FSB (Subject-Specific Provisions) for the Mathematics International Master of Science Degree Programme

(120 ECTS credits)

at Julius-Maximilians-Universität Würzburg

dated 13 July 2015

This document is available for download at: https://www.mathematik.uni-wuerzburg.de/studium/studiengaenge-im-ueberblick/mim/overview-and-structure-of-the-programme/

Article 13 Subarticle 1 Sentence 2 in conjunction with Article 58 Subarticle 1 and Article 61 Subarticle 2 Sentence 1 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG) dated 23 May 2006 (*Bayerisches Gesetz- und Verordnungsblatt* (Bavarian Law and Ordinance Gazette, GVBI, p. 245, *Bayerische Rechtssammlung* (Collection of Bavarian Laws, BayRS) 2210-1-1-WFK) as amended from time to time forms the framework for the following subject-specific provisions decreed by Julius-Maximilians-Universität Würzburg.

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Part 1: General Provisions

Section 1 Scope

These subject-specific provisions (FSB) shall supplement the ASPO (General Academic and Examination Regulations) for the Bachelor's and Master's Degree Programmes offered by Julius-Maximilians-Universität Würzburg (JMU) dated 1 July 2015 as amended from time to time.

Section 2 Aims and Objectives of the Degree Programme, Learning Outcomes

(1) The Mathematics International programme leading to the degree of Master of Science (MSc) is offered by the Faculty of Mathematics and Computer Science at JMU as an English-taught, research-based course.

(2) Having successfully completed the programme, graduates shall possess the following skills and knowledge:

- The capacity for abstract and precise analytical thinking
- The proven ability to structure complex interrelationships
- The sound ability to apply mathematical methods to specific questions independently
- Advanced problem-solving skills and perseverance when solving difficult problems
- The ability to conduct more detailed scientific work independently
- An insight into the interrelationships of various sub-areas of mathematics within the overall field of mathematics and into interdisciplinary interrelationships
- An insight into and an overview of current research in at least one sub-area of mathematics
- The capacity for responsible teamwork in research and development in an international environment
- The ability to communicate and present complex content in English

Section 3 Start, Structure and Standard Length of Programme

(1) In accordance with Section 7 ASPO, the Mathematics International programme offers both winter and summer intake in any given academic year.

(2) The programme is structured as follows:

Area or sub-area	*ECTS credits*	
Mandatory electives	90	
Mathematics		30-70
Working groups and seminars		20-60
Area of degree finalisation	30	
Total	120	

[2]Students shall thereby successfully complete modules with graded assessments on a scale of at least 45 ECTS credits in the mandatory electives.

(3) The standard length of programme for the Mathematics International programme shall be four semesters, in which students shall earn a total of 120 ECTS credits.

Section 4 Prerequisites for Admission to the Programme, Recommended Fundamental Knowledge and Skills

(1) Admission to the Mathematics International programme shall be conditional on:

a) A Bachelor's degree (180 ECTS credits) completed at JMU or another higher education institution in Germany or abroad or an equivalent German or foreign qualification (e.g. State Examination) and

b) Proof of

aa) Competences on a scale totalling at least 70 ECTS credits from modules in the following sub-areas of mathematics: Analysis (differential and integral calculus in one and several variables), ordinary differential equations, partial differential equations, vector analysis, complex analysis, linear algebra, algebra, number theory, geometry, discrete mathematics, functional analysis, numerical mathematics, stochastics, financial mathematics, operations research, optimisation, modelling, scienctific computing;

bb) Competences on a scale of at least 10 ECTS credits in the sub-areas indicated under Letter aa) or other sub-areas of mathematics in addition to the ECTS credits specified under Letter aa);

cc) Competences on a scale of at least 30 ECTS credits from further modules in all sub-areas of mathematics or modules from other subjects where mathematical methods are essentially applied (e.g. biology, chemistry, geography, computer science, aerospace informatics, physics, business management/economics)

according to the ECTS credits scheme used at JMU for the BSc programmes in Mathematics, Computational Mathematics and Mathematical Physics (as a rule acquired in the framework of the first degree indicated under Letter a)). The required competences are taught, for example, in the framework of the BSc in Mathematics (180 ECTS credits), the BSc in Computational Mathematics (180 ECTS credits) and the BSc in Mathematical Physics (180 ECTS credits) at JMU; and

c) Proof of adequate proficiency in the English language, for example:

aa) Test of English as a Foreign Language (TOEFL) with at least 79 internet-based TOEFL points or at least 550 paper-based TOEFL points or

bb) International English Language Test System (IELTS) with a result of 6.5 or higher or

cc) Cambridge First Certificate in English (FCE) or

dd) A grade in English of at least 'Satisfactory' (*befriedigend*; equivalent to at least 7 out of 15 points) as part of a German higher education entrance qualification or

A foreign higher education entrance qualification with proof of English language proficiency which is at least equivalent to the above-mentioned higher education entrance qualification or

ee) Proof that training (in particular in the framework of the first degree indicated under a)) has been undertaken or is being undertaken which demands English language skills on the level specified in aa) to dd).

In addition to proof of English language proficiency, students shall be expected to provide proof of basic knowledge of the German language at the latest by the end of the re-enrolment period for the third subject semester.

(2) [1]Applications for admission to the Mathematics International programme in the respective following semester shall be submitted to the chairperson of the examination committee (cf. Subsection 4) for the Mathematics International programme in the form and by the closing date specified, i.e. by 15 July (for the winter semester) or 15 January (for the summer semester); in

particular, an electronic application procedure via the relevant JMU websites may be foreseen here. [2]Should there be reasons beyond the applicant's control, the documents referred to in Subsection 3 No. 1 Letter a) and c) may be submitted later and by 15 September at the latest (for the winter semester) or 15 March (for the summer semester) in order to be granted final admission to the Mathematics International programme. [3]In the event that the applicant cannot meet this closing date (e.g. because the Bachelor's degree certificate has not yet been issued), the only remaining option shall be admission subject to a resolutive condition in accordance with the rules of Subsection 7.

(3) Applications shall include:

1. Academic achievements from the first degree as specified in Subsection 1 Letter a):
   a) Proof of a university degree or an equivalent qualification (in the case of applications for final admission to the Master's programme) or
   b) Proof of 150 ECTS credits or – in the case of programmes not modularised within the meaning of the ECTS – academic achievements on a corresponding scale (in the case of applications for admission to the Master's programme subject to a resolutive condition).
2. An overview of previous study and examination achievements (transcript of records) detailing the modules passed which are relevant to the Mathematics International programme and the examination achievements attributed to them, including the ECTS credits and grades awarded as well, if applicable, as accredited examination achievements or in the case of applications for admission to the Master's programme subject to a resolutive condition a provisional overview of previous study and examination achievements with the details referred to above. It must above all be clear from the transcript that the applicant has acquired the competences required for the Mathematics International programme in accordance with Subsection 1 Letter b) (in the case of an application for final admission to Master's programme) or Subsection 7 Sentence 1 Letter b) (in the case of an application for admission to the Master's programme subject to a resolutive condition); and
3. Proof of English language skills as specified in Subsection 1 Letter c).

(4) [1]The examination committee for the Mathematics International programme shall decide whether the requirements set out in Subsection 1 Letter a), the required minimum competences (Subsection 1 Letter b)) and the requirements regarding language skills (Subsection 1 Letter c)) are met. [2]The provisions of Section 14 ASPO shall apply mutatis mutandis. [3]The examination committee may, in the performance of its duties, avail itself of other persons authorised to administer university examinations. [4]When deciding on the equivalence of first degrees with the above-mentioned reference qualification as well as for verifying the required minimum competences and their scale (in particular in the case of non-modularised programmes), the principle of reverse burden of proof and the obligation to establish equivalence shall apply in accordance with Article 63 *Bayerisches Hochschulgesetz* (Bavarian Higher Education Act, BayHSchG), insofar as there are no significant differences with regard to the competences acquired (learning outcomes).

(5) [1]In the case that the requirements set out in Subsection 1 Letter a), b) and/or c) are not met, admission to the Mathematics International programme shall not be possible, unless admission to the Master's programme is possible in accordance with Subsection 7. [2]In this case, applicants shall receive corresponding notification stating the reasons for non-admission and instructions on the available legal remedies.

(6) If the requirements set out in Subsection 1 Letter a), b) and c) are met, the applicant shall be admitted to the Mathematics International programme.

(7) [1]In order to facilitate an uninterrupted transition from a Bachelor's degree to the Master's programme, applicants who are not yet able to produce corresponding proof of the degree required in accordance with Subsection 1 Letter a) at the time of application may be admitted to

the Master's programme in the semester immediately following, subject to a resolutive condition as follows:

a) Proof at the time of application of at least 150 ECTS credits in the first degree required in accordance with Subsection 1 Letter a) and

b) Proof of

aa) Competences on a scale totalling at least 70 ECTS credits from modules in the following sub-areas of mathematics: Analysis (differential and integral calculus in one and several variables), ordinary differential equations, partial differential equations, vector analysis, complex analysis, linear algebra, algebra, number theory, geometry, discrete mathematics, functional analysis, numerical mathematics, stochastics, financial mathematics, operations research, optimisation, modelling, scienctific computing;

bb) Competences on a scale of at least 10 ECTS credits in the sub-areas indicated under Letter aa) or other sub-areas of mathematics in addition to the ECTS credits specified under Letter aa);

cc) Competences on a scale of at least 30 ECTS credits from further modules in all sub-areas of mathematics or modules from other subjects where mathematical methods are essentially applied (e.g. biology, chemistry, geography, computer science, aerospace informatics, physics, business management/economics)

according to the ECTS credits scheme used at JMU for the BSc programmes in Mathematics, Computational Mathematics and Mathematical Physics (as a rule acquired in the framework of the first degree indicated under Letter a)). The required competences are taught, for example, in the framework of the BSc in Mathematics (180 ECTS credits), the BSc in Computational Mathematics (180 ECTS credits) and the BSc in Mathematical Physics (180 ECTS credits) at JMU; and

c) Proof of adequate proficiency in the English language, for example:

aa) Test of English as a Foreign Language (TOEFL) with at least 79 internet-based TOEFL points or at least 550 paper-based TOEFL points or

bb) International English Language Test System (IELTS) with a result of 6.5 or higher or

cc) Cambridge First Certificate in English (FCE) or

dd) A grade in English of at least 'Satisfactory' (*befriedigend*; equivalent to at least 7 out of 15 points) as part of a German higher education entrance qualification or

A foreign higher education entrance qualification with proof of English language proficiency which is at least equivalent to the above-mentioned higher education entrance qualification or

ee) Proof that training (in particular in the framework of the first degree indicated under a)) has been undertaken or is being undertaken which demands English language skills on the level specified in aa) to dd).

In addition to proof of English language proficiency, students shall be expected to provide proof of basic knowledge of the German language at the latest by the end of the re-enrolment period for the third subject semester.

[2]In the event that the resolutive condition takes effect, i.e. that proof of the first degree specified in Subsection 1 Letter a) is not produced at the latest by the end of the re-enrolment period for the third subject semester of the Mathematics International programme leading to the degree of Master of Science (120 ECTS credits), the applicant is to be disenrolled at the end of the second subject semester. [3]In the event that the resolutive condition does not take effect, final admission to the Mathematics International programme is possible.

Section 5 Minimum ECTS Score Requirement

These FSB do not prescribe a minimum ECTS score requirement as described in Section 13 Subsection 5 ASPO.

Section 6 Examination Committee

In accordance with Section 14 Subsection 1 Sentence 3 ASPO, the examination committee for the Mathematics International programme shall comprise three members.

Part 2: Assessments

Section 7 Other Subject-Specific Assessments

There shall be no other subject-specific assessments.

Section 8 Area of Degree Finalisation: Master's Thesis and Master's Defence

(1) [1]The Master's thesis shall be worth 30 ECTS credits. [2]The time allowed for completion of the thesis shall be six months. [3]The supervisor of the Master's thesis may make the assignment of the topic for the thesis dependent on proof of successful participation in specific modules relevant to the respective topic. [4]The examinee shall provide the supervisor with proof of successful participation in these modules at the latest at the signing of the confirmation in accordance with Section 26 Subsection 3 Sentence 5 ASPO. [5]Without such proof, the topic for the Master's thesis shall not be assigned to the examinee.

(2) By way of derogation from Section 26 Subsection 9 Sentence 1 ASPO, the Master's thesis shall be presented in English.

Section 9 Overall Grade, Grade in Degree Subject and Grades Awarded for Individual Areas

[1]A student's overall grade shall be calculated in accordance with the provisions of Section 35 Subsection 1 ASPO. [2]The grade for the degree subject (Mathematics International) shall be calculated in accordance with Section 35 Subsection 2 ASPO, the grades for the individual areas shall be calculated in accordance with Section 35 Subsection 3 to 5 ASPO. [3]When calculating the grades for the mandatory electives, the "basket model" described in Section 35 Subsection 5 Sentences 7 and 8 ASPO shall apply.

[4]When calculating the grade for the degree subject and the overall grade, the individual areas shall be assigned the following weight values:

Area or sub-area	*ECTS credits*		*Weight value for*		
			Area	*Grade in degree subject*	*Overall grade*
Mandatory electives	90			90/120	120/120
Mathematics		30-70			
Working groups and seminars		20-60			
Area of degree finalisation	30			30/120	

Total	120				

Part 3: Final Provisions

Section 10 Entry into Force

[1]These FSB shall enter into force on the day following their announcement. [2]They shall apply to all students enrolled in the Mathematics International programme that leads to the award of the degree of Master of Science (120 ECTS credits) who commence studies in that programme at JMU in the 2015/2016 winter semester or later and whose programmes are governed by the ASPO (General Academic and Examination Regulations) for the Bachelor's and Master's Degree Programmes offered by Julius-Maximilians-Universität Würzburg dated 1 July 2015 as amended from time to time.

Appendix SFB