Only those regulations published by the Georg-August-Universität Göttingen in its Official Bulletins are legally binding. Any claims to rights or titles resulting from the English translation of these regulations are expressly excluded.

Faculty of Biology and Psychology:

Following the decision of the Faculty Council of the Faculty of Biology and Psychology on 09.03.2022 and 04.05.2022 and following the Senate´s statement of 18.05.2022, the Presidential Board of the University of Göttingen approved the examination and study regulations for the consecutive Master's degree programme "Computational Biology and Bioinformatics" on 25.05.2022 (§ 44 section 1 sentence 2 NHG in the version published on 26.02.2007 (Nds. GVBl. p. 69), last amended by Article 12 of the Act of 14.12.2023 (Nds. GVBl. p. 320); §§ 37 section 1 sentence 3 no. 5 b), 44 section 1 sentence 3 NHG).

Examination and study regulations for the consecutive Master's programme "Computational Biology and Bioinformatics" at the University of Göttingen

§ 1 Scope

(1) The provisions of the "General Examination Regulations for Bachelor's and Master's degree programmes and other courses offered at the University of Göttingen" (APO) apply to the Master's degree programme "Computational Biology and Bioinformatics" in the currently valid version.

(2) These regulations govern the further provisions for the completion of the Master's degree programme "Computational Biology and Bioinformatics".

§ 2 Aims of the programme, purpose of the Master's examination, university degree

(1) [1]The consecutive Master's degree programme "Computational Biology and Bioinformatics" is research-oriented and aims to provide a scientifically sound, fundamental education by deepening specialist knowledge in several research areas at the interface between computer science and biology. [2]It establishes the ability to conduct independent basic or application-orientated research. [3]The programme places particular emphasis on teaching skills in the fields of genomics, transcriptomics, proteomics and metabolomics. [4]A basic understanding of algorithms and the ability to develop software in high-throughput data analysis and in-silico modelling is acquired.

(2) The Master's degree programme in Computational Biology and Bioinformatics is a consecutive degree programme that builds on the foundations taught in a corresponding undergraduate Bachelor's degree programme and deals with interdisciplinary, scientific issues.

(3) [1]The general and subject-related objectives of the programme include the acquisition of

- knowledge in the fields of bioinformatics and systems biology as well as their methods and working methods;
- the ability to manage, structure and make sense of (large) amounts of data
- the ability to understand classical algorithms and statistical methods as well as special bioinformatics approaches and apply them to specific problems
- the ability to implement algorithms in programming language(s)
- the ability to independently solve bioinformatics problems with algorithms
- the ability to collect, visualise and analyse data relevant to bioinformatics, biological and biochemical issues;
- the ability to use and evaluate bioinformatics, biological and biochemical literature and other documentation;
- the ability to present research results in written, oral and graphic form.

[2]Graduates of the Master's degree programme in “Computational Biology and Bioinformatics” have in-depth specialist knowledge in the field of obtaining and using biological data as well as algorithms and data structures for analysing this data. [3]They understand bioinformatics concepts. [4]They are proficient in bioinformatics methods for data analysis and can scientifically describe, analyse and evaluate challenging problems and tasks in this interdisciplinary field. [5]They are able to plan and independently carry out investigations and to scientifically document, interpret and convincingly present the results.

(4) [1]Graduates are qualified for professional activities in research-related fields and are qualified to take up a doctoral project. [2]They are able to contribute scientific knowledge to the formulation and solution of complex problems and tasks in universities and other research institutions as well as in industry, and have experience in communicating their expertise in a multidisciplinary environment. [3]They are able to familiarise themselves with new subject areas. [4]They can apply their knowledge responsibly, taking into account safety, ecological, ethical and economic requirements. [5]They can actively shape the opinion-forming process in society with regard to scientific issues and communicate their own research results and complex issues orally and in writing in English.

(5) The knowledge and skills acquired enable graduates of the degree programme to work in a variety of different professional fields, which can be divided into the following main groups:

- Research institutes involved in high-throughput analyses and/or modelling of biosystems,
- Molecular and biomedically orientated analytics and diagnostics in an industrial environment,
- Bioinformatics departments in the pharmaceutical and life sciences industry,
- providers of bioinformatics system solutions as a service for the pharmaceutical and animal
- pharmaceutical and veterinary pharmaceutical industry,
- specialised agencies for patents and information technology.

(6) [1]In addition to well-founded scientific knowledge, the degree programme imparts interdisciplinary, job-related skills in the subject-specific area of professionalisation. [2]Through an additional broad range of optional university-wide key competencies modules in the areas of methodological, language, personal and social skills, personal development and commitment to civil society tasks are promoted and a successful course of study and career entry are made possible.

(7) The examinations during the Master's degree programme are intended to determine whether the candidates have an overview of the interrelationships of the subject, the ability to apply scientific methods and knowledge and whether they have acquired the in-depth specialist knowledge required for the transition to professional practice or a doctorate.

(8) After passing the Master's examination, the University awards the degree "Master of Science", abbreviated to "M.Sc".

§ 3 Structure of the degree programme

(1) The degree programme begins in the winter semester.

(2) [1]The standard period of study is four semesters. [2]The Master's degree programme is not suitable for part-time study.

(3) The degree programme comprises 120 credits (ECTS credits, abbreviated to C), which are distributed as follows:

a) to the core subject studies 54 C,

b) 36 C in the area of professionalisation, including 12 C in key competencies, and

c) to the Master thesis 30 C.

(4) [1]The module catalogue, which also contains the overview of modules within the meaning of § 4 section 1 sentence 1 APO, is published separately; it is an integral part of these examination and study regulations. [2]A recommendation for the structure of the degree programme can be found in the attached exemplary study plan (appendix).

§ 4 Programme content

(1) [1]The modules of the core subject studies (54 C) together cover the breadth of bioinformatics, biology and core informatics and are geared towards the educational objectives specified in § 2. [2]Depending on prior knowledge, the core subject studies comprises up to 10 C in Computer Science, 12-22 C in Biology and 32 C in Bioinformatics.

(2) [1]The area of professionalisation (36 C) serves to develop students' individual profiles and to acquire key competencies. [2]By choosing a specialisation (12 C), students focus on an area of application. [3]The area of professionalisation also includes modules of at least 12 C from the compulsory elective modules offered on the degree programme. [4]Further compulsory elective modules totalling 12 C serve to acquire key competencies that encourage critical thinking and enable students to act appropriately, responsibly, reflectively and empathetically in order to be able to cope with various academic, professional, personal and social tasks and challenges in a way that is appropriate to the situation and addressees. [5]In this area, modules from the entire programme offered by the Georg-August University can be taken, depending on availability.

(3) [1]If an examination can be taken into account as part of several module examinations, the module examination for which the examination is being taken must be specified when registering for the examination. [2]The same examination cannot be taken into account as part of another module examination.

(4) Modules and examinations that have been completed for the core subject studies cannot be taken into account in the area of professionalisation and vice versa.

§ 5 Admission to courses with a limited number of participants; registration for and cancellation of modules; teaching and examination language

(1) [1]For admission to modules with a limited number of participants, in the event that there are more registrations than places available, registrations shall be considered in accordance with the procedure regulated by the Examination Board. [2]In this case, the available places will be allocated preferentially to students for whom the course is a compulsory or compulsory elective course. [3]Students from other degree programmes for whom it is possible to take the course as part of the area of professionalisation, as well as students who wish to complete the module

as an elective module or voluntary additional examination, will be given lower priority. [4]Within each of these groups, priority is given to students in the immediate vicinity of graduation. [5]The Examination Board may regulate further selection procedures within the groups.

(2) [1]Registration is required for participation in modules with a limited number of participants, which must be completed via the examination administration system within the deadline to be announced in an appropriate manner. [2]Cancellation without a special reason is only possible within the registration period. [3]Registration for a module does not also include binding registration for the corresponding module examination; a separate registration for the module examination is required for this.

(3) [1]The courses and examinations offered on the degree programme are generally taught in English. [2]The module examinations for compulsory elective and elective modules that are exceptionally taught in German are generally also conducted in German; further details are set out in the module description.

§ 6 Student counselling; mentoring model

(1) Subject-specific study counselling shall be provided by the degree programme coordinator and otherwise by the lecturers involved in the degree programme.

(2) [1]Students shall select a mentor from the group of authorised examiners within the degree programme at the latest before registering for the first examination.

[2]This mentor is the contact person for all matters relating to the degree programme (mentoring model). [3]If a student is unable to find a mentor, a mentor will be appointed by the Dean of Studies; students have the right to make suggestions, which does not constitute a legal claim.

§ 7 Examination board

(1) [1]The Examination Board consists of four members, two members of the university lecturers' group, one member of the staff group and one member of the student group, who are nominated by the respective group representatives in the Faculty Council of the Faculty of Biology and Psychology. [2]A deputy shall also be appointed for each member. [3]The members of the university teachers' group and the staff group are to be nominated from the ranks of the departments involved in the degree programme; the status groups can submit proposals for nomination to the Faculty Council in meetings. [4]The term of office of the members is two years, for the member of the student group one year. [5]Reappointment is possible. [6]If a member or deputy resigns prematurely, a replacement shall be appointed for the remaining term of office.

[7]Student members only have an advisory vote in the assessment and crediting of examination results.

(2) The Examination Board elects a chairperson and deputy chairperson from the group of university lecturers.

(3) [1]The implementation and organisation of the examination procedure is delegated to the Examinations Office, without prejudice to the competences of the Dean of Studies. [2]The Examination Office shall also keep the examination files. [3]It reports regularly to the faculty on examinations and study periods. [4]In doing so, it shall report in particular on compliance with the standard periods of study and the distribution of module and overall grades.

(4) Day-to-day business may be delegated to the Chairperson.

§ 8 Examination organisation; implementation of the degree programme

(1) [1]The Faculty Council shall decide on implementation regulations for the organisation of examinations at the suggestion of the Examination Board and these shall be announced by the responsible Examination Office. [2]They shall be made known to the students and examiners concerned in a suitable manner and in good time.

(2) [1]Module examinations for compulsory modules must be offered every semester. [2]Module examinations for compulsory elective modules should be offered every semester.

(3) [1]The result of an examination shall be notified to the responsible examination office by the examiner without delay, but at the latest within three working days of the assessment of the examination; notification shall generally be made by entry in the examination administration system. [2]The assessment must be received no later than two weeks before the next repeat examination so that the student can take part in this without disadvantage in the event of failure.

(4) [1]The departments involved in the degree programme organise the implementation of this degree programme under the responsibility of the Faculty of Biology and Psychology and coordinate the content of the modules; the statutory rights and obligations of the Dean of Studies remain unaffected. [2]They elect a Spokesperson and their deputy to represent the interests of the degree programme. [3]The faculty councils decide on the participation of working groups outside the Faculty of Biology and Psychology in the implementation of this degree programme and the inclusion of modules from other faculties after hearing the university lecturers involved in the degree programme.

§ 9 Module examinations: Form of the examinations

(1) In addition to the examinations permitted under the provisions of the APO, the following subject-specific examinations may be required: Seminar presentation, minutes.

(2) A seminar presentation is given by a participant or a group of participants on a given topic in the form of a short written summary and a lecture or an explanatory presentation to the group of participants of a seminar and is assessed by the examiner leading the seminar.

(3) [1]In a protocol, the candidate should document in writing any independent contributions made during the planning, implementation and evaluation of experiments or projects and present the results in writing in a technically appropriate form. [2]The protocol is assessed by the examiner in charge of the project.

§ 10 Module examinations: Registration and cancellation

(1) [1]Registration for written examinations takes place up to seven days before the examination date. [2]Withdrawal without giving reasons (cancellation) is possible up to 24 hours before the examination date.

(2) [1]Registration for oral examinations takes place up to seven days before the first examination date of the examination period. [2]Cancellation is only possible within the registration period.

(3) [1]Registration for written examinations to be completed without supervision (e.g. assignments, protocols) shall take place up to seven days before the start of the specified processing period. [2]Cancellation is only possible within the registration period.

(4) [1]Registration for subject-specific forms of examination is carried out as specified by the examination board, usually up to seven days before the examination date or the first examination date of the examination period. [2]Cancellation is only possible within the registration period.

(5) Registration and deregistration shall take place exclusively via the examination administration system.

§ 11 Repeatability of examinations

(1) [1]Repeat examinations of compulsory and compulsory elective modules must be taken within a reasonable period of time. [2]They must be taken within two semesters of the unsuccessful examination attempt. [3]If the deadline is exceeded, the resit attempt is deemed to

have been failed. [4]If there are important reasons, the examination board may grant an appropriate extension of the deadline.

(2) [1]A module examination of the core subject studies that has been passed may be repeated once for the purpose of improving the grade in accordance with the following provisions. [2]The repetition is limited to module examinations that are conducted as written examinations. [3]Other forms of examination may only be repeated on application. [4]The resit must take place within 15 months of notification of the first pass and may only be carried out within the standard period of study.

§ 12 Admission to the Master thesis

(1) The prerequisite for admission to the Master thesis is the successful completion of modules of the degree programme totalling at least 78 C, including the module M.CoBi.503 (Advanced course in Computational Biology).

(2) [1]Admission to the Master thesis must be applied for in text form to the responsible examination board. [2]In addition to proof of the prerequisites for admission in accordance with section 1, the following documents must be submitted if they are not stored in the examination administration system:

a) the proposed topic for the Master thesis,

b) a proposal for the first supervisor and the second supervisor,

c) a confirmation from the first supervisor and the second supervisor.

[3]The proposal according to sentence 2 letters a) and b) as well as the proof according to sentence 2 letter c) are not required if the student assures that he or she has not found a supervisor. [4]In this case, the responsible Examination Board shall appoint supervisors and determine the topic of the Master's thesis.

(3) [1]The Examination Board decides on admission. [2]This is to be refused if the admission requirements are not met.

§ 13 Master thesis

(1) The Master thesis should demonstrate that the candidate is able to independently work on a problem from the research area of the Master's degree programme "Computational Biology and Bioinformatics" using scientific methods and to present and interpret scientific results appropriately within a specified period of time.

(2) The topic, task and scope of the Master thesis must be limited in such a way that the deadline for completion can be met.

(3) [1]The candidate must be consulted on the choice of topic. [2]The right to suggest a topic does not constitute a legal claim. [3]The topic of the Master thesis shall be issued by the Examination Board, which shall establish procedural rules for this purpose. [4]The time of issue shall be recorded.

(4) [1]As a rule, the Master thesis is supervised by an authorised examiner from the degree programme. [2]In addition to the authorised examiners appointed by the Faculty Board, the Examination Board may, in individual cases, appoint suitable people within the meaning of § 11 APO as supervisors and examiners for a Master thesis.

(5) [1]The processing time for the Master thesis is 26 weeks. [2]It begins with the issue of the topic by the Examination Board. [3]At the candidate's request, the responsible Examination Board may extend the completion time by a maximum of four weeks if there is an important reason that is not attributable to the candidate. [4]An important reason is usually illness, which must be reported immediately and documented by a medical certificate. [5]If the reason for the extension is related to the topic or the processing procedure, a statement from the first supervisor must be attached to the application in accordance with sentence 3.

(6) [1]The topic may only be returned once and only within the first ten weeks of the processing time. [2]A new topic must be agreed immediately, but at the latest within four weeks. [3]If the Master thesis is repeated, the topic may only be returned if the candidate did not make use of this option in the first examination attempt.

(7) [1]The Master thesis must be written in English. [2]Upon request, the Master thesis may be written in German in deviation from sentence 1; in this case, it must be accompanied by a summary in English. [3]An application in accordance with sentence 2 can only be approved if the intended supervisors have the required command of the examination language.

(8) [1]The Master thesis must be submitted to the responsible examination office on time and exclusively in PDF/A format in accordance with ISO 19005-1:2005; data supplementing the Master's thesis (e.g. programme code, measured values) must be submitted as a compressed file in ZIP format. [2]The submission is usually made by uploading to the examination administration system. [3]The time of submission must be recorded. [4]When submitting the Master thesis, the candidate must confirm in writing that he or she has written the thesis independently and has not used any sources or aids other than those specified.

(9) [1]The Examination Office shall forward the Master thesis to the first supervisor and the second supervisor as assessors. [2]Each assessor shall award a grade.

(10) The assessment procedure must be completed within six weeks.

§ 14 Assessment of the Master thesis

[1]The grade of the Master thesis is calculated as the arithmetic mean of the two assessors' grades. [2]If the difference is at least 1.1 or if one assessment is "insufficient" but the other is "sufficient" or better, the responsible examination board will appoint a third assessor to assess the Master thesis. [3]The third assessor may decide in favour of one of the previous assessments or an assessment in between.

§ 15 Overall result, final failure and distinction

(1) The Master's examination is passed if at least 120 C have been earned and all required module examinations and the Master thesis have been passed.

(2) [1]In addition to the cases specified in the APO, the right to take examinations is definitively cancelled if

a) at least 15 C have not been acquired by the end of the 2nd semester or
b) at least 60 C have not been acquired by the end of the 4th semester or
c) not all credits required to pass the Master's examination have been earned by the end of the 8th semester.

[2]In this case, the Master's examination is deemed to have been definitively failed. [3]Exceeding the deadlines specified in sentence 1 is permitted if the student is not responsible for exceeding the deadline. [4]The Examination Board shall decide on this at the student's request.

(3) When calculating the overall result of the Master's examination, the assessments of the modules in the key competencies area are not taken into account by converting graded module examinations into ungraded module examinations.

(4) The overall result "with distinction" is awarded if the Master thesis was graded with 1.0 and the average grade of the other examinations is at least 1.2.

§ 16 Entry into force

These regulations shall enter into force on 01.10.2022 following their publication in the Official Announcements of the University of Göttingen.

Appendix Exemplary study plans

a. Undergraduate pre-study programme with a Bachelor's degree in the field of Biology

Sem. Σ C	Cores Subject Studies Bridge modules (10 C)	Bioinformatics (32 C)	Biology (12 C)	Area of Professionalisation **incl. key competencies** (36 C)	
1. Σ 30 C	Biology for bioinformaticians; M.CoBi.*502 (10 C)*	*Bioinformatics and its areas of application;* *M.CoBi.*501 (8 C)	Molecular genetics and microbial cell biology; M.Bio.172 (6 C)	Deep Learning; B.*Inf.1237 (6C)*	
2. Σ30 C		M.Inf.*1504: Algorithms in bioinformatics II (6 C)** *M.Inf.1501: Data Mining in bioinformatics (6 C)**	Structural Biochemistry; *M.Bio.176 (6C)*	Generalized Regression; *M.WIWI-QMW.0001 (6C)*	Academic writing and presentation in the natural sciences;; ***SK.IKG-ISZ.49 (6C)***
3. Σ 30 C		M.Bio.323: Introduction to *Bayesian Inference and Information Theory* (12C)		Advanced course in Computational Biology*; M.CoBi.503 (12 C)*	Working in Intercultural Teams; SK.*IKG-IKK.08 (3 C)* Protein analytics using mass spectrometry; *SK.Bio.7009 (3 C)*
4. **Σ 30 C**		Master thesis 30 C			

b. undergraduate degree with a Bachelor's degree in the field of computer science

Sem. Σ C	Core Subject Studies Bridge modules (10 C)	Bioinformatics (32 C)	Biology (12 C)	Area of professionalisation incl. key competencies (36 C)	
1. Σ 30 C	Biology for bioinformaticians; *M.CoBi.502 (10 C)*	Bioinformatics and its areas of application; *M.CoBi.501* (8 C)	Molecular genetics and microbial cell biology; M.Bio.172 (6 C)	Deep Learning; *B.Inf.1237 (6C)*	
2. Σ30 C		M.Inf.1504*: Algorithms in bioinformatics II (6 C)** M.Inf.1501: *Data Mining in bioinformatics* (6 C)*	Structural Biochemistry; *M.Bio.176 (6C)*	Generalized Regression; *M.WIWI-QMW.0001 (6C)*	Academic writing and presentation in the natural sciences ; *SK.IKG-ISZ.49 (6C)*
3. Σ 30 C		M.Bio.323: Introduction to Bayesian Inference and Information Theory (12C)		Advanced course in Computational Biology; *M.CoBi.503 (12 C)*	Working in Intercultural Teams; *SK.IKG-IKK.08 (3 C)* Protein analytics using mass spectrometry; SK.*Bio.7009 (3 C)*
4. **Σ 30 C**		Master thesis 30 C			