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RWTH AACHEN UNIVERSITY

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Course of Study-Specific Examination Regulations

for the joint Master's Course of Study

in Media Informatics

Offered by RWTH Aachen University

In Partnership with

the University of Bonn

Dated July 16, 2019,

in the Second Revised Version

Dated July 28, 2022,

Published as a Complete Version

Examination Regulations Version 2019

Please note that the English version of this guideline is purely for your convenience and is not legally binding. Only the German version is legally binding.

Based on §§ 2 (4, 64) of the Higher Education Act of North Rhine-Westphalia (Higher Education Act; or Hochschulgesetz - HG) in the version dated September 16, 2014 (Law and Official Gazette of the State of North Rhine-Westphalia; GV. NRW p. 547), most recently amended by Article 1 of the Act on Further Amendments to the Higher Education Act and the Art School Act dated November 25, 2021 (GV. NRW p. 1210a), RWTH Aachen University (RWTH) has issued the following regulations:

ISSUED BY DIVISION 1.1 OF DEPARTMENT 1.0 ON BEHALF OF THE RECTOR OF RWTH AACHEN UNIVERSITY
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I. General

§ 1
Scope of Application and Academic Degree

(1) These examination regulations apply to the joint Master's degree program in Media Informatics offered by RWTH and Rheinische Friedrich-Wilhelms-Universität Bonn (hereinafter referred to only as University of Bonn). They only apply in conjunction with the currently valid version of RWTH's General Examination Regulations (GER) RWTH, supplementing them with an additional set of study-specific regulations. In cases of doubt, the provisions of the general examination regulations take precedence.

(2) Upon successful completion of the Master's course of study, the academic degree of Master of Science from RWTH Aachen University (RWTH M. Sc.) is awarded.

§ 2
Objectives of the Course of Study and Language Provisions

(1) This Master's degree program builds upon the Bachelor's degree program in Computer Science in accordance with § 2 (3) GER.

(2) The overall educational objectives are set out in § 2 (1, 3, 4) GER. For further information and provisions on the objectives of this Master's program, please refer to Appendix 3 of these Course of Study-Specific Examination Regulations.

(3) The degree program is taught in English.

(4) Examinations may be taken in German or English, in agreement with the examiner in question.

§ 3
Admission Requirements

(1) One requirement for admission is a recognized first university degree according to § 3 (4) GER.

(2) To meet the subject-specific requirements that are necessary to be able to successfully complete the Master's course of study in Media Informatics, the applicant must have the necessary knowledge evidenced by credit points (CP) in the following areas:

- At least 28 CP from the field of practical computer science, including:
    a. at least 8 CP in programming,
    b. at least 8 CP in Data Structures and Algorithms,
    c. at least 6 CP in Databases and Information Systems,
    d. at least 6 CP in Software Engineering.

- At least 18 CP from the field of Computer Engineering, including:
    a. at least 6 CP in Introduction to Computer Engineering,
    b. at least 6 CP in Operating Systems and Systems Software,
    c. at least 6 CP in Data Communications and Security.
- At least 18 CP from the field of Theoretical Computer Science,
    a. at least 6 CP in Formal Systems, Automata, and Processes,
    b. at least 6 CP in Computability and Complexity,
    c. at least 6 CP in Mathematical Logic.
- At least 26 CP from the field of Mathematics, including:
    a. at least 6 CP in Discrete Structures,
    b. at least 8 CP in Calculus for Computer Science,
    c. at least 6 CP in Linear Algebra,
    d. at least 6 CP in Introduction to Applied Stochastics.

The credit points must have been gained for assessments comparable to those required by the Bachelor of Computer Science degree program taught at RWTH.

(3) In addition, proof of having completed the Graduate Record Examination (GRE) General Test is required at the time of application. In the Quantitative Reasoning measure (GRE-QR), applicants must be among the top 25% (in the 75th percentile or above) and in the Verbal Reasoning measure (GRE-VR), applicants must still be among the top 85% (above the 15th percentile) of a test cohort. Applicants who are citizens of a member state of the European Union or European Economic Area (EEA) as well as “Bildungsinländerinnen” or “Bildungsinländer”, i.e. non-German citizens who have a German school leaving certificate or university degree are exempt from this rule.

(4) For admission conditional on the completion of additional requirements, § 3 (6) GER applies. If additional requirements corresponding to more than 22 credit points are imposed, admission to the Master’s course of study will be denied.

(5) For this Master’s course of study, sufficient English language proficiency must be proven according to § 3 (9) GER.

(6) When determining whether the admission requirements are met, § 3 (12) GER applies.

(7) General regulations for the recognition of prior learning and credit are provided in § 13 GER.

§ 4
Standard Period of Study, Curriculum, Credit Points, and Scope of Study

(1) The standard period of study is four semesters (two years) full-time, including preparation of the Master’s thesis. Students can usually only commence their studies in the winter semester.

(2) The program consists of one compulsory area, four elective areas and two lab courses, at least one of which should be carried out in cooperation with one of the Fraunhofer Institutes involved in the Master's program in Media Informatics – FIT or IAIS. For successful completion of the degree program, a total of 120 credit points must be earned. The Master’s examination is comprised of the following components:

Mandatory component	Totaling at least 78 CP	18– 22 CP
Core elective area – Computer and Communication Technology		14– 22 CP
Core elective area – Multimedia Technology		14– 26 CP
Core elective area – Multimedia Use and Effect		4– 16 CP
Core elective area – Media Informatics lab courses		16– 20 CP
Core elective area – Communication Skills		12 CP
Master's thesis		30 CP
Total		**120 CP**

For lecture modules, the assignment to the above areas is based on the module catalog.

(3) The course of study, including the Master's thesis module, comprises 14 to 19 modules. All modules are defined in module catalog. The weighting of the assessments to be taken in the individual modules with respect to credit points is carried out according to § 4 (4) GER.

§ 5
Obligatory Attendance in Classes

(1) According to § 5 (2) GER, obligatory attendance can only be stipulated in courses of the following type:

1. Tutorials
2. Seminars
3. Colloquia
4. Lab courses
5. Excursions

(2) Classes with obligatory attendance in accordance with paragraph 1, shall be indicated as such in the module catalog.

§ 6
Exams and Exam Deadlines

(1) General regulations on exams and exam periods are stipulated in § 6 GER.

(2) If successful completion of modules, exams, or module components according to § 5 (4) GER is stipulated as a precondition for participation in other exams, this is indicated in the module catalog.

§ 7
Types of Exams

(1) General regulations on types of exams are included in § 7 GER.

(2) Written exams shall last a minimum of 60 minutes and a maximum of 150 minutes in accordance with 7 (3) GER. Usually, to be awarded up to 5 credit points, the written exam must last 60 to 90 minutes; for 6 or 7 credit points it must last up to 120 minutes, and for 8 or more credit points it must last more than 120 minutes.

(3) Oral exams shall last at least 15 minutes and at most 45 minutes per candidate. An oral exam may be carried out as a group exam with up to four candidates.

(4) The following applies to term papers and coursework: Depending on the topic, the term paper shall be between 5 and 20 pages long. The paper also involves giving a final oral presentation.

(5) Research papers range from 5 to 40 pages. Students are typically given from one week to three months to complete a paper.

(6) The written version of an oral presentation shall range from 1 to 40 pages. The presentation shall last for a minimum of 10 minutes and up to a maximum of 60 minutes.

(7) The following applies to colloquia in particular: A colloquium shall last for a minimum of 15 and a maximum of 45 minutes.

(8) The following applies to lab courses: Students are expected to independently apply subject-specific knowledge and methods to design, implement, and test software and hardware systems and carry out experiments and measurements. Usually, an assignment is completed in small groups in order to train the students' ability to work in a team.

(9) The examiner specifies the duration of the exam and, if applicable, other modalities of the exam at the start of the course.

(10) Admission to module exams may be conditional on the successful completion of module components in accordance with § 7 (15) GER. This is outlined for the relevant modules in the module catalog. At the start of the semester, or by the first session of the course, the instructor shall provide the students with precise criteria regarding opportunities to improve their grades by completing module components, specifically indicating the number and type of tutorials that can be taken for extra credit and the methods of correction and assessment.

§ 8
Assessment and Grading

(1) General regulations for assessing exams and the formation of grades are included in § 10 GER.

(2) If an exam consists of several partial exams, each partial exam must be passed, i.e. be completed with the grade of at least "sufficient" (4.0).

(3) A module has been passed if all associated partial exams have been passed with a grade of at least "sufficient" (4.0), and all other credit points or module components have been achieved according to the relevant course of study-specific examination regulations.

(4) The overall grade is formed taking into account all module grades and the grade of the Master’s thesis in accordance with § 10 (10) GER.

§ 9
Joint Degree Program Committee and Examination Board

(1) A joint degree program committee will be established for the course of study.

(2) The joint degree program committee is composed of:

1. three professors each from RWTH and the University of Bonn (six in total), one of whom must be a member of the Fraunhofer Gesellschaft,
2. one member each from the group of academic staff at RWTH and the University of Bonn,
3. one member from the group of the degree program's students.

(3) RWTH appoints a professorial member as chairperson of the degree program committee. The deputy is a professorial member of the University of Bonn.

(4) The joint degree program committee shall coordinate the two partner's organizational collaboration with regard to implementing and handling the joint degree program. In particular, it can make recommendations to the faculty council involved regarding the range of courses and course content, submit proposals for changes to the examination regulations, make recommendations regarding module responsibility, and make proposals for the further development and design of the study program.

(5) The responsible examination board according to § 11 GER is the Examination Board for Computer Science at RWTH Aachen University's Faculty of Mathematics, Computer Science and Natural Sciences.

(6) At least one member of the Computer Science Examination Board should be a member of the Joint Degree Program Committee.

§ 10
Repeating Exams or the Master's Thesis
Loss of the Right to Take an Exam

(1) General regulations governing retaking exams or rewriting the Master's thesis as well as the loss of the right to take exams are stipulated in § 14 GER.

(2) Modules that can be freely selected within an area (specialization, occupational field, field of application, minor) of this Master's course of study can be substituted provided this is permitted according to the module catalog. It is not possible to substitute mandatory modules.

§ 11
Deregistration, Non-Attendance, Withdrawal
Deception, Non-Compliance

(1) General provisions on deregistration, non-attendance, withdrawal, deception, or non-compliance are stipulated in § 15 GER.

(2) The following applies to deregistering from lab courses and seminars: Deregistration is possible until three weeks after the topic assignment or preliminary meeting. In the case of block courses, deregistering is possible up to the first day of the course.

II. Master's Examination and Master's Thesis

§ 12
Type and Scope of the Master's Examination

(1) The Master's examination consists of

1. the exams that are to be completed based on the structure of the course of study according to § 4 (2 and 3), and which are detailed in the module catalog, as well as
2. the Master's thesis.

(2) The Master's thesis can only be registered once the student has successfully completed

1. one of the two lab courses in the subject of media informatics,
2. the exams in the subject of communication skills, and
3. a total of 54 CP worth of assessments.

§ 13
Master's Thesis

(1) General provisions for the Master's thesis are stipulated in § 17 GER.

(2) Further details regarding the supervision of the Master's thesis are outlined in § 17 (2) GER.

(3) This thesis can usually be written in German or English, in agreement with the examiner in question.

(4) The writing time for the Master's thesis is usually six months at maximum alongside studies. In justified exceptional cases, the writing time can be extended by a maximum of up to six weeks upon application to the relevant Examination Board in accordance with § 17 (7) GER. The written work should not exceed 80 pages excluding appendices.

(5) The work required for preparing and writing the Master's thesis as well as for the colloquium shall correspond to 30 credit points.

§ 14
Acceptance and Assessment of the Master's Thesis

(1) General provisions on the acceptance and assessment of the Master's thesis are stipulated in § 18 GER.

(2) Three copies of the Master's thesis are to be submitted to the Central Examination Office by the set deadline. Printed and bound copies are to be submitted. Furthermore, the thesis must be submitted as a PDF file on a data storage device.

III. Final Provisions

§ 15
Viewing of Examination Records

The reviewing of exam documents is carried out in accordance with § 22 GER.

§ 16
Entry into Force, Publication, and Transitional Provisions

(1) These examination regulations are published in the Official Announcements of RWTH Aachen University (“Amtliche Bekanntmachungen”) and enter into force on the day after publication.

(2) These examination regulations apply to all students enrolled in the Media Informatics Master's degree program at RWTH from the 2019/2020 winter semester onwards.

(3) Students who enrolled in the Media Informatics Master’s course of study before the 2019/2020 winter semester may apply to transfer to the present examination regulations. You can study until the 2022 summer semester at the latest according to the course-specific examination regulations of June 6, 2019 in the currently valid version. After the 2022 summer semester, it is mandatory to transfer to the present examination regulations.

(4) Module components passed before the 2019/2020 winter semester are accepted for all exam attempts offered for a course.

(5) Exams and assessments completed based on the examination regulations dated May 8, 2019, in their valid version are transferred to the exams required by the present examination regulations according to the Equivalence List in Appendix 3.

Issued based on the resolutions of the Faculty Council of the Faculty of Mathematics, Computer Science, and Natural Sciences dated July 10, 2019, February 3, 2021, and July 13, 2022.

It is pointed out that, in accordance with § 12 (5) NRW HG, any claims regarding a violation of procedural or formal requirements of the regulatory or other autonomous rights of the University may no longer be asserted after one year has elapsed since the official publication of this announcement unless:

1) the announcement has not been properly published,
2) the Rectorate has objected, prior to publication, to the decision of the committee adopting the regulations,
3) the University has been previously notified about the defect of form or of procedure in a complaint, specifying the infringed legal provision and the fact which gives rise to the defect, or
4) the legal consequence of the exclusion of complaints was not pointed out in the public announcement.

The Rector
of RWTH
Aachen University

Aachen,
dated July 28, 2022

sgd. Rüdiger

Univ.-Prof. Dr. rer. nat. Dr. h. c. mult. Ulrich Rüdiger

Appendix 1:

Curriculum

Curriculum	Course Semester	CP
Compulsory section		
Introduction to Computer Graphics Designing Interactive Systems Foundations of Data Science	1st semester 1st semester 2nd semester	6 (or 8) 6 6 (or 8)
		18 – 22
Core elective section: Computer and Communication Technology		
2-4 core elective modules	1st - 3rd semester	4, 6, or 8,
		14 – 22
Core elective section: Multimedia Technology		
2-5 core elective modules	1st - 3rd semester	4, 6, or 8
		14 – 26
Core elective section: Multimedia Use and Effect		
1-3 core elective modules	1st - 3rd semester	4, 6, or 8
		4 – 16
Core elective section: Media Informatics lab courses		
Lab course Fraunhofer lab course	2nd - 3rd semester 2nd - 3rd semester	6 – 10 10
		16 – 20
Core elective section: Communication Skills		
Technical writing Seminar German course (or additional seminar(1))	1st semester 2nd - 3rd semester 2nd - 3rd semester	4 4 4
		12
Master's thesis		
Master's thesis	4th semester	30
		30
Total:		**120**

Comments:

(1) Students who have acquired their (university) entrance qualification at a German-speaking institution or are German native speakers must take an additional seminar instead of the German course offered by the RWTH Language Center for English-language Master's programs.

Appendix 2:

Course of Study Objectives

The English-language, international Master's program in Media Informatics at the Bonn-Aachen International Center for Information Technology (b-it) is offered by RWTH Aachen University and the University of Bonn in cooperation with the Fraunhofer Institutes FIT and IAIS in Sankt Augustin. This interdisciplinary program trains participants to successfully tackle emerging technical and business challenges at the intersection of computer science, data science, next-generation communications systems, and media. The program is characterized by its international orientation, its focus on IT competence, and its high degree of integration in research and teaching.

The Master's program in Media Informatics consists of five areas and a Master's thesis: Computer and Communication Technology, Multimedia Technology, Multimedia Use and Impact, Communication Skills, Media lab courses, and the Master's thesis. The first three areas focus on lectures and practice-oriented tutorials/exercises in the compulsory and core elective areas/sections of the above-mentioned fields. Communication skills include technical writing, foreign language skills (for international students: German language skills), and seminars.

The program is characterized by a significant proportion of courses embedded in both basic and applied research at the participating Fraunhofer Institutes for Applied Information Technology (FIT) and for Intelligent Analysis and Information Systems (IAIS), as well as with other research and industrial partners in the region. The last six months of the program are devoted to the master's thesis. The course contents are structured according to the ECTS (European Credit Transfer System).

Appendix 3:

Equivalence List

Abbreviation	Area
AT	Requirements
KF	Communication Skills
MA	Master's thesis
MIP	Media Informatics lab courses
MMT	Multimedia technology
MMNW	Multimedia use and impact
PB	Mandatory section
RKT	Computer and communication technology
WI	Scientific Integrity
ZP	Additional Examinations

PO 05				**PO 19**			
Area	**Identifier**	**Name**	**Credits**	**Area**	**Identifier**	**Name**	**Credits**
AUF	1110952	Stochastics	6	AUF	1110952	Stochastics	6
AUF	1113004	Mathematics Logic I	6	AUF	1113004	Mathematics Logic I	6
AUF	1114971	Analysis for Computer Scientists	8	AUF	1114971	Analysis for Computer Scientists	8
AUF	1115472	Discrete Structures	6	AUF	1115472	Discrete Structures	6
AUF	1115861	Linear Algebra	6	AUF	1115861	Linear Algebra	6
AUF	1211971	Data Structures and Algorithms	8	AUF	1211971	Data Structures and Algorithms	8
AUF	1212004	Computability and Complexity	6	AUF	1212004	Computability and Complexity	6
AUF	1214957	Programming	8	AUF	1214957	Programming	8
AUF	BrKInf	Bridging course: computer science	4	AUF	BrKInf	Bridging course: computer science	4
KF	1211974	Seminar: computer science	4	KF	1211974	Seminar: computer science	4
KF	1212324	Seminar	4	KF	1212324	Seminar	4
KF	1215734	German course	4	KF	1215734	German course	4
KF	KP20932	Technical writing	4	KF	KP20932	Technical writing	4
KF	KP20938	Additional seminar	4	KF	KP20938	Additional seminar	4
KF	MI-TeWr	Technical writing	4	KF	KP20932	Technical writing	4
KF	MI-ZuMo	Additional module	4	KF	KP20938	Additional seminar	4
MA	MA	Master's thesis	30	MA	MA	Master's thesis	30
MIP	1215759	Lab course	10	MIP	KP21162	Lab course	7
MIP	KP20937	Fraunhofer lab course	10	MIP	KP20937	Fraunhofer lab course	10
MIP	KP21165	Lab course	10	MIP	KP21162	Lab course	7
MIP	KP22031	Lab course	10	MIP	KP21162	Lab course	7
MIP	MI-Pra	Lab course	10	MIP	KP21165	Lab course	10
MIP	MI-PraFraun	Fraunhofer Institute lab course	10	MIP	KP20937	Fraunhofer lab course	10
MMNW	1211397	eLearning (computer-assisted learning) (until SS 15)	6	MMNW	1215751	Learning Technologies	6
MMNW	1211902	Process Management	4	MMNW	1211902	Process Management	4
MMNW	1212683	eBusiness - applications, architectures and standards	4	MMNW	1212683	eBusiness - applications, architectures and standards	4
MMNW	1215691	CSCW and Groupware: Concepts and Systems for Computer Supported Cooperative Work	4	MMNW	1215691	CSCW and Groupware: Concepts and Systems for Computer Supported Cooperative Work	4
MMNW	1215698	Designing Interactive Systems I	6	PB	1215698	Designing Interactive Systems I	6
MMNW	1215712	Entrepreneurship and New Media	3	MMNW	1215712	Entrepreneurship and New Media	5
MMNW	1215751	Learning Technologies	6	MMNW	1215751	Learning Technologies	6

MMNW	1215842	Data Driven Medicine - project-oriented, multidisciplinary introduction	4	MMNW	1215842	Data Driven Medicine - project-oriented, multidisciplinary introduction	4
MMNW	1216958	Business Process Intelligence	6	MMNW	1216958	Business Process Intelligence	6
MMNW	7016925	Social Data Science	6	MMNW	7016925	Social Data Science	6
MMNW	KP20890	Language, Culture and Cognition	4	MMNW	KP20890	Language, Culture and Cognition	4
MMNW	KP20930	Language, Cognition and Media	4	MMNW	KP20930	Language, Cognition and Media	4
MMNW	MI-ADVA	Applied Data Visualization and Analysis	4	MMNW	MI-ADVA	Applied Data Visualization and Analysis	4
MMNW	MI-CDA	Communication in the Digital Age	4	MMNW	MI-CDA	Communication in the Digital Age	4
MMNW	MI-DIS	Designing Interactive Systems	6	PB	1215698	Designing Interactive Systems I	6
MMNW	MI-GWET	Fundamentals of Web Engineering Technologies	4	MMNW	MI-GWET	Fundamentals of Web Engineering Technologies	4
MMNW	MI-MCP	Media and Communication Practices: Writing, Speech and Pictures	4	MMNW	MI-MCP	Media and Communication Practices: Writing, Speech and Pictures	4
MMNW	MI-MedCul	Media, Culture and Mind	4	MMNW	MI-MedCul	Media, Culture and Mind	4
MMNW	MI-SECdZ	Semiotics and Embodied Cognition in the Digital Age	4	MMNW	MI-SECdZ	Semiotics and Embodied Cognition in the Digital Age	4
MMNW	MI-SKM	Language, Cognition and Media	4	MMNW	KP20930	Language, Cognition and Media	4
MMT	1211393	The Logic of Knowledge Bases	6	MMT	1211393	The Logic of Knowledge Bases	6
MMT	1211904	Advanced Methods in Automatic Speech Recognition	6	MMT	1211904	Advanced Methods in Automatic Speech Recognition	6
MMT	1211908	Current Topics in Media Computing and HCI	6	MMNW	1211908	Current Topics in Media Computing and HCI	6
MMT	1211909	Virtual Reality	6	MMT	1211909	Virtual Reality	6
MMT	1211912	Advanced Machine Learning	6	MMT	1211912	Advanced Machine Learning	6
MMT	1211921	Computer Vision 2	6	MMT	1211921	Computer Vision 2	6
MMT	1212310	Basics of Computer Graphics	6	PB	1212310	Basics of Computer Graphics	6
MMT	1212359	Web Science	4	MMT	1212359	Web Science	6
MMT	1212361	Knowledge Representation	6	MMT	1212361	Knowledge Representation	6
MMT	1212675	Semantic Web	4	MMT	1212675	Semantic Web	4
MMT	1212684	Advanced Statistical Classification	6	MMT	1212684	Advanced Statistical Classification	6
MMT	1212688	Advanced Virtual Reality Methods	6	MMT	1212688	Advanced Virtual Reality Methods	6
MMT	1212692	Advanced Techniques of Physics-Based Animation	6	MMT	1212692	Advanced Techniques of Physics-Based Animation	6
MMT	1215680	Real-time Graphics	6	MMT	1215680	Real-time Graphics	6
MMT	1215681	iOS Application Development	6	MMT	1215681	iOS Application Development	6
MMT	1215695	Statistical Methods for Processing Natural Language	8	MMT	1215695	Statistical Methods for Processing Natural Language	8
MMT	1215696	Geometry Processing	6	MMT	1215696	Geometry Processing	6
MMT	1215699	Designing Interactive Systems II	6	MMT	1215699	Designing Interactive Systems II	6
MMT	1215724	Computer Vision	6	MMT	1215724	Computer Vision	6
MMT	1215744	Machine Learning	6	MMT	1215744	Machine Learning	6
MMT	1215750	Automatic Speech Recognition	8	MMT	1215750	Automatic Speech Recognition	8
MMT	1215840	Statistical Classification and Machine Learning	8	MMT	1215840	Statistical Classification and Machine Learning	8
MMT	1215862	Physically Based Animation	6	MMT	1215862	Physically Based Animation	6
MMT	1222419	Research Focus Class on Learning Technologies	6	MMT	1222419	Research Focus Class on Learning Technologies	6
MMT	6010452	DSP Design Methodologies and Tools	4	MMT	6010452	DSP Design Methodologies and Tools	4
MMT	7016926	Social Networks	6	MMT	7016926	Social Networks	6

MMT	7016927	Web Mining	6	MMT	7016927	Web Mining	6
MMT	9014711	Medical Image Processing	4	MMT	9014711	Medical Image Processing	4
MMT	KP20905	Humanoid Robotics	6	MMT	KP20905	Humanoid Robotics	6
MMT	KP20906	Pattern Recognition (I)	8	MMT	KP20906	Pattern Recognition (I)	8
MMT	KP20908	Pattern Recognition (II)	8	MMT	KP20908	Pattern Recognition (II)	8
MMT	KP20909	Visual Data Analysis	8	MMT	KP20909	Visual Data Analysis	8
MMT	KP20913	Game AI	8	MMT	KP20913	Game AI	8
MMT	KP20914	Intelligent Learning and Analysis Systems: Machine Learning	6	MMT	KP20914	Intelligent Learning and Analysis Systems: Machine Learning	6
MMT	KP20915	Image Editing	8	MMT	KP20915	Image Editing	8
MMT	KP20916	Technical Neural Nets	6	MMT	KP20916	Technical Neural Nets	6
MMT	KP20924	Basics of Audio Signal Processing	6	MMT	KP20924	Basics of Audio Signal Processing	6
MMT	KP20925	Introduction to Computer Graphics	8	PB	KP20925	Introduction to Computer Graphics	8
MMT	KP20929	Pattern Recognition and Machine Learning for Audio Signal Processing	6	MMT	KP20929	Pattern Recognition and Machine Learning for Audio Signal Processing	6
MMT	KP20931	Technologies for the Semantic Data Web	4	MMT	KP20931	Technologies for the Semantic Data Web	4
MMT	KP20934	User-Centered Technology Design	6	MMT	KP20934	User-Centered Technology Design	6
MMT	KP21491	Design Thinking	6	MMT	KP21491	Design Thinking	6
MMT	KP21638	Deep Learning for Visual Recognition	6	MMT	KP21638	Deep Learning for Visual Recognition	6
MMT	KP21707	Introduction to Sensor Data Fusion	6	MMT	KP21707	Introduction to Sensor Data Fusion	6
MMT	KP22665	Mining Media Data	4	MMT	KP22665	Mining Media Data	4
MMT	KP23538	Voice Assistants & Dialog Systems	4	MMT	KP23538	Voice Assistants & Dialog Systems	4
MMT	KP23559	Image Acquisition and Analysis in Neuroscience	6	MMT	KP23559	Image Acquisition and Analysis in Neuroscience	6
MMT	KP23838	Mining Media Data II	4	MMT	KP23838	Mining Media Data II	4
MMT	KP25313	Explainable AI and Applications	6	MMT	KP25313	Explainable AI and Applications	6
MMT	MI-AnaMed	Introduction to the Automatic Analysis of Media Data	4	MMT	MI-AnaMed	Introduction to the Automatic Analysis of Media Data	4
MMT	#Art-Crypt2	The Fine Art of Cryptography	8	RKT	KP20903	The Fine Art of Cryptography	8
MMT	MI-ASV	Basics of Audio Signal Processing	4	MMT	KP20924	Basics of Audio Signal Processing	6
MMT	MI-BBSA	Image Processing, Search and Analysis	8 or 16	MMT	MI-BBSA	Image Processing, Search and Analysis	8 or 16
MMT	MI-CG	Computer Graphics	8	PB	KP20925	Introduction to Computer Graphics	8
MMT	MI-CTMCHCI	Current Topics in Media Computing and Human Computer Interaction	6	MMNW	1211908	Current Topics in Media Computing and HCI	6
MMT	MI-KICS	AI for Computer Games	4 or 8	MMT	KP20913	Game AI	8
MMT	MI-SciV	Scientific Visualization	8	MMT	MI-SciV	Scientific Visualization	8
MMT	MI-STDW	Technologies for the Semantic Data Web	4	MMT	KP20931	Technologies for the Semantic Data Web	4
MMT	MI-TLMM	Deep Learning in Multimedia Pattern Recognition	8	MMT	MI-TLMM	Deep Learning in Multimedia Pattern Recognition	8
MMT	MI-UstechDes	User Centered Technology Design	6	MMT	MI-UstechDes	User Centered Technology Design	6
MMT	MI-ViRe	Introduction to Virtual Reality	6	MMT	1211909	Virtual Reality	6
RKT	1211900	IT Security 2 - Computer Security	6	RKT	1211900	IT Security 2 - Computer Security	6
RKT	1211901	IT Security 1 - Cryptographic Basics and Network Security	6	RKT	1211901	IT Security 1 - Cryptographic Basics and Network Security	6

RKT	1211903	Introduction to Bioinformatics	4	RKT	1211903	Introduction to Bioinformatics	4
RKT	1212326	Algorithmic Game Theory	6	RKT	1212326	Algorithmic game theory	6
RKT	1212337	Algorithm Analysis	8	RKT	1212337	Algorithm analysis	8
RKT	1212344	Data Mining Algorithms	6	RKT	1212344	Data Mining Algorithms	6
RKT	1212346	Mobile Internet Technology	6	RKT	1212346	Mobile Internet Technology	6
RKT	1212347	Research Focus Class on Communication Systems	6	RKT	1212347	Research Focus Class on Communication Systems	6
RKT	1212349	Communication Systems Engineering	6	RKT	1212349	Communication Systems Engineering	6
RKT	1212350	Dynamic Systems for Computer Scientists	6	RKT	1212350	Dynamic Systems for Computer Scientists	6
RKT	1212353	Functional Safety and System Reliability	6	RKT	1212353	Functional Safety and System Reliability	6
RKT	1212354	Object-Oriented Software Construction	6	RKT	1212354	Object-Oriented Software Construction	6
RKT	1212355	Software Project Management	4	RKT	1212355	Software Project Management	4
RKT	1212356	Software Quality Assurance	6	RKT	1212356	Software Quality Assurance	6
RKT	1212645	Online Algorithms	6	RKT	1212645	Online Algorithms	6
RKT	1212660	Mobile Communication	6	RKT	1212660	Mobile Communication	6
RKT	1212673	Advanced Data Models	6	RKT	1212673	Advanced Data Models	6
RKT	1212678	Social Computing	6	RKT	1212678	Social Computing	6
RKT	1212681	Security in Mobile Communications	6	RKT	1212681	Security in Mobile Communications	6
RKT	1212706	Scientific Data Management	6	RKT	1212706	Scientific Data Management	6
RKT	1215686	Model-Based Software Development	6	RKT	1215686	Model-Based Software Development	6
RKT	1215688	Advanced Internet Technology	6	RKT	1215688	Advanced Internet Technology	6
RKT	1215690	Embedded Systems	6	RKT	1215690	Embedded Systems	6
RKT	1215692	Implementation of Databases	6	RKT	1215692	Implementation of Databases	6
RKT	1215694	Artificial Intelligence	6	RKT	1215694	Artificial Intelligence	6
RKT	1215720	High-Performance Computing	6	RKT	1215720	High-Performance Computing	6
RKT	1215725	Parallel Programming I	6	RKT	1215725	Parallel Programming I	6
RKT	1216861	Introduction to Data Science	6	RKT	1216861	Introduction to Data Science	6
RKT	1220136	Advanced Process Mining	6	RKT	1220136	Advanced Process Mining	6
RKT	1220996	Introduction to Numerical Methods and Software	6	RKT	1220996	Introduction to Numerical Methods and Software	6
RKT	1221327	Introduction to Algorithmic Differentiation	6	RKT	1221327	Introduction to Algorithmic Differentiation	6
RKT	1221328	Advanced Algorithmic Differentiation	6	RKT	1221328	Advanced Algorithmic Differentiation	6
RKT	1222882	Model-Based Systems Engineering	6	RKT	1222882	Model-Based Systems Engineering	6
RKT	1226006	Distributed Ledger Technology	4	RKT	1226006	Distributed Ledger Technology	4
RKT	1226146	Data Stream Management and Analysis	6	RKT	1226146	Data Stream Management and Analysis	6
RKT	4026526	Reinforcement Learning and Learning-based Control	6	RKT	4026526	Reinforcement Learning and Learning-based Control	6
RKT	6010380	Mobile Radio Networks 1	4	RKT	6010380	Mobile Radio Networks 1	4
RKT	6010396	Ad-Hoc Networks: Architectures and Protocols	4	RKT	6010396	Ad-Hoc Networks: Architectures and Protocols	4
RKT	6010406	Principles and Architectures of Cognitive Radios	4	RKT	6010406	Principles and Architectures of Cognitive Radios	4
RKT	6010414	Advanced Methods of Cryptography	8	RKT	6010414	Advanced Methods of Cryptography	8
RKT	6010457	Communication Protocols	4	RKT	6017116	Communication Protocols	4
RKT	6011250	Cryptography	3	RKT	6011250	Cryptography	3

RKT	6017116	Communication Protocols	4	RKT	6017116	Communication Protocols	4
RKT	KP20903	The Fine Art of Cryptography	8	RKT	KP20903	The Fine Art of Cryptography	8
RKT	KP20904	Fundamentals of Data Science	8	PB	KP20904	Fundamentals of Data Science	8
RKT	KP20911	Big Data Analytics	6	RKT	KP20911	Big Data Analytics	6
RKT	KP20912	Knowledge Graph Analysis	6	RKT	KP20912	Knowledge Graph Analysis	6
RKT	KP20926	Data Science and Big Data	6	RKT	KP20926	Data Science and Big Data	6
RKT	KP20927	Intelligent Learning and Analysis Systems: Data Mining & Knowledge Discovery	6	RKT	KP20927	Intelligent Learning and Analysis Systems: Data Mining & Knowledge Discovery	6
RKT	KP20928	Cryptography	8	RKT	KP20928	Cryptography	8
RKT	MI-ArtCry-Lat	The Fine Art of Cryptography	8	RKT	KP20903	The Fine Art of Cryptography	8
RKT	MI-ArtofCry	The Art of Cryptography	8	RKT	KP20903	The Fine Art of Cryptography	8
RKT	MI-BDA	Big Data Analytics	6	RKT	KP20911	Big Data Analytics	6
RKT	MI-Com-mEng	Communication Systems Engi-neering	6	RKT	1212349	Communication Systems Engi-neering	6
RKT	MI-DatS-cibig	Data Science and Big Data	6	RKT	KP20926	Data Science and Big Data	6
RKT	MI-DCIT	Data Communication and Inter-net Technology	6	RKT	MI-DCIT	Data Communication and Inter-net Technology	6
RKT	MI-ILADMW	Intelligent Learning and Analysis Systems: Data Mining & Knowledge Discovery	6	RKT	KP20927	Intelligent Learning and Analysis Systems: Data Mining & Knowledge Discovery	6
RKT	MI-Ingreq	Organizational Requirements Engineering	4	RKT	MI-Ingreq	Organizational Requirements Engineering	4
RKT	MI-INS	Intelligent Information Systems	4 or 8	RKT	MI-INS	Intelligent Information Systems	4 or 8
RKT	MI-Krypt	Cryptography	8	RKT	KP20928	Cryptography	8
RKT	MI-O-OSC	Object-Oriented Software Con-struction	6	RKT	1212354	Object-Oriented Software Con-struction	6
RKT	MI-TIS	Temporal Information Systems	4	RKT	MI-TIS	Temporal Information Systems	4
RKT	MI-TSK	In-Depth Topics of Software De-sign	4 or 6	RKT	MI-TSK	In-Depth Topics of Software De-sign	4 or 6
WI	3122938	Scientific Integrity	0	WI	3122938	Scientific Integrity	0
ZP	SA	Science Assistant	0	ZP	SA	Science Assistant	0
ZP	ZU	Additional Examinations	0	ZP	ZU	Additional Examinations	0

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