Faculty of Physics:

After resolutions of the Faculty Council of the Faculty of Physics of 05/06/2019 and 15/07/2019 and after statement of the Senate of 14/08/2019 the Presidential Board of the Georg-August-Universität Göttingen approved the examination and study regulations for the consecutive Master programme “Matter to Life” on 27/08/2019 (§ 44 Paragraph 1 Sentence 2 NHG in the version of the announcement of 26/02/2007 (Nds. German legal and regulatory code. p. 69), last amended by Article 10 of the Act dated 18/12/2018 (Nds. German legal and regulatory code. P. 317); § 41 section 2 sentence 2 NHG, § 37 section 1 sentence 3 no. 5 b) NHG, § 44 section 1 sentence 3 NHG).

Study and Examination Regulations for the consecutive Master degree programme in “Matter to Life” of the Georg-August-Universität Göttingen

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§ 1 Scope

(1) The “General examination regulations for Bachelor and Master degree programmes as well as other courses and degrees offered at the University of Göttingen” (APO) shall apply as amended to the consecutive Master degree programme “Matter to Life” at the University of Göttingen.

(2) These regulations specify the further provisions for the completion of studies in the consecutive Master degree programme “Matter to Life” of the Georg-August-Universität Göttingen.

§ 2 Objectives of the academic programme, purpose of the examination; occupational fields

(1) [1]Following a completed natural science or engineering course of studies with a “Bachelor of Science” (e.g. in chemistry, physics, molecular biology, biochemistry, material sciences) or “Bachelor of Engineering” (e.g. in molecular systems engineering, bioengineering), the course of studies prepares students for independent work in research and application-oriented physically influenced occupational fields. [2]In the broad-based course of studies “Matter to Life” , students receive a research-oriented multidisciplinary education which integrates contents of physical chemistry, molecular systems and engineering as well as life sciences, in addition to a sound education in physics with a focus on biophysics and physics of complex systems. To ensure this interdisciplinarity, the focus of the Master degree programme “Matter to Life” includes the following scientific topics:

- Biophysics,
- Dynamics of complex systems,
- Basic physical chemistry of life,
- Synthetic biology.

[3]Specialised knowledge and methodological skills are acquired, and these are to be applied to independently solve demanding problems in the field of biophysics and physics of complex systems. [4]Working methods and contents of the biophysics and physics of complex systems are presented in such a way that the job-related application of this knowledge and skills is fostered in very different areas. [5]The consecutive Master degree programme is principle-oriented and allows for the rapidly changing requirements of professional practice with its selection of academic profiles. [6]The training not only enables familiarization with the various problem presentations and varying areas of responsibility of later professional life, it also promotes effective communication with specialists with different orientations.

(2)[1]The master examination determines whether the candidates have acquired the comprehensive specialised knowledge and in-depth special knowledge of the field which is

required for transitioning into professional practice as a biophysicist and the capacity for independent academic work. [2]The Master examination provides a professional and research-oriented degree, which, in particular, provides the requirements for independent scientific work as part of doctoral studies.

(3) [1]The objective of master education is the acquisition of scientific competence which facilitates the resolution of problems in biophysics and physics of complex systems using the methods of physics. [2]A variety of fields of activity are open to the successful graduate of a Master course of studies, ranging from the application and development of physical methods in the field of high technology and medicine, to complex planning and organisational tasks, to fundamental research at research institutes and universities.

§ 3 Academic degree

Once the master's degree examination is passed, the University of Göttingen awards the university degree "Master of Science" (abbreviated: M.Sc.).

§ 4 Start of programme; Structure of the academic programme

(1) The academic programme starts with the winter semester.

(2) The standard course length is 4 semesters

(3) The consecutive Master degree programme “Matter to Life” is not suitable for part-time study.

(4) [1]The academic programme includes a total of at least 120 C which are distributed as follows:

a) 59 C for subject-related courses (compulsory and optional modules),
b) 22 C for practical modules,
d) 9 C for the area of professionalisation; and
c) 30 C for the master thesis

[2]More specific details are regulated in the module overview (Appendix I).

(5) The language of instruction and examination is English.

(6) [1]The study and examination components must be completed in compulsory modules and optional modules. [2]These modules are specified in the module overview (appendix 1). [3]For recommendation on the appropriate academic programme structure, please refer to the study schedule enclosed in appendix II. [4]The module index is published separately. It forms part of this regulation in as far as the modules are listed in the module overview (appendix I).

§ 5 Inter-locational cooperation; “Max Planck School”

[1]The Master “Matter to Life” degree programme is integrated into the Max Planck School “Matter to Life”, a supra-regional research and education network of the Ruprecht-Karls-University Heidelberg, the Technical University Munich, the Georg-August University of Göttingen, several Max Planck Institutes and other research institutions outside the university. [2]The participating universities each offer a corresponding Master degree programme. [3]While the degree programme in Göttingen focuses on biophysics and the physics of complex systems, the Heidelberg site focuses on “Molecular Systems Chemistry and Engineering” and the Munich site on “Molecular / Cellular Biophysics, Bioengineering”. [4]The participating universities will enable students from other locations of the network to attend courses offered as far as capacities are available or offer individual modules in the distance learning model.

§ 6 Course unit types and means of transmission

(1) The modules offered in the Master academic programme “Matter to Life” are comprised of course units of the following types:

a) lectures (V),

b) tutorials on lectures (Ü),

c) practical courses (P),

d) seminars (S).

a) Lectures are used for conveying fundamental and specialist scientific knowledge and methodological understanding by means of coherent presentation of larger sub-sections of subject area. They open the way to broadening and deepening knowledge in private study.

b) Tutorials will be offered in conjunction with the lectures. They give students the opportunity, in working on illustrative problems, to apply and consolidate the material they have worked on and to self-monitor their level of knowledge.

c) Practical courses have the objective of conveying methodological knowledge, promoting understanding of the interrelations between facts by inductive understanding of physical interrelations and building experience by working on practical tasks. The experimental demonstration, consolidation and application of the material that has been worked on and the transmission of fundamental knowledge and skills in the implementation and evaluation of physical experiments and the interpretation of their results take place in a practical course.

d) Seminars address the treatment of special technical problems. In them, the students are expected to learn how to work on complex scientific questions independently and to give a talk on this in front of specialists of their own subject and other subjects in an appropriate manner and also to acquire the ability for critical scientific discussion.

§ 7 Examination board

[1]The Faculty of Physics shall form a joint examination board for the “Physics” bachelor's degree programme and the consecutive “Physics” Master degree programme and the consecutive “Matter to Life” Master degree programme to organise the examinations and to perform all the responsibilities assigned by the APO and these examination and study regulations. [2]More specific details shall be regulated by the examination and study regulations for the “Physics” bachelor's degree programme.

§ 8 Examination organisation

(1) [1]The implementation and organisation of the examination procedure is delegated to the Examination Office of the Faculties of Mathematics and the Natural Sciences of the University of Göttingen without prejudice to the competencies of the Dean of Studies. [2]It also maintains the examination records.

(2) [1]The location and time of module examinations shall be determined by the Dean of Studies based on proposals from the responsible examiners, communicated to the examination office and announced by the examination office in the form determined by the examination board. [2]The examination board shall determine a registration and deregistration period for each examination period.

(3) [1]Registration for module examination shall be made using the examination management system within the registration period. [2]Cancellation without statement of reasons (deregistration) is possible within the deregistration period; deregistration is otherwise ruled out.

§ 9 Subject-specific examination types

Besides the examination components allowed according to the provisions of APO, the following subject-specific examination components can be planned:

a) Report:

Candidates are required to keep a report in text form to document the contributions they made to the planning, implementation and evaluation of the projects and to keep records of the results in a technically suitable form. The report in text form will be assessed by the examiner leading the project.

b) Record:

Candidates are expected to document in text form any contributions they have made independently in the planning, implementation and evaluation of internship experiments and to present the results in text form in a technically appropriate manner. The record will be assessed by the examiner leading the project.

c) Poster presentation:

In a poster presentation, the contributions independently made to the research project shall be initially presented in the form of a large poster in the usual scientific manner (scientific poster). Subsequently, the results will be orally presented on the basis of the poster. The poster presentation will be assessed by the examiner leading the project.

§ 10 Repeatability of examinations

(1) [1]Deviating from § 16 a section 1 APO, module examinations on “Matter to Life” modules (module numbers M.MtL. [digits]) which have not been passed or are deemed to have been failed, as well as the Master thesis may be repeated once each time; module examinations on modules in physics (module numbers B.Phy. [digits], M.Phy. [digits]) which have not been passed or are deemed to have been failed may be repeated three times. [2]Any failed attempts at other universities are to be credited in this regard.

(2) Notwithstanding subsection 1 clause 1, a maximum of two failed module examinations on “Matter to Life” modules (module numbers M.MtL. [digits]) may be repeated a second time.

§ 11 Voluntary additional module examination

(1) [1]The candidate is entitled to acquire a performance record and take examinations in modules (additional modules) other than those required. [2]They will then be listed in the certificate and in the transcript of records.

(2) Additional modules will not be considered in the calculation of the final grade for the master examination.

§ 12 Master thesis

(1) The Master thesis is intended to demonstrate that the candidate is able to work on a biophysical problem using established methods within a specified period of time, to arrive at academically sound results and to present these results in an adequate formal and linguistic manner.

(2) A prerequisite for admission to the Master thesis is the acquisition of a total of at least 70 C from compulsory and optional required modules of the degree programme.

(3) [1]The Master thesis is to be started following the corresponding research internship. [2]The preliminary topic of the Master thesis is to be agreed upon with an authorised examiner for the “Matter to Life” degree programme, who will also supervise the thesis. [3]A research assistant can collaborate in the supervision. [4]If the candidate does not find an academic advisor, this and the topic of the master thesis shall be determined by the examination board upon application from the candidate. [5]The candidate's view should be considered in choosing the

topic. [6]The right to make a proposal for the choice of topic does not result in any legal entitlement.

(4) [1]An application must be made in text format to the examination board for admission to the Master thesis. [2]The following material must be enclosed with the application:

a) verification of fulfilment of the requirements according to section 2, insofar as the required achievements are not defined in the examination management system,

b) topic proposal for the master thesis,

d) confirmation from the academic advisor,

b) a proposal for two evaluators,

e) a declaration specifying that the master examination has not been failed definitively or registered as definitively failed in the same or comparable master's degree programme at a domestic or foreign university.

[3]The proposals under letters b) and d) as well as the proof as specified under letter c) are unnecessary if the student provides assurance that he or she has been unable to find an academic advisor.

(5) [1]The examination board shall decide on admission. [2]This should be rejected if the qualifications for entry are not fulfilled or the master examination in the same or similar degree programme at a domestic or foreign university has been definitively failed. [3]The examination board shall determine two evaluators for the master thesis, taking into consideration the proposal provided by the candidate.

(6) [1]Upon admission, the academic advisor will issue the topic for the master thesis. [2]The time of issue must be recorded.

(7) [1]The time to complete the thesis is 6 months. [2]Upon application by the candidate, the examination board can extend the deadline for submitting the thesis by a maximum of 8 weeks in the event of an important reason that cannot be attributed to the candidate. [3]An important reason normally exists in the case of an illness that is to be notified immediately and demonstrated by producing a medical certificate.

(8) [1]The topic can be returned only once and only within the first two months of the time allotted for completing the thesis. [2]A new topic must be agreed on without delay. [3]In the event that the master thesis is repeated, the topic may be returned only in accordance with clause 1 if the examinee has not resorted to this option in the first submission of the master thesis.

(9) [1]The Master thesis must be submitted to the examination office concerned within the deadline. [2]The Master thesis must be submitted in written form in the format of a commonly used word processing programme or in PDF format (unprotected). [3]The time of submission should be recorded. [4]Upon submission, the candidate should declare in writing that he or she has independently compiled the work and has not used any sources and tools other than those specified.

(10) [1]The examination office shall forward the master thesis to the evaluator. [2]Each evaluator will award a grade. [3]The duration of the assessment procedure should not exceed 6 weeks.
(11) The Master thesis must be written in English.

§ 13 Grade point average; peremptory failure

(1) The Master examination is passed, if at least 120 credits were acquired and all of the required module examinations as well as the Master thesis have been passed.
(2) [1]The right to be examined, in addition to the cases specified under APO, shall lapse definitively in the following cases:
a) by the end of the 1st subject semester, the student has not earned at least 15 C
b) by the end of the second subject semester, fewer than 30 C have been acquired or
c) by the end of the 8th subject semester, all credits that are required to pass the master examination have not been acquired.
[2]In this case, the master examination is regarded as definitively failed. [3]Exceeding the deadlines mentioned in sentence 1 is allowed if the student is not responsible for missing the deadline. [4]The examination board decides on this upon application by the student.

§ 14 Study advisory service

(1) The Central Office of Student Affairs for the University of Göttingen offers an advisory service for general questions on study aptitude, course admission and subjects. Student Services also offers psychological counselling for study-related personal difficulties.

(2) [1]Course-related, subject-specific advising is provided by the advisor from the office of the Dean of Studies or by the subject-specific advisors appointed by the Faculty of Physics or by the coordinators of the Max Planck School *Matter to Life*, and by the lecturers. [2]The course-related, subject-specific advice supports students in particular in questions of academic programme design, study techniques and the selection of study focus and in coping with study difficulties.

§ 15 Entry into Force

This regulation enters into force following its promulgation in the official announcements I of Georg-August-Universität Göttingen as per 01/10/2019.

Appendix I Module Overview / Module Directory

Master's degree programme "Matter to Life"

Following the regulations below, at least 120 C must be successfully completed. The Master's degree programme "Matter to Life" comprises the scientific fields of biophysics, the dynamics of complex systems, physical (elementary) chemistry of life and synthetic biology.

A. Block I (Term 1-3)

Modules worth overall at least 90 C must be successfully completed within the following regulations.

a. Elementary subject-matter-oriented modules (Term 1-2)

i. The following subject-matter-oriented modules worth overall 12 C must be successfully completed, provided that these or equivalent modules were not already completed successfully in the course of the Bachelor's degree programme:

M.MtL.1001	Introduction to Biophysics	(6 C / 6 SWS)
M.MtL.1002	Introduction to Physics of Living Complex Systems	(6 C / 6 SWS)

ii. The following subject-matter-oriented modules worth overall 25 C must be successfully completed:

M.MtL.1003	Physical Chemistry of Life	(5 C / 3 SWS)
M.MtL.1004	Bioengineering/Synthetic Biology	(4 C / 2 SWS)
M.MtL.1005	Advanced Complex Systems and Biological Physics	(10 C / 4 SWS)
M.MtL.1006	Modern experimental methods	(6 C / 6 SWS)

b. Advanced subject-matter-oriented modules (Term 2-3)

Depending on whether or not modules under letter a number i had to be completed, a number of modules worth overall at least 34 C or worth overall at least 22 C must be successfully completed; modules that were already successfully completed during the Bachelor's degree programme must not be taken into account:

B.Phy.5405:	Active Matter	(3 C / 2 SWS)
B.Phy.5616	Biophysics of the Cell	(6 C / 4 SWS)
B.Phy.5623	Theoretical Biophysics	(6 C / 4 SWS)
B.Phy.5625	X-Ray Physics	(6 C / 4 SWS)
B.Phy.5663:	Stochastic Dynamics	(6 C / 6 SWS)
B.Phy.5608	Micro- and Nanofluidics	(3 C / 2 SWS)
B.Phy.5613	Soft Matter Physics	(3 C / 2 SWS)
B.Phy.5648	Theoretical and Computational Biophysics	(3 C / 2 SWS)
B.Phy.5649	Biomolecular Physics and Simulation	(3 C / 2 SWS)

B.Phy.5657	Biophysics of Gene Regulation	(3 C / 2 SWS)
B.Phy.5658	Statistical Biophysics	(6 C / 4 SWS)
B.Phy.5660	Theoretical Biofluid Mechanics	(3 C / 2 SWS)
M.Phy.5401	Advanced Statistical Physics	(6 C / 6 SWS)
M.Phy.5610	X-ray Tomography for students of Physics and Mathematics	(3 C / 2 SWS)
M.Phy.1401	Advanced lab course	(6 C / 6 SWS)
M.Phy.1404	Methods of Computational Physics	(6 C / 6 SWS)
M.Phy.1405	Advanced Computational Physics	(6 C / 6 SWS)
M.MtL.1007	Biochemistry and Biophysics	(6 C / 7 SWS)
M.MtL.1406	Research seminar Matter to Life	(4 C / 2 SWS)

c. Practice-oriented modules (Term 3)

The following modules/research internships worth overall 22 C must be successfully completed:

M.MtL.1101	Lab-Rotation 1	(11 C)
M.MtL.1102	Lab-Rotation 2	(11 C)

d. Professional knowledge

The following modules worth overall 9 C must be successfully completed:

M.MtL.1201	Ethics in Synthetic Biology	(3 C / 2 SWS)
M.MtL.1202	Professional Skills in Science	(3 C / 2 SWS)
M.MtL.1203	Seminar: Results of the Research Projects	(3 C / 2 SWS)

B. Block II (Term 4)

Completion of the Master's thesis is worth 30 Credits.

Appendix II Example of Plan for Periods of Studies