The officially published GERMAN text alone has binding force!

Academic and Examination Regulations for the
Master's Degree Program in Geodesy and Geoinformation
at the Technical University of Munich

Dated 19 June 2017

Engrossed version
as amended by the Summary Amending Statute of 25 April 2018

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 Bayerisches Hochschulgesetz (BayHSchG) [Bavarian Higher Education Act] the Technical University of Munich issues the following Subject Examination and General Academic Regulations (Fachprüfungs- und Studienordnung, FPSO):

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§ 34
Applicability, Academic Titles

(1) The Academic and Examination Regulations for the Master's Degree Program in Geodesy and Geoinformation (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. The APSO shall have precedence.

(2) Upon successful completion of the Master's examination, the degree “Master of Science” (“M.Sc.”) is awarded. 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 Program in Geodesy and Geoinformation at the Technical University of Munich commences, as a rule, in the winter semester.

(2) The number of classes in required and elective subjects needed to obtain the master's degree is 90 credits (57-62 weekly hours per semester) spread over three semesters. Students will have a maximum of six months to complete their master's thesis pursuant to § 46. The number of coursework units and examinations in required and elective subjects to be completed in the Master's Program in Geodesy and Geoinformation according to Appendix A is a minimum of 120 credits. The standard duration of study for the master's program will be a total of four semesters.

§ 36
Admission requirements, Internship

(1) Eligibility for the Master's Program in Geodesy and Geoinformation is demonstrated by

1. a qualified bachelor’s degree obtained after a program of at least six semesters from a domestic or foreign institution of higher education, or at least an equivalent degree in Geodesy and Geoinformation or a comparable degree program,

2. an adequate knowledge of the English language; students whose native language or language of instruction is not English must demonstrate proficiency through an acknowledged language test such as “Test of English as a Foreign Language” (TOEFL) (with at least 88 points), “International English Language Testing System” (IELTS) (with at least 6.5 points) or “Cambridge Main Suite of English Examinations”; alternatively adequate language skills may be proven through a language qualification at B2 level of the Common European Framework of at least 3 credits. If, in the undergraduate program, 60 credits were obtained for examinations administered in English language examination modules or the final thesis was written in English language (verified by a certificate of the institution of higher education), adequate proficiency in English is deemed proven.

3. passing of the Aptitude Assessment pursuant to Appendix B.

(2) A degree is considered a qualified degree within the meaning of subsection 1 if such degree requires the successful completion of examinations that are equivalent to the examinations in the scholarly oriented bachelor’s program in Geodesy and Geoinformation at the Technical University of Munich specified in subsection 1, No. 1, and correspond to the subject-specific requirements of the master’s program.

(3) For Aptitude Assessment in accordance with subsection 2, required modules of the relevant bachelor's program will be considered. If students do not meet all credit requirements, the
Aptitude Assessment Commission can, in accordance with Appendix 2, No. 3, require students to complete additional fundamentals exams pursuant to subsection 1 to verify their qualification as stipulated in Appendix B, No. 5.1.3. The candidate must be informed thereof after review of the documentation during the first stage of the Aptitude Assessment.

(4) The comparability of programs, the subject-specific aptitude as well as the equivalence of degrees acquired from foreign institutions will be decided upon by the Examination Board in compliance with Art. 63 of the Bayerisches Hochschulgesetz [Bavarian Higher Education Act].

(5) Notwithstanding Paragraph 1 No. 1, students enrolled in a bachelor's program specified in Paragraph 1 No. 1 may be admitted to the master's program in justified cases. An application to the master's program by students enrolled in a bachelor's program may only be submitted if it can be verified that, in the case of a six-semester bachelor's program, module examinations amounting to at least 120 credits, in the case of a seven-semester bachelor's program, module examinations amounting to at least 150 credits, and, in the case of an eight-semester bachelor's program, module examinations amounting to at least 180 credits have been completed at the time of submission of the application. Verification of the awarding of the bachelor's degree must be provided within one year of commencement of the master's program.

§ 37
Modular Structure, Module Examination, Courses, Fields of Study, Language of Instruction

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

(2) The curriculum listing the degree requirements modules is included in Appendix A. The curriculum, including electives, is to be agreed upon between the individual student and his or her mentor in the area of specialization. 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 by the end of the second semester of enrollment in the degree program, in which they acquire integrative knowledge of German. Each member of the TUM Department of Civil, Geo and Environmental Engineering who is authorized to administer examinations at TUM pursuant to the Hochschulprüferverordnung [act governing examiners at institutions of higher education] may be assigned as mentor.

(3) At the end of the first semester, students choose one of three specializations

1. Earth measurement and satellite geodesy
2. Photogrammetry, remote sensing and cartography
3. Geodesy, Geoinformatics and Land Management

in the amount of 36 credits, as well as an elective module in the amount of 6 credits from the required module lists of the areas of specialization not chosen.

In exceptional cases, students may submit a proposal for a different area of specialization (also in the amount of 36 credits) designed from modules listed in the module catalogs of areas 1, 2 and 3 above. The proposal must include a statement of motivation for choosing the desired specialization, a list of suggestions for the modules to be completed and a recommendation from the Dean of Studies. The Dean of Studies may propose a name for the desired area of specialization. The Examination Board shall decide on the proposals in consultation with the Dean of Studies, where applicable, subject to stipulations.

(4) In addition, elective modules amounting to at least 12 credits must be completed from the entire subject catalog of the elective modules.
As a rule, the language of instruction in the Master's Degree Program in Geodesy and Geoinformation is English. Modules that are entirely or partly taught in German are identified in Appendix A. Where the language of instruction for a module is specified as either English or German, the examiner will authoritatively determine the actual language of instruction in a suitable manner prior to commencement of classes.

§ 37a
Internship

(1) An internship is required as coursework as defined in § 6 (7) of the APSO. The duration will be 5 weeks (6 credits). It must be completed by the end of the sixth semester. This shall be carried out at an institution dealing with geodesy, satellite geodesy, earth measurement, photogrammetry, remote sensing, cartography, geoinformation or land development or at a private engineering office or company with its own surveying department and may be carried out in stages and at different locations, whereby no stage may last less than two weeks. Successful completion will be confirmed by the companies or government agencies where the internship was completed and certified by internship reports. Proof of successful completion of the internship and its approval by the examination board are a prerequisite for being awarded the master's degree certificate.

(2) The internship is to be chosen in consultation with an appointed examiner, who will serve as the internship supervisor. Appointed examiners are those from the TUM Department of Civil, Geo and Environmental Engineering who are authorized to administer examinations at TUM. Expert examiners as stipulated in sentence 2 are appointed by the Examination Board.

(3) The Examination Board decides on the recognition of vocational training or comparable achievement, according to subsection 1, as internship.

§ 38
Examination Deadlines, Progress Monitoring, Failure to Meet Deadlines

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

§ 39
Examination Board

Pursuant to § 29 of the APSO, the board responsible for all decisions concerning examination matters shall be the Examination Board of the TUM Department of Civil, Geo and Environmental Engineering.

§ 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 (Klausuren) and oral examinations, types of assessment pursuant to § 12 and § 13 of the APSO may include (but are not limited to) exercises (tests, where applicable), reports, project work, presentations, learning portfolios and/or research papers.

a) 1 A **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. 2 The duration of Klausuren is provided for in § 12 (7) of the APSO.

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

c) 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.

d) 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 The specific components of each project work assignment and the related competencies to be assessed are delineated in the module description. 4 Project work may include group work. 5 Students are expected to demonstrate that they are able to complete the tasks in a team environment. 6 A student’s contribution to group work which is to be assessed as a component of an examination must be clearly identifiable and gradable. 7 This also applies to each individual’s contribution to the group result.

e) 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 [Thesenpapier], abstract, term paper, seminar paper, etc. 4 The 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 Specific details on each research paper and the related competencies to be assessed are set out in the module description.

f) 1 A **presentation** is a systematic and structured oral performance supported by suitable audio-visual equipment (such as beamer, 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. 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 and relating to his or her subject area. The presentation may be complemented by a brief written precis. A student’s contribution to group work which is to be assessed as a component of an examination must be clearly identifiable and gradable. This also applies to each individual’s contribution to the group result.

An oral examination is a timed, graded discussion on relevant topics and specific questions to be answered. In 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. The oral examination will be held either as an individual or group examination. The duration of the examination is provided for in § 13 (2) of the APSO.

A 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. Students 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. With 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. Depending on the module description, 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. The specific components of each learning portfolio and the related competencies to be assessed are set out in the module description.

The module examinations will, as a rule, be taken concurrently with the program. The type and duration of module examinations is stipulated in Appendix A. The selection of modules must comply with § 12 (8) of the APSO. The assessment of the module examination is governed by § 17 of the APSO. The grade weights of module examination components correspond to the weighting factors assigned to them in Appendix A.

Where Appendix A provides that a module examination is either in written or oral form, the examiner will inform the students in appropriate form, at the commencement of classes at the latest, of the type of examination to be held.

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

§ 42

Registration for and Admission to the Master’s Examination

Students who are enrolled in the Master’s Degree Program in Geodesy and Geoinformation are deemed admitted to the module examinations of the master’s examination. Also considered admitted to individual module examinations are those students who take additional examinations within the scope of the consecutive bachelor’s program Geodesy and Geoinformation at the Technical University of Munich, according to § 49a of the Academic and Examination Regulations for the Bachelor’s Degree Program in Geodesy and Geoinformation of the Technical University of Munich dated 23 November 2012 in the currently valid version.

Registration requirements for required and elective module examinations are stipulated in § 15 (1) of the APSO. The registration requirements for repeat 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. the module examinations in the corresponding modules pursuant to subsection (2),
2. the master’s thesis pursuant to § 46
3. and the coursework listed in § 45.

(2) The module examinations of required modules are listed in Appendix A. Students must successfully complete 66 credits of required modules and at least 18 credits of elective modules. The selection of modules must comply with § 8 (2) of the APSO.

§ 44  
Repeat Examinations, Failed Examinations

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

§ 45  
Coursework

In addition to the examinations listed in § 43 (1) Nos. 1 and 2, the successful completion of an internship in accordance with § 37a is to be completed as coursework in the amount of 6 credits.

§ 45 a  
Multiple Choice Test

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

§ 46  
Master’s Thesis

(1) As part of the master’s examination, each student must write a master’s thesis pursuant to § 18 of the APSO. The master’s thesis topic may be determined and assessed by expert examiners of the TUM Department of Civil, Geo and Environmental Engineering. Expert examiners as stipulated in sentence 2 are appointed by the Examination Board.

(2) Students who have earned a minimum of 70 credits are admitted to commence work on the master’s thesis. Students must commence work on their master’s thesis no later than 12 months after “Admission to Commence Master’s Thesis”. If the admission requirements stated in sentence 1 have been complied with, the student will be admitted to commence the master’s thesis by the examination board (letter of admission). Upon presentation of the letter of admission, the master's thesis topic will be determined and the thesis will be supervised by an expert examiner as set out in (1) (Themenssteller).

(3) The period of time between topic assignment and submission of the completed master’s thesis must not exceed six months. 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. The master’s thesis may be written in either the German or the English language.
The completion of the master’s thesis consists of a written composition and a presentation on its content. The presentation does not affect the grading. If the master’s thesis was not graded with at least “sufficient” (4.0), it may be repeated once with a new topic. Students must renew their application for admission within six weeks from receipt of the grade.

§ 47
Passing and Assessment of the Master’s Examination

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

The grade for a module will be calculated according to § 17 of the APSO. 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. The grade weights of the individual modules correspond to the credits assigned to each module. The overall assessment is expressed by the designation pursuant to § 17 of the APSO.

§ 48
Degree Certificate, Diploma, Diploma Supplement

If the master’s examination was 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. The date to be entered on the degree certificate is the day when all examination and course work requirements have been fulfilled.

§ 49
Entry into Force

This statute shall enter into force on 11 May 2017. They shall apply to all students who commence their studies at the Technical University of Munich as of the winter semester 2017/18. At the same time, the regulations for the Master’s Program in Geodesy and Geoinformation at the Technical University of Munich from 10 August 2011 shall cease to apply. Students who commenced their studies at the Technical University prior to the winter semester 2017/18 are to complete their studies in accordance with the regulations pursuant to sentence 1.

*) This provision concerns the entry into force of the original version of these regulations dated 19 June 2017. The date on which the amendments enter into force is set out in the Amending Statutes.
### Appendix A: Examination Modules

<table>
<thead>
<tr>
<th>Module No.*</th>
<th>Module name</th>
<th>Type of instruction/SWS</th>
<th>Semester</th>
<th>SWS</th>
<th>Credits</th>
<th>Type of examination</th>
<th>Duration of examination</th>
<th>Language(s) of instruction</th>
</tr>
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<tbody>
<tr>
<td>BV 610010</td>
<td>Geodetic Seminar</td>
<td>S</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>Presentation</td>
<td>---</td>
<td>English/ German*</td>
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<tr>
<td>BV 530008</td>
<td>Geodetic Engineering and Consulting</td>
<td>V</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>Written or oral exam</td>
<td>120 min or 40 min</td>
<td>English</td>
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<tr>
<td>BV 610009</td>
<td>Global Geodetic Observing System and GNSS</td>
<td>4V + 1Ü</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>Written exam</td>
<td>120 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 300022</td>
<td>Spatial Databases and Visualization</td>
<td>4V + 2Ü</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>Written exam</td>
<td>120 min</td>
<td>English</td>
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<tr>
<td>BV 480012</td>
<td>Principles of Image Understanding and Signal Processing</td>
<td>6V + 3Ü</td>
<td>1</td>
<td>9</td>
<td>9</td>
<td>Written exam (70 %) exercises (30 %)</td>
<td>120 min</td>
<td>English</td>
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### Required modules in 1st Semester

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<tr>
<th>Module No.*</th>
<th>Module name</th>
<th>Type of instruction/SWS</th>
<th>Semester</th>
<th>SWS</th>
<th>Credits</th>
<th>Type of examination</th>
<th>Duration of examination</th>
<th>Language(s) of instruction</th>
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<tbody>
<tr>
<td>BV 610011</td>
<td>Space Geodetic Techniques</td>
<td>5V + 1Ü</td>
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<td>6</td>
<td>6</td>
<td>Oral Exam</td>
<td>30 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 450011</td>
<td>Data Analysis and Numerical Methods in Satellite Geodesy</td>
<td>4V + 2Ü</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>Oral Exam</td>
<td>30 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 610012</td>
<td>Positioning and Navigation</td>
<td>1V + 4S</td>
<td>2</td>
<td>5</td>
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<td>Research Paper</td>
<td>---</td>
<td>English</td>
</tr>
<tr>
<td>BV 450012</td>
<td>Gravity Field</td>
<td>3V + 3S</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>Oral exam (50%) and project work (50%)</td>
<td>30 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 570005</td>
<td>Earth System</td>
<td>V</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>Oral Exam</td>
<td>30 min</td>
<td>English</td>
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<tr>
<td>BV 570006</td>
<td>Seminar: Earth System</td>
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<td>3</td>
<td>6</td>
<td>6</td>
<td>Project work</td>
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### Required module for Specialization 1: Earth measurement and satellite geodesy

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<tr>
<th>Module No.*</th>
<th>Module name</th>
<th>Type of instruction/SWS</th>
<th>Semester</th>
<th>SWS</th>
<th>Credits</th>
<th>Type of examination</th>
<th>Duration of examination</th>
<th>Language(s) of instruction</th>
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<tbody>
<tr>
<td>BV 610011</td>
<td>Space Geodetic Techniques</td>
<td>5V + 1Ü</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>Oral Exam</td>
<td>30 min</td>
<td>English</td>
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<tr>
<td>BV 450011</td>
<td>Data Analysis and Numerical Methods in Satellite Geodesy</td>
<td>4V + 2Ü</td>
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<td>6</td>
<td>Oral Exam</td>
<td>30 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 610012</td>
<td>Positioning and Navigation</td>
<td>1V + 4S</td>
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<td>5</td>
<td>6</td>
<td>Research Paper</td>
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<td>English</td>
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<tr>
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<td>6</td>
<td>Oral exam (50%) and project work (50%)</td>
<td>30 min</td>
<td>English</td>
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<td>BV 570005</td>
<td>Earth System</td>
<td>V</td>
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<td>Oral Exam</td>
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<tr>
<td>BV 570006</td>
<td>Seminar: Earth System</td>
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<td>Project work</td>
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<td>English</td>
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<td>Module No.**</td>
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<td>Type of instruction/SWS</td>
<td>Semester</td>
<td>SWS x</td>
<td>Credits</td>
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<td>Duration of examination</td>
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<td>BV 480013</td>
<td>Selected Chapters of Photogrammetry and Remote Sensing</td>
<td>3V + 3S</td>
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<td>6</td>
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<td>60 min and 30 min</td>
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<td>120 min</td>
<td>English</td>
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<td>BV 300023</td>
<td>Multiscale Geodata Handling and Mining</td>
<td>3V + 3Ü</td>
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<td>English</td>
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<td>BV 310002</td>
<td>Signal Processing and Industrial Photogrammetry</td>
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<td>Written exam</td>
<td>120 min</td>
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<td>BV 480015</td>
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<td>3</td>
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<td>English</td>
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<td>BV 300024</td>
<td>Seminar Cartography</td>
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<td>3</td>
<td>6</td>
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<td>Report</td>
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<td>English</td>
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**Required module for Specialization 2: Photogrammetry, Remote Sensing and Cartography**

**Required module for Specialization 3: Geodesy, Geoinformatics and Land Management**

<table>
<thead>
<tr>
<th>Module No.**</th>
<th>Module name</th>
<th>Type of instruction/SWS</th>
<th>Semester</th>
<th>SWS x</th>
<th>Credits</th>
<th>Type of examination</th>
<th>Duration of examination</th>
<th>Language(s) of instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>BV 530009</td>
<td>Applied Geodesy</td>
<td>3V + 2Ü</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>Written or oral exam (50%) and exercises (50%)</td>
<td>120 min or 40 min</td>
<td>English</td>
</tr>
<tr>
<td>BV 470013</td>
<td>Advanced GIS I</td>
<td>4V + 2Ü</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>Written exam</td>
<td>120 min</td>
<td>English</td>
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<tr>
<td>BV 400006</td>
<td>Kommunal- und Landentwicklung</td>
<td>S</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>Project work</td>
<td>---</td>
<td>German</td>
</tr>
<tr>
<td>BV 530010</td>
<td>Spezielle Aufgaben in der Ingenieurgeodäsie</td>
<td>1V + 1Ü + 3P</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>Written or oral exam (50%) and project report (50%)</td>
<td>60 min or 20 min</td>
<td>German</td>
</tr>
<tr>
<td>BV 470014</td>
<td>Advanced GIS II</td>
<td>3Ü + 3S</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>project work</td>
<td>---</td>
<td>English</td>
</tr>
<tr>
<td>N.N.</td>
<td>Angewandtes Landmanagement</td>
<td>3V + 2Ü</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>Exercises</td>
<td>---</td>
<td>German</td>
</tr>
<tr>
<td>Module No.**</td>
<td>Module name</td>
<td>Type of instruction/SWS</td>
<td>Semester</td>
<td>SWS(x)</td>
<td>Credits</td>
<td>Type of examination</td>
<td>Duration of examination</td>
<td>Language(s) of instruction</td>
</tr>
<tr>
<td>-------------</td>
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<td>--------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td></td>
<td>Master's Thesis</td>
<td></td>
<td>4</td>
<td>30</td>
<td>Research Paper</td>
<td></td>
<td>English/German</td>
<td></td>
</tr>
</tbody>
</table>

**Required module Master's Thesis**

Explanation:
SWS = Semesterwochenstunden/weekly hours per semester; V = Vorlesung/lecture; Ü = Übung/exercise; P = Projekt/project; S = Seminar

* In the required module, students acquire German language skills as they progress through their studies in accordance with § 37 (2) Sentence 3.

** Module numbers are subject to change; current module numbers can be found in TUMonline.

\(x\) The distribution of SWS among the modules can vary by 1 SWS according to the requirements of the current semester; the current distribution of SWS is indicated in the module description.

**Electives:**
- An elective module in the amount of 6 credits from the required module lists of the areas of specialization not chosen must be completed. In addition, elective modules amounting to at least 12 credits must be completed from the entire subject catalog of the elective modules.
- The Geodesy and Geoinformation Examination Board continuously updates the catalog of elective modules and publishes it, together with the examination details, on the webpage of the master's degree program in Geodesy and Geoinformation no later than the beginning of each semester.
- With each revision and publication of the electives catalog, it will be indicated whether the language of instruction is German or English.
- Credits may also be earned in modules offered by other TUM Schools or Departments or other universities, provided they meet the requirements of the Master's degree program in Geodesy and Geoinformation. Decisions about credit recognition are made by the Geodesy and Geoinformation Examination Board in consultation with the academic advisor for the Master's program in Geodesy and Geoinformation.

**Internship:**
- An internship in accordance with § 37a is to be completed as coursework in the amount of 6 credits.
### Credit total for each semester

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits Required modules</th>
<th>Credits Required elective modules</th>
<th>Credits elective modules</th>
<th>Credits Master's Thesis</th>
<th>Total Credits</th>
<th>Number of exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30</td>
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<tr>
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<td>-</td>
<td>18</td>
<td>6</td>
<td>-</td>
<td>30*)</td>
<td>5-6</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>30</td>
<td>1</td>
</tr>
</tbody>
</table>

*) The internship (6 credits) may be completed in any given semester. The internship credits are listed in the third semester only as an example.
Appendix B: Aptitude Assessment

Academic and Examination Regulations
for the Master’s Program in Geodesy and Geoinformation
at the Technical University of Munich

1. Purpose of the Assessment

1 Eligibility for the Master’s Degree Program in Geodesy and Geoinformation, in addition to the requirements pursuant to § 36 (1) No(s). 1 and 2, requires proof of aptitude pursuant to § 36 (1) No. 3 in accordance with the following provisions. 2 The special qualifications and skills of the candidates should correspond to the field of Geodesy. 3 Individual aptitude parameters are:

1.1 ability to do research work and/or basic research and methodological work;
1.2 specialist knowledge in the field of Geodesy from a bachelor’s degree program comparable to the bachelor's program in Geodesy and Geoinformation at the Technical University of Munich,
1.3 a sound knowledge of the fundamental sciences of geodesy, i.e. fundamental knowledge of mathematics, informatics, statistics and physics,
1.4 an affinity for engineering and interest in geodetic questions, as well as the ability to think in spatial terms,
1.5 ability to work interdisciplinarily and good command of the English language.

2. Aptitude Assessment Process

2.1 The aptitude test will be held annually (semi-annually for applicants in higher semesters) by the TUM Department of Civil, Geo and Environmental Engineering.
2.2 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 2.3.4. and in § 36 (1) No. 2 no later than 31 May (absolute deadline) using the online application procedure.
2.3 The application must include:

2.3.1 Transcript of Records with modules of at least 120 credits for a six-semester bachelor's program, at least 150 credits for a seven-semester bachelor's program, and at least 180 credits for an eight-semester bachelor's program; the Transcript of Records must be issued by the relevant examination authority or the relevant academic programs office,
2.3.2 curriculum vitae formatted as a table,
2.3.3 an English-language written statement (max. 1-2 A4 pages) of the reasons for choosing the master’s degree program in Geodesy and Geoinformation at the Technical University of Munich in which the candidate explains those specific abilities and interests that make him/her particularly qualified for the program; a candidate’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 a declaration that the statement of the reasons for choosing the program is the candidate’s own work, and that the candidate has clearly identified any ideas taken from outside sources;

3. Aptitude Assessment Commission

3.1 Aptitude assessment is administered by a commission that, as a rule, consists of the dean of studies in charge of the master’s degree program in Geodesy and Geoinformation, at least two members of the professorial faculty and at least one research associate (wissenschaftlicher Mitarbeiter). At least half of the commission members must be members of the professorial faculty. A representative of the student body will be a part of the commission, in an advisory capacity.
3.2 The members of the Commission are appointed by the faculty council (Fakultätsrat) in consultation with the dean of studies. At least one member of the professorial faculty is
appointed as deputy member of the commission. As a rule, the commission is chaired by the dean of studies. Procedural regulations will be in accordance with Art. 41 of the BayHSchG as last amended.

3.3 If the Commission acts in accordance with these regulations, the revocable delegation of certain duties to individual members of the Commission is permissible. If, pursuant to the sentence 1, only one member of the Commission acts in the performance of certain duties, he or she must be a member of the professorial staff. If, pursuant to the sentence 1, two or more members of the Commission act in the performance of certain duties, at least half of them must be members of the professorial staff. The Commission is to ensure the proper allocation of duties. If there is a scoring margin for one of the evaluation criteria of the aptitude assessment and if at least two Commissioners are involved in the evaluation of that criterion, the Commissioners shall make their evaluations independently according to the indicated weighting, unless otherwise specified; the number of points to be awarded shall be the arithmetic mean of the individual evaluations, rounded up to the nearest whole number.

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 Applicants who have fulfilled the requirements will be assessed according to No. 5.

4.3 Applicants who are not admitted will receive a notification specifying the reasons and providing information on legal remedies.

5. The Aptitude Assessment Process

5.1 First stage of the aptitude assessment process

5.1.1 The commission will assess, 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). 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 criteria will be applied to the evaluation:

a) Discipline-Specific Skills and Qualifications

For the purpose of curricular analysis, a schematic comparison of modules, as well as of competencies is conducted. The analysis is based on the fundamental subject groups listed in the following table of the bachelor’s program in Geodesy and Geoinformation at the Technical University of Munich.

<table>
<thead>
<tr>
<th>Academic subject area</th>
<th>Credits TUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Fundamentals (Mathematics and Geometry, Physics, Informatics)</td>
<td>35</td>
</tr>
<tr>
<td>Discipline-specific Subjects (Sensors and Methods, Geoinformatics, Land Management, Image Processing, Photogrammetry and Remote Sensing, Cartography, Satellite Geodesy, Physical Geodesy)</td>
<td>45</td>
</tr>
</tbody>
</table>

If it is established that there are no significant differences in the competencies acquired (learning outcomes), a maximum of 60 points will be awarded. If this value is not a whole number, it will be rounded up. For any competencies missing from the student’s undergraduate curriculum, points equivalent to the amount of module credits for the respective competencies in the TUM bachelor’s program in Geodesy and Geoinformation will be deducted from the overall score.
b) **Overall Grade**

1. The applicant will be awarded 1.5 points for each tenth that the average calculated from examinations in the amount of 120 credits is better than 3.0.  
2. The maximum number of points is 30.  
3. Negative points will not be awarded.  
4. Grades of international degrees will be converted by the Bavarian formula.  
5. If the candidate has submitted a degree certificate containing more than 120 credits with the application, the assessment will be made on the basis of the best graded modules in the amount of 120 credits.  
6. The applicant needs to submit a list of the results together with the application and confirm their accuracy in writing.  
7. The average is calculated from graded module examinations in the amount of 120 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.  
10. In 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**

1. The applicant's written statement will be evaluated by two Commission members and graded on a scale of 0 – 10 points.  
2. The content of the written statement of purpose will be assessed using the following criteria:
   1. Description of existing expertise and specific aptitude in the field of geodesy,  
   2. a well-structured presentation of the connection between personal interests and degree program content,  
   3. a candidate's exceptional motivation and commitment is to be demonstrated by providing details on program-related, extracurricular activities and subject-specific supplementary skills (see 2.3.3),  
   4. presentation, linguistic expression, logical structure, clarity of statement.  
3. Commission members shall independently assess each of the four criteria, with the first three criteria weighted three times and the fourth criterion weighted once.  
4. The points total will be calculated as the arithmetic means of the individual assessments, rounded up to the nearest full point.

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

5.1.3  
1. Applicants who have achieved 70 points will receive confirmation that they have passed the aptitude assessment.  
2. In those cases where it is determined that only some subject-specific requirements for the master’s program are missing from undergraduate studies, the aptitude assessment commission may require that applicants complete fundamentals exams from the bachelor’s program in Geodesy and Geoinformation amounting to a maximum of 30 credits.  
3. These fundamentals exams must be successfully completed in the first year of study.  
4. Failed fundamentals exams may be repeated only once within this period of time and at the next examination date.  
5. The Examination Board may make the admission to individual module examinations dependent on the successful completion of the fundamentals exam.

5.1.4  
1. Applicants not suited for the program, with a total of 50 points or fewer, will receive a letter of rejection signed by the president of the university stating the grounds for rejection and informing them of legal remedies.  
2. Signatory power may be delegated.  
3. Upon request, applicants who are entitled to compensation for disadvantages due to disability, chronic or long-term illness will receive an invitation to the second stage of aptitude assessment, in departure from No. 5.1.1 through 5.1.3, instead of a direct rejection, if their overall grade is high enough to have been granted direct admission or admission to the second stage of assessment.  
4. The request must be accompanied by relevant supporting documents.
5.2 Second Stage of the aptitude assessment process:

5.2.1 1The remaining applicants will be invited for 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. 6If 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 will be held in English and last at least 20 but not more than 30 minutes for each applicant.

3The interview will focus on the following topics:

1. The applicant’s clear understanding of the range of topics and the requirements of the master’s program, as well as the extent to which the program’s content corresponds to his or her own objectives in studying.
2. Questions regarding the aptitude parameters pursuant to No. 1.3
3. The applicant’s competence in the analysis of geodetic questions and contextual relationships based on his or her approach to solving an exemplary problem.
4. Personal impression (after the interview): Applicants will be evaluated, for example, on their ability to convincingly demonstrate information using arguments and meaningful examples and appropriately respond to interview questions.

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 Geodesy and Geoinformation 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 at least two members of the Commission. 2Commission members shall independently assess each of the four points, for each of which the following maximum points may be awarded:

   1. 20
   2. 20
   3. 30
   4. 20

3Each member will grade each of the five interview topics on a scale from 0 to 90, 0 being the worst and 90 being the best possible result. 4The points total will be calculated as the arithmetic mean of the individual evaluations. 5Decimal places must be rounded up.

5.2.4 1The total number of points awarded in stage 2 is the sum of the points from No. 5.2.3 and the points from No. 5.1.1 a) (subject-specific qualification) and 5.1.1 b) (overall grade). 2Applicants with 110 or more points will be deemed suitable.

5.2.5 1The applicant will be notified of the result of the aptitude assessment (where appropriate, in compliance with the requirements set out in 5.1.3 sentence 2) in writing. 2The notice must be signed by the TUM Board of Management. 3Signatory power may be delegated. 4A rejection notice must specify the reasons for the rejection and provide information on legal remedies.

5.2.6 Admissions to the Master’s Program in Geodesy and Geoinformation shall apply to all subsequent applications for this program.
6. **Record**

The aptitude assessment process must be documented, including the date, duration and location of the assessment, the names of the commission members, the applicant’s name, and the decision of the members of the commission as well as the complete results. This record must contain the essential reasons for the decision and the topics discussed at the interview held with the applicants; these reasons and topics may be recorded in note form.

7. **Repetition**

Applicants who have failed aptitude assessment for the Master's Degree Program in Geodesy and Geoinformation may register for one repetition of aptitude assessment.