 1.0), whereby grades of international degrees will be converted by applying the Bavarian formula and the score will be rounded to one decimal place. [3]If the grade is 1.5 or better, the following formula will be used to calculate the score.

$$\text{Score} = 50 - 20 * \text{grade}$$

[4]If the average is less than 1.5, the following formula will be used:

$$\text{Score} = 32 - 8 * \text{grade}$$

[5]If 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. [6]The applicant needs to submit a list of the results together with the application and confirm its accuracy. [7]The average is calculated from graded module examinations amounting to 140 credits. [8]The overall grade average is calculated as a weighted grade average. [9]The grade weights of the individual modules correspond to the credits assigned to each module.

b) [1]The curricular analysis is conducted on the basis of competencies in mathematics, physics and computer programming knowledge, rather than a schematic comparison of modules. [2]The analysis is based on the required subject areas for completing a university degree in accordance with § 36, the selected areas of concentration and examination subjects, and the academic work/projects completed while completing a university degree. [3]The applicants will receive a maximum of 20 points, whereby competency in the following areas will be assessed:

1. Fundamentals of mathematics with a maximum of 10 points,
2. Fundamentals of physics with a maximum of 7 points, and
3. Fundamentals of computer programing with a maximum of 3 points

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[4]In their aptitude assessment meeting, the Commission makes a list of the specialized knowledge and/or modules required as binding eligibility requirements, which fall under the above-mentioned specialized knowledge areas. [5]If necessary, the list can be amended by the Commission during the assessment, whereby it must be ensured that the applicant's documents that have already been evaluated are re-evaluated based on the amended list. [6]The score is calculated by dividing the total number of credits from the modules taken for the applicant's bachelor's degree that fall under the three specialized knowledge areas by the quotient 1.5, whereby 20 is the highest possible score.

c) [1]The applicant's written essay detailing the reasons for applying to the degree program Earth Oriented Space Science and Technology will be assessed by two Commission members using a scale of 0 to 32 points. [2]The content of this written statement of purpose will be assessed using the following criteria:

1. A well-structured presentation explaining the connection between the student's personal interests and degree program content,
2. Exceptional motivation, special achievements and extracurricular activities related specifically to the degree program (internship, research/scholarly activities) (cf. Section 2.3.3),
3. Linguistic quality (vocabulary, orthography and grammar).

[3]Committee members independently assess each of the criteria, weighting them as follows:

1. A well-structured presentation explaining the connection between the student's personal interests and degree program content: weighted with factor of 4,
2. Exceptional motivation, special achievements and extracurricular activities related specifically to the degree program (internship, research/scholarly activities): weighted with factor of 1;
3. quality (vocabulary, orthography and grammar): weighted with factor of 3.

[4]The score will be calculated as the arithmetic mean of the individual assessments, rounded up to the nearest full point.

d) [1]The essay will be evaluated by two Commission members and graded on a scale of 0 to 18 points. [2]The content of this essay will be assessed using the following criteria:

1. Discipline-specific relevance of the selected topic for the degree program of Earth Oriented Space Science and Technology;
2. Accuracy of content;
3. Ability to do research work and/or basic research and methodological work; and
4. Competency with English specialized terminology related the natural sciences.

[3]Committee members independently assess each of the four criteria, weighting them as follows:

1. Discipline-specific relevance of the selected topic for the degree program of Earth Oriented Space Science and Technology: weighted with factor of 1;
2. Accuracy of content: weighted with factor of 3;
3. Ability to do research work and/or basic research and methodological work: weighted with factor of 2; and
4. Competency with English specialized terminology related the natural sciences: weighted with factor of 3.

[4]The score will be calculated as the arithmetic mean of the individual assessments, rounded up to the nearest full point.

5.1.2 [1]The total number of points for the first stage of the aptitude assessment is determined by adding the individual number of points achieved in points a) to d). [2]Decimal places are rounded up.

5.1.3 Applicants who have achieved 81 points will receive confirmation that they have passed the aptitude assessment.

5.1.4 [1]Unsuitable applicants with a score less than 60 points will receive a rejection letter signed by the director of the university with the reasons for the rejection as well as information on the legal remedies available. [2]Signatory power may be delegated.

5.2. Second Stage

5.2.1 [1]The remaining applicants will be invited to an aptitude assessment interview. [2]Interview appointments will be announced at least one week in advance. [3]Time slots for interviews must be scheduled before expiration of the application deadline. [4]The interview appointment must be kept by the applicant. [5]If 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-founded request, but no later than two weeks before the beginning of classes.

5.2.2 [1]The aptitude assessment interview is to be held individually for each applicant. [2]The interview lasts at least 20 minutes but not more than 30 minutes for each applicant and will take place in English. It should show whether the applicant can be expected to achieve the goals of the degree program on a scholarly basis while working independently and with a sense of responsibility. [3]The aptitude assessment interview addresses the following main topics:

1. Exceptional motivation and interest in the Master's Degree Program Earth Oriented Space Science and Technology in accordance with the criteria specified in Subsection 2.3.3 for the written statement of purpose (maximum 15 points);
2. The aptitude parameters listed in Subsection 1.1 and 1.2 (basic and application-based issue) (maximum 20 points);
3. Ability to express themselves in English using discipline-specific terminology (maximum 15 points).

[4]The above topics may cover the documentation submitted in accordance with 2.3. [5]Any subject-specific academic knowledge that is to be taught in the Master's Degree Program Earth Oriented Space Science and Technology will not affect the decision. [6]With the applicant's approval, a representative of the student body may sit in on the interview.

5.2.3 [1]The aptitude assessment interview will be conducted by two members of the Commission. [2]Committee members independently assess each of the three focus areas, whereby the focus areas will be weighted as specified in Subsection 5.2.2 Sentence 3. [3]Each member of the Commission will grade the result of the interview on a scale from 0 to 50, 0 being the worst and 50 being the best possible result. [4]The total points will be calculated as the arithmetic mean of the individual evaluations. [5]Non-vanishing decimal places must be rounded up.

5.2.4 [1]The total number of points awarded in the second stage is the sum of the points from 5.2.3 and the points from 5.1.1 a) (overall grade average) and 5.1.1 b).(subject-specific qualification). [2]Applicants with 81 or more points will be deemed suitable.

5.2.5 [1]The applicant will be notified of the results of the aptitude test conducted by the Commission in writing. [2]The official notification is to be signed by the President of the Technical University of Munich. [3]Signatory power may be delegated. [4]A rejection letter is to be sent with reasons for the rejection and information on the legal remedies available.

5.2.6 Admissions to the Master's Degree Program Earth Oriented Space Science and Technology apply to all subsequent applications to this program.

6. Documentation

[1]The aptitude assessment process is to be documented. [2]A record is to be kept about the assessment interview, which must give an overview of what occurred in the meeting (date, place, beginning and end of the interview, the names of the Commission members present, the names of the applicant, as well as any unusual occurrences). [3]The main subjects discussed and outcome of the discussion must also be recorded. These can be listed as bullet points.

7. Repeat Aptitude Assessments

Any applicant who did not pass the aptitude assessment for the Master's Degree Program Earth Oriented Space Science and Technology can reapply for a new aptitude assessment one time.