Only the officially published German version is binding

Examination and Academic Regulations for the Master's Program in Information Systems (Wirtschaftsinformatik) at the Technischen Universität München

September 28, 2018
in the version of the 3rd amendment from September 07, 2021

The English version is provided merely as a convenience and is not a legally binding document.

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 Technische Universität München issues the following Examination and Academic Regulations (*Fachprüfungs- und Studienordnung, FPSO*):

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§ 34
Applicability, Academic Titles

(1) [1]These Examination and Academic Regulations (FPSO) for the Master's program in Information Systems (Wirtschaftsinformatik) complement the General Academic and Examination Regulations for Bachelor's and Master's programs at the Technische Universität München (APSO) from March 18, 2011 as amended. [2]The APSO shall have 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) Commencement of the Master's program in Information Systems (Wirtschaftsinformatik) at the Technische Universität München is possible in the winter or summer semester.

(2) [1]The number of classes in required and elective subjects needed to obtain the Master's degree is 90 credits (63 weekly hours per semester) spread over three semesters. [2]Furthermore, a maximum of six months (30 credits) is added for the completion of the Master's thesis pursuant to § 46. [3]The number of examinations in required and elective subjects to be completed in the Information Systems (Wirtschaftsinformatik) Master's program according to Appendix 1 is hence a minimum of 120 credits (including the Master's thesis). [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 program in Information Systems (Wirtschaftsinformatik) is demonstrated by:

1. a qualified Bachelor's degree of at least six semesters or an equivalent degree in Information Systems (Wirtschaftsinformatik), Informatics with minor in Management Studies, Management Studies with minor in Informatics, or comparable programs obtained from a domestic or foreign university,

2. an adequate knowledge of the English language; students whose language of instruction is not English must demonstrate proficiency through an acknowledged language test such as "Test of English as a Foreign Language" (TOEFL) (at least 88 points), "International English Language Testing System" (IELTS) (at least 6.5 points), or "Cambridge Main Suite of English Examinations"; a Bachelor's thesis written in English can also be accepted as proof of adequate knowledge of the English language

3. applicants who obtained their first degree in one of the following countries must demonstrate specialized knowledge through a "Graduate Record Examination (GRE) General Test" or a "Graduate Aptitude Test in Engineering" (GATE): China, Bangladesh, India, Iran, Pakistan; for applicants with a first degree from a country that is not a signatory state of the Convention on the Recognition of Qualifications concerning Higher Education in the European Region from 11 April 1997 (henceforth referred to as Lisbon Convention) a submission of the test pursuant to sentence 1 is recommended as it will be requested in case of substantial differences in regard to the competencies proven by the first degree pursuant to subsection 2; the request will not be necessary in case of degrees from the signatory states of the Lisbon Convention; details concerning the completion of the test will be announced in time on the webpages of the examination board.

4.   passing of the Aptitude Assessment pursuant to Appendix 2.

(2)   A degree is considered a qualified degree within the meaning of subsection 1 if there are no essential differences with regard to the acquired competencies (learning outcomes) obtained through the Bachelor's program Wirtschaftsinformatik at Technische Universität München specified in subsection 1, no.1, and if these acquired competencies correspond to the subject-specific requirements of the Master's program.

(3)   [1]The assessment according to subsection 2 will be performed on the basis of the required modules of the Bachelor's program in Wirtschaftsinformatik. [2]If certain examination results are missing for the assessment, the Aptitude Assessment Committee pursuant to Appendix 2 may require that the candidates demonstrate eligibility pursuant to subsection 1 by taking those examinations as additional Fundamentals Exams pursuant to Appendix 2 no. 5.1.3. [3]The candidate must be informed thereof after review of the documentation during the first stage of the Aptitude Test.

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

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

(2)   The curriculum listing the required and elective courses is included in Appendix 1.

(3)   [1]The language of instruction of the Master's program Information Systems (Wirtschaftsinformatik) is generally English. [2]In case specific modules are taught completely or partially in German, this is indicated in Appendix 1. [3]If the appendix states that a module will be held in English or German, the examiner shall announce the language of instruction in an appropriate manner no later than the start of the lecture. [4]Students who did not provide a proof of proficiency in German for the application, are admitted on condition to complete at least one module providing integrative knowledge of the German language within the first two semesters of their studies. [5]The course offer will be published by the examination board according to local practice. [6]Voluntarily completed extra-curricular modules by the TUM Language Center will be recognized.

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

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

(2)   [1]At least one of the module examinations listed in Appendix 1 must be successfully completed by the end of the second semester. [2]In the event of failure to meet deadlines § 10 (5) of the APSO shall apply.

§ 39
Examination Board

Pursuant to § 29 of the APSO the board responsible for all decisions concerning examination matters shall be the Examination Board of the Faculty of Informatics of the Technische Universität München.

§ 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, Forms of Examination

(1)   Pursuant to §§ 12 and 13 of the APSO valid types of examination in this program of studies are, besides written and oral exams, in particular laboratory exercises, practical exercises ("Testate", if applicable), reports, project works, presentations, learning portfolios, scientific elaborations and exam courses. [2]The specific components of the respective module examination and the competences to be examined are listed in the module description. [3]The examination can be conducted as an individual or group examination if the topic is suitable; § 18 (2) sentences 2 and 3 APSO apply accordingly.

a) [1]A **written exam** is a supervised written test that shall prove the ability to recognize and understand problems and to find ways of their solution in a limited amount of time using specified methods and predefined auxiliaries. [2]The duration of written exams is governed by § 12 (7) of the APSO.

b) [1]**Laboratory exercises** are, depending on the respective discipline, experiments, measurements, fieldwork, field exercises etc. with the objective of implementation, analysis and gain of knowledge. [2]Elements are for example: description of the processes and the respective theoretical foundations including study of scientific literature, preparation and implementation of experiments, if applicable necessary calculations, their documentation, evaluation and interpretation of results in regard to acquirable knowledge. [3]Additionally a presentation may be part of the project in order to examine the communicative competence of presenting scientific topics to an audience.

c) [1]An **exercise ("Testate", if applicable)** is the practical processing of given assignments (e.g. mathematical problems, programming exercises, modeling exercises etc.) with the objective of applying theoretical contents to solve application-oriented problems. [2]It serves to prove knowledge of facts and details as well as knowledge of their application. [3]The practical exercise may be conducted in written, oral or electronic form. [4]Possible forms of examination are homework, exercise sheets, programming exercises, (electronic) tests, exercises as part of practical courses etc.

d) [1]A **report** is a written elaboration and summary of a study process with the objective of describing the acquired knowledge in a structured way and analyzing the results in the context of a module. [2]The report shall prove the ability to understand and reproduce the main aspects in a written form. [3]Possible forms of reports are for example field trip reports, practical course reports, labor reports etc. [4]Additionally a presentation may be part of the project in order to examine the communicative competence of presenting scientific topics to an audience.

e) [1]In the course of a **project work**, a project assignment shall be completed as a defined objective within a predefined period of time and using suitable auxiliaries in several phases (initiation, problem definition, distribution of roles, idea generation, development of success criteria, decision-making, implementation, presentation, written evaluation). [2]In addition, a

presentation or a technical discussion can be part of the project work in order to test the communicative competence in presenting scientific topics in front of an audience. [3]A project work may also include design drafts, drawings, plan representations, models, objects, simulations and documentation.

f) [1]A **research paper** is a written examination where a student autonomously works on a challenging scientific or respectively scientific-application-oriented problem with scientific methods of the particular discipline. [2]It is intended to prove that such problem in line with the intended study results of the respective module can be tackled on a scientific basis and according to the principles of academic work – from analysis to conception to realization. [3]Possible forms, differing in their aspiration level, are position paper, abstract, essay, study work, seminar paper etc. [4]A scientific elaboration may be supported by a presentation and a colloquium to check the communicative competence regarding presenting scientific topics to an audience.

g) [1]A **presentation** is a systematic, structured oral performance visually supported by suitable media (e.g. beamer, slides, posters, videos) which illustrates and summarizes specific topics or results and reduces complex issues to the essential. [2]The presentation shall prove the capacity of working out a certain topic within a predefined time so that it may be presented in a clear and comprehensive way to an audience. [3]Also it shall be proven that questions, suggestions and points of discussion by the audience in reference to the particular topic are handled competently. [4]The presentation may be supported by a short written workup.

h) [1]An **oral exam** is a time-limited examination dialogue about certain topics and concrete questions to be answered. [2]By oral examination it shall be proven that the qualification objectives listed in the module descriptions are achieved, that connections between the examination subjects were recognized and that particular problems can be classified with respect to these coherences. [3]The duration of oral exams is governed by § 13 (2) of the APSO.

i) [1]A **learning portfolio** is a written exposition of the student's own works selected by predefined criteria with the object of proving the learning progress and the performance level at a specific time and regarding to a defined content. [2]The choice of the specific works as well as their connection to the learning progress and their informative content for achieving the qualification have to be explained. [3]By a learning portfolio it shall be proven that the learning progress is handled responsibly and that the qualification objectives listed in the module descriptions are achieved. [4]Depending on the module description, possible components of successful self-monitoring of the learning portfolio are especially application-oriented papers, websites, web blogs, bibliographies, analyses, discussion papers and graphic preparations of specific issues. [5]On the basis of the learning portfolio, a summary discussion can take place for verbal reflection.

j) [1]Within the **Exam Course**, several elements have to be completed within one examination. [2]Contrary to a partial module examination, the examination will be conducted in an organisationally (spatially resp. temporally) connected manner. [3]Examination elements are a number of different forms of examinations that in their entirety capture the overall competency profile of the module . [4]In particular, examination elements may also be examination forms according to letters g) and h) in combination with a practical performance. [5]The total duration of the examination shall be specified in the module catalog.

(2) [1]The module examinations will, as a rule, be taken concurrently with the program. [2]Type and duration of module examinations are provided for in Appendix 1. [3]In the event of divergence from those provisions, § 12 (8) of the APSO must be complied with. [4]The assessment of the module examination is governed by § 17 of the APSO.

(3) Where Appendix 1 provides that a module examination is either in written or oral form, the examiner must inform the students in appropriate form, no later than the first day of classes, of the type of examination to be held.

(4)   Upon request of a student and with the agreement of the examiners, examinations may be taken in a different language than the course language.

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

(1)   [1]Students who are enrolled in the Master's program in Information Systems (Wirtschaftsinformatik) are deemed admitted to the module examinations of the Master's examination. [2]Also, a student is deemed admitted to certain individual module examinations if that student, during his/her consecutive Bachelor's program in Wirtschaftsinformatik at the Technische Universität München, has taken additional examinations in accordance with § 46b of the Examination and Academic Regulations for the Bachelor's program in Wirtschaftsinformatik of the Technische Universität in its current version.

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

§ 43
Scope of the Master's Examination

(1)   The Master's examination consists of:
       1. The module examinations in the corresponding modules pursuant to subsection 2,
       2. The Master's thesis pursuant to § 46.

(2)   [1]The module examinations are listed in Appendix 1. [2]At least 21 credits in required modules and at least 69 credits in elective modules must be completed. [3]The selection of modules must be in compliance with § 8 (2) of the APSO.

§ 44
Repeat Examinations, Failed Examinations

(1)   [1]The repetition of examinations is governed by § 24 of the APSO. [2]The repeat examination for a module examination administered at the end of the lecture period and not passed, as a rule must be taken no later than by the end of the first week of the lecture period of the following semester. [3]In derogation of sentence 2, the date of repeat examinations of examinations which are not offered by the Faculty of Informatics, has to comply with the regulations of the offering department.

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

§ 45
Coursework

[1]Instead of the examinations to be taken in elective modules pursuant to § 43 (2) sentence 2, successful completion of coursework may be required. [2]In this case the number of credits to be earned through examinations in elective courses pursuant to § 43 (2), sentence 2 will be reduced accordingly.

§ 45 a
Multiple Choice

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

§ 46
Master's Thesis

(1)   [1]As part of the Master's examination, each student must write a Master's thesis   pursuant to § 18 of the APSO. [2]The Master's thesis may be assigned and supervised by thesis supervisors of the Faculty of Informatics of the Technische Universität München ("Themensteller oder Themenstellerin"). [3]The thesis supervisors pursuant to sentence 2 are appointed by the examination board.

(2)   Work on the Master's thesis should commence after successful completion of all module examinations.

(3)   [1]The period of time between topic assignment and submission of the completed   Master's thesis must not exceed six months. [2]The Master's thesis is deemed taken and not passed, if it is not delivered in time and without accepted solid reasons pursuant to § 10 (7) of the APSO. [3]The Master's thesis should be written in the English language.

(4)   [1]The completion of the Master's thesis consists of a written composition and a lecture on its content. [2]The lecture does not affect the grading. [3]For the module Master's Thesis 30 Credits will be assigned.

(5)   [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]The new Master's thesis must be registered no later than six weeks after the notification of the result (Bescheid).

§ 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 pursuant to § 43 (1) have been passed and a credits account of at least 120 credits has been achieved.

(2)   [1]The grade for a module will be calculated according to § 17 of the 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. [3]The grade weights of the individual modules correspond to the credits assigned to each module. [4]The final result will be expressed by an attribute according to § 17 of the APSO.

§ 48
Degree Certificate, Diploma, Diploma Supplement

[1]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 APSO. [2]The degree certificate will be dated on the day when all examination and coursework requirements have been fulfilled .

§ 49
In-Kraft-Treten*)

(1)   [1]These Examination and Academic Regulations shall enter into force on October 01, 2018. [2]They shall apply to all students who commence their academic studies at the Technische Universität München as of the winter semester 2018/19. [3]In derogation of sentence 1, the Appendix 2: Aptitude Assessment shall apply to all students who commence their studies at the Technische Universität München as of summer semester 2019.

(2)   [11]At the same time, the Examination and Academic Regulations for the Master's program in Information Systems (Wirtschaftsinformatik) of July 08, 2008, last amended by no. 37 of the Summary Changes concerning the aptitude assessment committee of the Master's program of April 25, 2018, shall cease to be in effect. [2]Students who started their academic studies at the Technische Universität München prior to winter semester 2018/19 will complete their studies according to the Examination and Academic Regulations pursuant to sentence 1.

*) This provision concerns the entry into force of the Examination and Academic Regulations in the original version of September 28, 2018. The date of entry into force of the amendments is determined by the amending Examination and Academic Regulations.

Appendix 1: Examination Modules

The examination board may temporarily or permanently add additional elective modules to the lists of elective modules listed below. Changes will be announced on the faculty's website at the beginning of the semester at the latest.

1. Required Modules Informatics (8 Credits)

ID	Module name	Type of instruction	Sem.	SWS	Credits	Type of assessment	Duration of examination	Language of instruction
IN2309	Advanced Topics of Software Engineering	V+Ü	WiSe	4+2	8	Written exam	100-160	DE/EN

2. Required Modules Information Systems (13 Credits)

ID	Module name	Type of instruction	Sem.	SWS	Credits	Type of assessment	Duration of examination	Language of instruction
IN2087	Software Engineering for Business Applications - Master's Course: Web Application Engineering	V+Ü	SoSe	2+2	8	Projektarbeit		EN
IN2105	Business Process Technologies and Management	V+Ü	SoSe	2+2	5	Written exam	75-125	EN

3. Master's Thesis (30 Credits)

ID	Module name	Type of instruction	Sem.	SWS	Credits	Type of assessment	Duration of examination	Language of instruction
IN2109	Master's Thesis		4		30	Research Paper		DE/EN

4. Elective Modules Development Lab
A minimum of 10 credits must be earned from the following elective modules:

ID	Module name	Lehrform	Sem.	SWS	Credits	Prüfungsart	Prüfungs-dauer	Unter-richts-sprache
IN2128	Entwicklungspraktikum Unternehmenssoftware	P	WiSe/SoSe	6	10	Project work		DE/EN
IN2129	Entwicklungspraktikum Software Engineering für betriebliche Informationssysteme	P	WiSe	6	10	Project work		DE/EN
IN2130	Entwicklungspraktikum Realisierung prozessorientierter Anwendungen	P	WiSe/SoSe	6	10	Project work		DE/EN

5. Elective Modules

At least 53 credits must be earned from the following elective modules, of which
- At least 5 credits from the area of algorithms,
- At least 5 credits from the area of machine learning and data analysis,
- At least 5 credits from the area of information systems
- At least 5 credits from the area of databases and information systems,
- At least 18 credits from the area of management.

ID	Module name	Type of instruction	Sem.	SWS	Credits	Type of assessment	Duration of examination	Language of instruction
Subject Area „Software Engineering"								
IN2084	Fortgeschrittene Themen des Softwaretests	V+Ü	SoSe	2+2	5	Written exam	75-125	DE
IN2078	Grundlagen der Programm- und Systementwicklung	V	WiSe	3	4	Written exam	60-100	DE
IN2081	Patterns in Software Engineering	V+Ü	WiSe	2+2	5	Written exam	60-90	EN
IN2385	Safety and Security for Cyber-Physical Systems	V	WiSe	2	3	Written exam	60-75	EN
Subject Area „Management"								
WI000026	Advanced Technology and Innovation Management	V	WiSe	4	6	Written exam	90-150	EN
WI000091	Corporate Finance	V+Ü	SoSe	2+2	6	Written exam	90-150	EN
WI000979	Inventory Management	V+Ü	SoSe	2+2	6	Written exam	90-150	EN
WI000233	Management Accounting	V+Ü	WiSe	2+2	6	Written exam	90-150	DE
WI000813	Technology Entrepreneurship Lab	S	WiSe/SoSe	4	6	Project work		EN
WI000978	Transportation Logistics	V+Ü	WiSe	2+2	6	Written exam	90	EN
Subject Area „Algorithms"								
IN2239	Algorithmic Game Theory	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
IN2211	Auction Theory and Market Design	V+Ü	WiSe	2+2	5	Written exam	75-125	EN
IN2007	Complexity Theory	V+Ü	SoSe	4+2	8	Written exam	120-180	EN
IN2003	Efficient Algorithms and Data Structures	V+Ü	WiSe	4+2	8	Written exam	120-180	EN
Subject Area „Computer Graphics and –Vision"								
IN2354	3D Scanning & Motion Capture	V+Ü+P	WiSe/SoSe	2+1+1	6	Written exam	90-150	EN
IN2015	Image Synthesis	V	WiSe	4	5	Written exam	75-125	EN
IN2369	Industrielle Bildverarbeitung	V	WiSe	4	6	Written exam	90-150	DE
IN2026	Visual Data Analytics	V+Ü	WiSe	3+1	5	Written exam	60-90	EN
Subject Area „Databases and Information Systems"								
IN2118	Database Systems on Modern CPU Architectures	V+Ü	SoSe	3+2	6	Written exam	90-150	EN
IN2288	Event Processing	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
IN2219	Query Optimization	V+Ü	WiSe	3+2	6	Written exam	90-150	EN
IN2267	Transaction Systems	V+Ü	SoSe	3+2	6	Written exam	90-150	EN
Subject Area „Digital Biology and Digital Medicine"								
IN2021	Computer Aided Medical Procedures	V	WiSe	4	6	Written exam	90-150	EN
IN2022	Computer Aided Medical Procedures II	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
IN2293	Medical Augmented Reality	V+Ü	WiSe	2+2	5	Written exam	75-125	EN
IN2322	Protein Prediction I for Computer Scientists	V+Ü	SoSe	4+2	8	Written exam	120-180	EN
Subject Area „Formal Methods and their Applications"								
IN2041	Automata and Formal Languages	V+Ü	WiSe	4+2	8	Written exam	120-180	EN
IN2227	Compilerbau I	V+Ü	SoSe	2+2	5	Written exam	75-125	DE/EN
IN2050	Model Checking	V+Ü	SoSe	4+2	8	Written exam	120-180	EN
IN2052	Petri Nets	V+Ü	unreg	3+1	5	Written exam	75-125	EN
Subject Area „Machine Learning and Analytics"								
IN2346	Introduction to Deep Learning	V+Ü	SoSe	2+2	6	Written exam	90-150	EN
IN2357	Machine Learning for Computer Vision	V+Ü	WiSe/SoSe	2+2	5	Written exam	75-125	EN
IN2323	Machine Learning for Graphs and Sequential Data	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
IN2361	Natural Language Processing	V	WiSe	4	6	Written exam	90-150	EN

Subject Area „Computer Architecture, Computer Networks and Distributed Systems"								
IN2076	Advanced Computer Architecture	V	WiSe	4	6	Written exam	90-150	EN
IN2097	Advanced Computer Networking	V+Ü	WiSe	3+1	5	Written exam	75-125	EN
IN2073	Cloud Computing	V+Ü	WiSe	2+1	4	Written exam	60-100	EN
IN2324	Connected Mobility Basics	V+Ü	WiSe	4+2	8	Written exam	120-180	EN
Subject Area „Robotics"								
IN2222	Cognitive Systems	V+Ü	SoSe	3+1	5	Written exam	75-125	EN
IN2060	Echtzeitsysteme	V+Ü	WiSe	3+2	6	Written exam	90-150	DE/EN
IN2061	Einführung in die digitale Signalverarbeitung	V+Ü	SoSe	3+3	7	Written exam	105-175	DE/EN
IN2067	Robotics	V+Ü	WiSe	3+2	6	Written exam	90-150	EN
Subject Area „Security and Privacy"								
IN2197	Kryptographie	V+Ü	WiSe	3+1	5	Written exam	75-125	DE/EN
IN2101	Network Security	V+Ü	WiSe	3+1	5	Written exam	75-125	EN
IN2194	Peer-to-Peer-Systems and Security	V+Ü	SoSe	3+2	6	Projekt-arbeit		EN
IN2178	Security Engineering	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
Subject Area „Scientific Computing and High Performance Computing"								
IN2001	Algorithms for Scientific Computing	V+Ü	SoSe	4+2	8	Written exam	120-180	EN
IN2010	Modelling and Simulation	V+Ü	SoSe	4+2	8	Written exam	120-180	EN
IN2398	Numerical Algorithms for High Performance Computing	V+Ü	WiSe	4+2	8	Written exam	75-120	EN
IN2147	Parallel Programming	V+Ü	SoSe	2+2	5	Written exam	75-120	EN
Subject Area „Information Systems"								
IN2396	Master-Seminar Wirtschaftsinformatik	S	WiSe/SoSe	2	5	Research Paper		DE/EN
IN2359	Blockchain-based Systems Engineering	V+Ü	SoSe	2+2	5	Written exam	75-125	EN
IN2372	Introduction to Large-Scale Agile Software Development	V	WiSe	2	3	Written exam	60-75	EN
IN2089	Strategic IT Management	V	WiSe	2	3	Written exam	60-75	EN
Subject Area "Human Centered Engineering"								
IN2111	3D User Interfaces	V+Ü	SoSe	3+2	6	Written exam	90-150	EN
IN2018	Augmented Reality	V+Ü	SoSe	3+2	6	Written exam	90-150	EN
IN2241	Social Computing	V+Ü	SoSe	3+1	5	Written exam	75-125	DE/EN
Subject Area „Fundamentals"								
IN0011	Einführung in die Theoretische Informatik	V+Ü	SoSe	4+2	8	Written exam	120-180	DE/EN
IN0009	Grundlagen: Betriebssysteme und Systemsoftware	V+Ü	WiSe	3+2	5	Written exam	75-125	DE
IN0019	Numerisches Programmieren	V+Ü	WiSe/SoSe	2+3	6	Written exam	90-150	DE
Elective modules without assignment to a subject area								
IN2169	Guided Research		WiSe/SoSe		10	Research Paper		EN

(*) Maximum one of the marked modules can be chosen

6. Elective Modules - Support Electives

A minimum of 6 credits must be earned from the following elective modules :

ID	Module name	Type of instruction	Sem.	SWS	Credits	Type of assessment	Durations of examination	Language of instruction
IN9044	Datenschutz	S	WiSe	2	4	Research Paper		DE
WI000159	Business Plan - Basic Course (Business Idea and Market)	S	WiSe/SoSe	2	3	Projekt-arbeit		EN
IN9003	Informatikrecht	V	SoSe	2	3	Written exam	60-90	DE
IN9048	Innovation Generation in the Healthcare Domain	V+Ü	SoSe	2+2	6	Projekt-arbeit		EN
IN9036	Master Your Thesis!	S	WiSe	2	4	Research Paper		EN

The support elective module catalog is supplemented by further modules and by modules from the offerings of the TUM Language Center and the Carl von Linde Academy, which are announced by the examination board on the websites of the faculty.

Explanations:
Sem. = Semester; SWS = Semesterwochenstunden / weekly hours per semester; WiSe = Winter term; SoSe = Summer term; V = Vorlesung / lecture; Ü = Übung / exercise; P = Praktikum / practicum; S = Seminar / seminar; DE = German; EN = English

The duration of examinations is indicated in minutes (written and oral exams).

Appendix 2: Aptitude Assessment

Aptitude Assessment for the Master's Program in Information Systems (Wirtschaftsinformatik) at the Technische Universität München

1. Purpose of the Assessment

[1]Eligibility for the Master´s program in Information Systems (Wirtschaftsinformatik), in addition to the requirements pursuant to § 36 (1) no(s). 1 to 3, requires proof of aptitude pursuant to § 36 (1) no. 4 in accordance with the following provisions. [2]The special qualifications and skills of the candidates should correspond to the Information Systems profession. [3]Individual aptitude parameters are:

1.1 ability to do research work and/or basic research and methodological work ,

1.2 specialized knowledge from undergraduate studies in Information Systems in accordance with the Bachelor's program in Wirtschaftsinformatik at the Technische Universität München ,

1.3 ability to solve complex and difficult problems,

1.4 ability to abstract and transfer the Informatics methods in solving problems in application areas.

2. Aptitude Assessment Process

2.1 The aptitude test will be held twice a year by the Faculty of Informatics of the Technische Universität München.

2.2 [1]Applications for admission to the aptitude test together with the documents pursuant to 2.3.1 to 2.3.7 and § 36 (1) no. 2 and no. 3 must be filed online by May 31 for the winter semester and by November 30 for the summer semester to the Technische Universität München (absolute deadlines). [2]Degree certificate and diploma as proof of Bachelor's degree obtained must be filed no later than five weeks after the beginning of lectures to the TUM Center for Study and Teaching – Application and Admission. [3]Otherwise, pursuant to § 36 (1) no. 1, the enrollment to the Master's program is not yet possible

2.3 The application must include:

2.3.1 a transcript of records containing modules of at least 120 credits, or resp. of two-thirds of the examinations necessary for the undergraduate degree in case of degrees not being subject to the "European Credit Transfer and Accumulation System" (ECTS); the transcript of records must be issued by the responsible examining authority or the responsible office of academic affairs,

2.3.2 a curriculum vitae formatted as a table,

2.3.3 a written statement of no more than two DIN A4 pages in German or English of the reasons for choosing the Information Systems (Wirtschaftsinformatik) program at the Technische Universität München in which the candidate explains those specific abilities that make him / her particularly qualified for the Information Systems (Wirtschaftsinformatik) Master's program at the Technische Universität München; a candidate's exceptional commitment can e.g. be demonstrated by 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 written essay in English of approx. 1000 words in length; the chairperson of the committee may provide one topic or a selection of several topics for this essay; the candidates must be informed of the topic(s) not later than March 01 resp. September 01,

2.3.5 a declaration that both the statement of the reasons for choosing the program and the essay are the candidate´s own work, and that the candidate has clearly identified any ideas taken from outside sources,

2.3.6 the underlying curriculum (e.g. module catalog) of the undergraduate degree program,

2.3.7 a list of the applicant's best graded modules in the amount of 120 Credits (resp. two-thirds of the examinations necessary for the undergraduate degree) pursuant to 5.1.1 no. 2 incl. a sworn statement of the correctness of the information provided.

3. Aptitude Assessment Committee

3.1 [1]The aptitude assessment is administered by the aptitude assessment committee and selection committees. [2]The aptitude assessment committee shall be responsible for preparing the procedure, organizing it and ensuring a structured and standardized procedure for determining aptitude within the framework of these regulations; it shall be responsible insofar as no other responsibility is specified by these regulations or by delegation. [3]The conduct of the procedure pursuant to nos. 4 and 5 subject to no. 3.2. sentence 11 shall be the responsibility of the selection committes.

3.2 [1]The aptitude assessment committee consists of three members. [2]These are appointed by the dean in consultation with the dean of studies from among members of the Faculty of Informatics who are authorized to take examinations in the degree program. [3]At least two of the committee members must be university lecturers in the sense of the BayHSchPG. [4]The student council has the right to nominate a student representative to serve in an advisory capacity on the committee. [5]For each member of the commission, a deputy shall be appointed. [6]The commission shall elect a chairperson from among its members. [7]The course of business shall be governed by § 30 of the Grundordnung of the TUM as amended. [8]The term of office of the members is two years. [9]Extensions of the term of office and reappointments are possible. [10]The chairperson may make urgent decisions that cannot be postponed instead of the committee on the aptitude assessment; he or she must inform the committee of such decisions without delay. [11]The office of academic affairs shall support the committee for the aptitude assessment and the selection committees; the aptitude assessment committee may delegate to the office of academic affairs the task of the formal admission examination pursuant to No. 4 as well as the evaluation of points on the basis of previously defined criteria for which there is no leeway for evaluation, in particular the conversion of the grade as well as the determination of the total number of points achieved.

3.3 [1]The selection committees each consist of two members from the group of members of the Faculty of Informatics who are authorized to take examinations in the degree program according to Art. 62 (1) sentence 1 BayHSchG in conjunction with the Hochschulprüferverordnung. [2]At least one member must be a university lecturer in the sense of the BayHSchPG. [3]The activity as a member of aptitude assessment committee can be exercised in addition to the activity as a member of the selection committee. [4]The members shall be appointed by the aptitude assessment committee for a period of one year; No. 3.2. sentence 9 shall apply accordingly. [5]Different selection committees may be appointed for each criterion and level.

4. Admission to the Aptitude Assessment

4.1 Rejection due to missing or incomplete documents

Admission to the aptitude assessment requires that all documentation specified in no. 2.2 has been submitted in a timely and complete fashion.

4.2 Rejection due to missing qualification

[1]On the basis of the submitted documents according to 2.3.1 and 2.3.7, the existing competencies from the undergraduate degree are examined according to No. 1.2. [2]The curricular analysis is not carried out by schematic comparison of the modules, but on the basis of competencies. [3]It is based on the elementary subject areas listed in the following table. [4]The modules listed in the table from the Bachelor's program in Wirtschaftsinformatik at the Technische Universität München provide the benchmark for the competencies to be demonstrated in each subject group.

Subject Area	Credits TUM
Fundamentals of Information Systems (Introduction to Information Systems, Software Engineering for Business Applications, Operations Research)	16
Fundamentals of Informatics	36

(Introduction to Informatics, Programming, Software Engineering, Algorithms and Data Structures, Databases, Computer Networking and Distributed Systems)	
Fundamentals of Management (Financial Accounting and Reporting, Cost Accounting, Investment and Financial Management)	18
Fundamentals of Mathematics (Discrete Structures, Linear Algebra , Analysis, Statistics)	30

[5]If there are no essential differences with regard to the acquired competencies (learning outcomes), the candidate will be awarded a maximum of 55 points. [6]Missing competencies will be deducted in accordance with the credits of the corresponding modules of the Bachelor's program in Wirtschaftsinformatik at the Technische Universität München. [7]There will be no negative points. [8]Where a GRE or Gate test has to be submitted pursuant to § 36 (1) no. 3, it is assumed that, in case of successful demonstration, there are no substantial differences regarding the level of competencies demonstrated by the undergraduate degree compared to the reference criteria set out in 5.1.1 no. 1 sentence 2 and that the curricular analysis will be conducted according to the abovementioned criteria. [9]Whoever has achieved less than 25 points will not be admitted to the aptitude assessment. [10]Anyone who has been deducted more than 14 points in total in the subject areas "Fundamentals of Informatics" and "Fundamentals of Mathematics" will also not be admitted to the aptitude assessment. [11]Applicants who are not admitted to the aptitude assessment will receive a notification specifying the reasons and providing information on legal remedies.

4.3. Those who meet the necessary requirements will be tested in the aptitude assessment according to No. 5.

5. Aptitude Assessment Process

5.1 First stage of the Aptitude Assessment Process

5.1.1 [1]The committee 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). [2]For this purpose, the committee evaluates and grades the candidate's documentation 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:

1. **Academic Qualification**

   [1]The points from the review according to 4.2 are taken over. [2]The maximum number of points is 55.

2. **Final Grade**

   [1]For each tenth of a grade that the average grade determined for the examinations amounting to 120 credits (resp. two-thirds of the examinations necessary for the undergraduate degree) is better than 3.0, the applicant will be awarded one point. [2]The maximum number of points is 20. [3]There will be no negative points. [4]Where a degree was obtained outside of Germany, the grade will be converted according to what is referred to as „Bavarian formula" (bayerische Formel). [5]If the applicant, at the time he or she files the application, submits a final degree certificate showing more than 120 credits, the assessment will be made on the basis of the modules that were awarded the best grades, up to 120 credits (resp. two-thirds of the examinations necessary for the undergraduate degree). [6]The grade average is calculated from the graded module examinations up to 120 credits (resp. two-thirds of the examinations necessary for the undergraduate degree). [7]The overall grade average will be calculated as the weighted grade average of the modules.

[8]The grade weights of the individual modules correspond to the credits assigned to each module. [9]For the calculation of grade, one decimal place will be taken into account, all further decimal places will be dropped without rounding.

3. **Statement of Reasons**

[1]The applicant's written statement of reasons will be graded on a scale of 0 – 10 points. [2]The statement of reasons will be assessed using the following criteria:

1. Exceptional commitment:
   Demonstration of relevant qualifications which exceed the knowledge and qualifications obtained at undergraduate degree level, e.g. program-related vocational training, internships, stays abroad (cf. no. 2.3.3)

2. Specific qualification:
   Well-structured presentation of the connection between the specific personal qualification and the contents of the degree program

[3]The committee members assess each of both criteria independently; the criteria will be weighted equally. [4]The points total will be calculated as the arithmetic means of the individual assessments, rounded up to the nearest full point.

4. **Essay**

[1]The applicant's written essay will graded on a scale of 0 – 15 points. [2]The essay will be assessed using the following criteria:

a. formal and coherent structure,

b. complete and correct in content, coherent argumentation,

c. academic foundation.

[3]The committee members assess each of the three criteria independently; the three criteria will be weighted equally. [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 applicant's points total will be calculated as sum of the individual points awarded. [2]Decimal places must be rounded up.

5.1.3 [1]Applicants who have achieve at least 70 points pass the aptitude assessment. [2]In those cases where it was determined pursuant to § 36 (3) that only some subject-specific requirements from undergraduate studies are missing for the Master's program, the committee may make admission subject to successful completion of Fundamentals Exams from the Bachelor`s program in Wirtschaftsinformatik (so-called bridge courses) in the amount of a maximum of 30 credits. [3]These Fundamentals Exams must be taken in the first year of study. [4]Failed Fundamentals Exams may be repeated only once 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 Exams.

5.1.4 Those who achieve less than 50 points do not pass the aptitude assessment.

5.2 Second stage of the Aptitude Assessment Process

5.2.1 [1]The remaining applicants will be invited for an aptitude assessment interview. [2]In the second stage of the aptitude assessment process, the applicant's qualification at undergraduate level and the result of the assessment interview will be evaluated. [3]In cases where the points set out in 5.1.3 sentence 1 have not been achieved, this will also apply to applicants whose admission is subject to the requirement stipulated in 5.1.3 sentence 2. [4]Interview appointments will be announced at least one week in advance. [5]Possible time slots for interviews must be announced before expiration of the application deadline. [6]The interview appointment must be kept by the applicant. [7]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 an applicant's well-grounded 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 but not more than 30 minutes for each applicant. [3]The interview will focus on the following topics:

1. Exceptional commitment that gives reason to expect that the level of capacity obtained at the undergraduate degree level in general or at least concerning the area of specialization is exceeded noticeably (0 to 15 points):
   - Specific qualification for a concrete specialization in the field of the degree program, proved by additional modules or non-university activities (e.g. membership or activities in relevant organizations) in that area,
   - Evidence of outstanding determination in the curriculum vitae (e.g. additional subject-related internships, relation between previous occupations and the degree program),
   - Specific experience in research (e.g. specific research orientation in the previous academic studies, participation in research projects).

2. Aptitude parameters according to no. 1.1 and 1.2 (0 to 15 points)
   - Presentation of subject-related expertise, previous main study focus,
   - Qualifications acquired in the undergraduate degree program in the subject groups mentioned in 5.1.1.,
   - Topic of the final thesis.

3. Communication skills (0 to 15 points)
   - Ability to illustrate and discuss facts in a clear, fluent and adequate way,
   - Own thoughts and opinions are expressed precisely and comprehensive answers are structured logically during the interview,
   - Questions relating to the first degree and / or the main study focus are answered terminologically correct and comprehensible at the same time,
   - Statements are convincingly based on arguments and supported by reasonable examples,
   - Questions regarding scientific topics as well as one's own competencies and expectations are understood without problem or if necessary clarified through further inquiry.

[4]The above topics may cover the documentation submitted pursuant to 2.3. [5]Any subject-specific academic knowledge that is to be taught in the Master's program in Information Systems (Wirtschaftsinformatik) 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 at least two members of the committee. [2]The committee members will grade each of the three topics set out in no. 5.2.2 independently, each with the same weighting. [3]Each member will grade the result of the interview on a scale from 0 to 45, 0 being the worst and 45 being the best possible result. [4]The points total will be calculated as the arithmetic means of the individual points. [5]The result will be rounded up to the nearest full point.

5.2.4 [1]The applicant's points total in the second stage will be calculated as the sum of all points obtained under 5.2.3 and the points under 5.1.1.1 (academic qualification) and 5.1.1.2 (grade). [2]Applicants with 70 or more points pass the aptitude assessment.

5.2.5 Applicants with less than 70 points do not pass the aptitude assessment.

5.3 Notification of the result

[1]The applicant will be notified of the result of the aptitude test in writing - where applicable, subject to the requirements determined in stage 1, 5.1.3 sentence 2. [2]A rejection notice must specify the reasons for the rejection and provide information on legal remedies .

5.4 Admissions to the Master's program in Information Systems (Wirtschaftsinformatik) shall apply to all subsequent applications for this program.

6. Record

[1]The aptitude assessment process must be documented, including the date, duration and location of the assessment, the names of the committee members, the applicant's name, and the decision of the members of the committee as well as the complete results. [2]A record shall be prepared of the aptitude assessment, showing the date, duration and place of the assessment, the names of the members of the committee, the names of the applicants and the main topics of the interview in summary form.

7. Repetition

Applicants who have failed the aptitude assessment for the Master's program in Information Systems (Wirtschaftsinformatik) may register for one repetition of the aptitude assessment.