June 2025

Courses in English for Incoming Bachelor and Master students

The following courses are open for incoming exchange students of the Faculty of Biology. They are given in English; a language proof is not required.

You can select the courses as Bachelor or Master student if you meet subject specific requirements indicated under 'remarks'.

Information to the modules (content, workload, prerequisites etc.) can be found in the module catalogue below. Inform yourself carefully before choosing a module.

In addition, check the semester dates using our Course Catalogue “EXA” whilst choosing a module in order to avoid overlap of lectures and courses. Our "Guide for exchange students" contains information on using EXA. In case the semester dates are not available yet, simply contact us.

University Course Catalouge (EXA)

Guide for exchange students of biology

Courses available in winter term				
Acronyms for course type: L = lecture, P = practical course, T = tutorial, S = seminar				
Module-No.	Title	ECTS	Type	Remarks
SK.Bio.305	Biostatistics with R	3	T	as block course in March, basic statistical knowledge recommended
SK.Bio.307	Linux and Python for biologists	4	P	Block course in March
SK.Bio.329	Research internship (4 weeks)	6	P	Individual Lab Project*
SK.Bio.331	Research internship (8 weeks)	12	P	Individual Lab Project*
SK.Bio.370	Molecular zoology: Topics and methods	6	L, S, P	
SK.Bio.7002	Basic virology	3	L	
SK.Bio.7004	Environmental microbiology	3	L, P	requires knowledge in microbiology
SK.Bio.7007	Methods in Molecular Virology	3	S	requires basic knowledge in virology
SK.Bio.7008	Molecular basis of HIV replication and pathogenesis	3	L	
SK.Bio.7009	Learning with a core facility - protein analytics using mass spectrometry	3		Block course in September

Courses available in summer term				
Acronyms for course type: L = lecture, P = practical course, T = tutorial, S = seminar				
Module-No.	Title	ECTS	Type	Remarks
SK.Bio.305	Biostatistics with R	3	T	
SK.Bio.329	Research internship (4 weeks)	6	P	Individual Lab Project*
SK.Bio.331	Research internship (8 weeks)	12	P	Individual Lab Project*
SK.Bio.7001	Neurobiology I	6	L, S	
SK.Bio-NF.7001	Neurobiology I	3	L	
SK.Bio.7002	Basic virology	3	L	

SK.Bio.7007	Methods in Molecular Virology	3	S	requires basic knowledge in virology
SK.Bio.7008	Molecular basis of HIV replication and pathogenesis	3	L	

* Individual Lab project: requires a self-organised supervising working group. More Information in the *Guide for exchange students of biology* under “2.3.2 Laboratory Project”.

Georg-August-Universität
Göttingen

Directory of Modules

Courses for Incomings

Index by areas of study

I. Courses for Incomings - Additional courses in English

SK.Bio-NF.7001: Neurobiology (3 C, 2 SWS)....4
SK.Bio.305: Biostatistics with R (3 C, 2 SWS)....6
SK.Bio.307: Linux and Python for biologists (4 C, 3 SWS)....7
SK.Bio.329: Research internship (4 weeks) (6 C, SWS)....8
SK.Bio.331: Research internship (8 weeks) (12 C, SWS)....9
SK.Bio.370: Molecular zoology: Topics and methods (6 C, 8 SWS)....10
SK.Bio.7001: Neurobiology (6 C, 4 SWS)....12
SK.Bio.7002: Basic virology (3 C, 2 SWS)....14
SK.Bio.7004: Environmental microbiology (3 C, 2 SWS)....15
SK.Bio.7006: Microbiology of marine and terrestrial habitats (6 C, 6 SWS)....16
SK.Bio.7007: Methods in molecular virology (3 C, 2 SWS)....17
SK.Bio.7008: Molecular biology of HIV replication and pathogenesis (2 C, 1 SWS)....18
SK.Bio.7009: Learning with a core facility - protein analytics using mass spectrometry (3 C, 3 SWS)....19

Georg-August-Universität Göttingen **Module SK.Bio-NF.7001: Neurobiology**	3 C 2 WLH

Learning outcome, core skills: The students should acquire comprehension in form and function of neurons and their anatomical and physiological features (genetics, subcellular organization, resting membrane potential, action potential generation, stimulus conduction, transmitter release, ion channels, receptors, second messenger cascades, axonal transport). The students acquire knowledge of the physiological basics of sensory systems (olfactory, gustatory, acoustic, mechanosensory and visual perception) as well as motor control. Based on this the students educe understanding for the relation between neuronal circuits and simple modes of behavior (central pattern generators, reflexes, and taxis movements). The students should conceptually learn how neuronal connections are modified by experience (cellular mechanisms of learning and memory) and should learn different types of modification of behavior based on experience and neuronal substrates. The students should acquire fundamental insight into the organization and function of brains and autonomous nervous systems of mammals and invertebrates. The neurobiological basis of behavioral control (orientation, communication, circadian rhythm and sleep as well as motivation and metabolism) is explained. The students will learn physiological and cellular mechanisms of aging and of neurodegenerative diseases.	**Workload:** Attendance time: 30 h Self-study time: 60 h

Course: Neurobiology (Lecture)	2 WLH
Examination: Written examination (90 minutes)	3 C

Examination requirements: The students should have the ability to assess coherence and facts of statements from the field of neurobiology; they should be able to answer questions on the structure and function of neurons and neuronal circuits. Furthermore they should be able to describe and compare neuronal basics of behavioral control, their experience-dependent modification and conceptual mechanisms of complex behavior; they should be able to describe and compare physiological mechanisms of sensory perception and different sensory modalities; they should be able to describe physiological and cellular mechanisms of aging and of neurodegenerative diseases.	

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: English	**Person responsible for module:** Prof. Dr. Andrè Fiala
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 30	

Additional notes and regulations:
The combination of this module with module SK.Bio.7001 is not possible.

Georg-August-Universität Göttingen **Module SK.Bio.305: Biostatistics with R**	3 C 2 WLH

Learning outcome, core skills: After successful completion of the module, the students are able to deal with the open statistics programming language R and to apply this language to biological data. They gained the ability to apply statistical methods like descriptive statistics, parametric and non-parametric two-random-sample tests, Chi-Quadrat test, correlation analysis, linear regression analysis and ANOVA.	**Workload:** Attendance time: 30 h Self-study time: 60 h

Course: Einführung in die Biostatistik mit R (Seminar)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** continuous participation in the course; solved exercises **Examination requirements:** Independent analysis of biological data with the help of the programming language R; evaluation and practical application of basic statistical testing methods.	3 C

Admission requirements: none	**Recommended previous knowledge:** basic knowledge in mathematics and statistics
Language: German	**Person responsible for module:** Prof. Dr. Tim Beißbarth
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 23	

Georg-August-Universität Göttingen **Module SK.Bio.307: Linux and Python for biologists**	4 C 3 WLH

Learning outcome, core skills: After successfully completing the module, students have basic knowledge of the Linux operating system and basic programming skills in Python or comparable languages.	**Workload:** Attendance time: 56 h Self-study time: 64 h

Course: Linux and Python for biologists (Internship) The course will take place online. *Course frequency:* Block course during the lecture free time	3 WLH
Examination: Practical examinationmit Vortrag (20 minutes), not graded **Examination requirements:** Independent work with the command line interpreter under the Linux operating system; creation of small programmes in the Python programming language (reading data from files, creating suitable data structures, dealing with regular expressions, implementation of simple algorithms).	4 C

Admission requirements: none	**Recommended previous knowledge:** B.Bio.113
Language: German, English	**Person responsible for module:** Dr. Sophie de Vries
Course frequency: each winter semester; during the lecture free time	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 30	

Additional notes and regulations:
The module cannot be taken in combination with B.Bio.117.

Georg-August-Universität Göttingen **Module SK.Bio.329: Research internship (4 weeks)**	6 C

Learning outcome, core skills: After successful completion of the module, the student can... • demonstrate in-depth knowledge of current topics and research focuses in biology at an institution (MPI, institute abroad, etc.) with special consideration of modern methods • carry out the work carried out independently in connection with current research projects • document and record experiments and theoretical work related to current research projects in accordance with the usual standards.	**Workload:** Attendance time: 160 h Self-study time: 20 h

Course: Research internship	

Examination: Results report in the form of a scientific article (max. 5 pages), not graded **Examination prerequisites:** Successful participation in an internship of at least 4 weeks (160 hours), presentation at the host institution (according to local practice, but at least 20 minutes).	6 C

Examination requirements: Competent presentation of the research approach, the state of research, the methodology used and the results, discussion skills and critical thinking beyond one's own field of work	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Dean of studies
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module SK.Bio.331: Research internship (8 weeks)**	12 C

Learning outcome, core skills: After successful completion of the module, the student can... • demonstrate in-depth knowledge of current topics and research focuses in biology at an institution (MPI, institute abroad, etc.) with special consideration of modern methods • carry out the work carried out independently in connection with current research projects • document and record experiments and theoretical work related to current research projects in accordance with the usual standards.	**Workload:** Attendance time: 320 h Self-study time: 40 h

Course: Research internship (8 weeks / 320 hours)	
Examination: Results report in the form of a scientific article (max. 5 pages), not graded **Examination prerequisites:** Successful participation in an internship of at least 8 weeks (320 hours), presentation at the host institution (according to local practice, but at least 20 minutes).	12 C

Examination requirements: Competent presentation of the research approach, the state of research, the methodology used and the results, discussion skills and critical thinking beyond one's own field of work	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Studiendekanin / Studiendekan
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module SK.Bio.370: Molecular zoology: Topics and methods**	6 C 8 WLH

Learning outcome, core skills: Molecular methods have become indispensable in zoology. This module addresses students who want to learn experimental approaches to molecular genetic investigations and to acquire the relevant skills for practical laboratory work. Additionally, it provides an overview of various current issues of molecular zoology and the application of molecular methods in insect pest control and insect biotechnology. Learning outcome: • basic knowledge of molecular work and different experimental approaches (i.a. DNA work, cloning, sequencing, sequence analysis). • basics of gene function in animals • methods of gene function analysis (i.a. genetic screens, reverse genetics (RNAi), genome editing (CRISPR / Cas9), transgenesis) • advantages and disadvantages of different molecular model systems • overview of current research topics of molecular zoology (i.a. evolution and development (“EvoDevo”), “EcoDevo”, sex determination, molecular communication, chronobiology) • molecular methods in insect biotechnology • After completing the module, the students should be able to: • design and perform molecular biological experiments (i.a. DNA extraction, plasmid preparation, PCR, restriction digestion, cloning). • handle databases with information on gene structure and gene function. • choose appropriate model systems and methods for certain zoological questions and develop experimental strategies.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Gene function analysis in diverse animals and applications in pest control (Lecture)	1 WLH
Course: Current research in molecular zoology and biotechnology (Seminar)	1 WLH
Course: Introduction to molecular work and methods for gene function studies (Exercise)	6 WLH
Examination: Lecture (approx. 30 minutes) **Examination prerequisites:** regular participation in the practical course **Examination requirements:** Understanding and scientific presentation of topics of molecular zoology in a talk (20 minutes) followed by a discussion (about 10 minutes).	6 C

Admission requirements: B.Bio.102, B.Bio.105, B.Bio.106	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Gregor Bucher
Course frequency:	**Duration:**

each summer semester3 weeks block course	1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 5	

Additional notes and regulations:

The combination of this module with module B.Biodiv.370 or M.Biodiv.446 is not possible.

The module takes place as a three-week block course.

Georg-August-Universität Göttingen **Module SK.Bio.7001: Neurobiology**	6 C 4 WLH

Learning outcome, core skills: The students should acquire comprehension in form and function of neurons and their anatomical and physiological features (genetics, subcellular organization, resting membrane potential, action potential generation, stimulus conduction, transmitter release, ion channels, receptors, second messenger cascades, axonal transport). The students acquire knowledge of the physiological basics of sensory systems (olfactory, gustatory, acoustic, mechanosensory and visual perception) as well as motor control. Based on this the students educe understanding for the relation between neuronal circuits and simple modes of behavior (central pattern generators, reflexes, and taxis movements). The students should conceptually learn how neuronal connections are modified by experience (cellular mechanisms of learning and memory) and should learn different types of modification of behavior based on experience and neuronal substrates. The students should acquire fundamental insight into the organization and function of brains and autonomous nervous systems of mammals and invertebrates. The neurobiological basis of behavioral control (orientation, communication, circadian rhythm and sleep as well as motivation and metabolism) is explained. The students will learn physiological and cellular mechanisms of aging and of neurodegenerative diseases.	**Workload:** Attendance time: 30 h Self-study time: 150 h

Course: Neurobiology (Lecture)	2 WLH
Course: Neurobiology (Seminar)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** regular seminar participation and oral presentation (not graded)	6 C

Examination requirements: The students should have the ability to assess coherence and facts of statements from the field of neurobiology; they should be able to answer questions on the structure and function of neurons and neuronal circuits. Furthermore they should be able to describe and compare neuronal basics of behavioral control, their experience-dependent modification and conceptual mechanisms of complex behavior; they should be able to describe and compare physiological mechanisms of sensory perception and different sensory modalities; they should be able to describe physiological and cellular mechanisms of aging and of neurodegenerative diseases.	

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: English	**Person responsible for module:** Prof. Dr. Andrè Fiala
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6

Maximum number of students: 30	

Georg-August-Universität Göttingen **Module SK.Bio.7002: Basic virology**	3 C 2 WLH

Learning outcome, core skills: The students will become familiar with the architecture of viruses and will learn how these agents replicate and evade the immune response of the host. Moreover, it will be discussed how viruses cause disease and how this process can be prevented by antivirals and vaccines. The lectures will focus on important human pathogens, including HIV, influenza and herpesviruses. Upon successful completion of the module, the students will be able to classify viruses and will have an understanding of central mechanisms underlying virus replication and pathogenesis and their inhibition by therapy and vaccination.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Basic Virology (Lecture)	2 WLH
Examination: Written examination (45 minutes)	3 C

Examination requirements: The students must assess whether statements regarding basic aspects of virology, including virus classification, viral replication, virus-host interactions, pathogenesis, immune evasion and antiviral therapy and vacciantion, are correct.	

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: English	**Person responsible for module:** Prof. Dr. Stefan Pöhlmann
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 6
Maximum number of students: 100	

Georg-August-Universität Göttingen **Module SK.Bio.7004: Environmental microbiology**	3 C 2 WLH

Learning outcome, core skills: The students will acquire a comprehensive understanding of basic microbial processes in the environment. Students will learn how microorganisms are effective in biogeochemical cycles and how these cycles evolved in Earth's history and shaped our biosphere. They will gain knowledge about important microbial habitats (terrestrial/ aquatic/extreme), and their microbial diversity. They will be introduced in the application of microorganisms in bioremediation and environmental biotechnology.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Environmental microbiology (Lecture)	2 WLH
Examination: Oral Presentation (approx. 5 minutes)	3 C

Examination requirements: Revising a specific topic in environmental microbiology, compilation of data and preparation/short presentation of a scientific poster.	

Admission requirements: B.Bio.118	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Rolf Daniel PD Dr. Michael Hoppert
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module SK.Bio.7006: Microbiology of marine and terrestrial habitats**	6 C 6 WLH

Learning outcome, core skills: The students will experience microbial life in extreme environments. Destinations for this excursion will be deep biosphere habitants, hydrothermal springs and marine environments, influenced by rapidly changing salinity (Northern Apennines, Tuscany, Giglio Island). Environmental parameters will be recorded on site, microbial diversity will be estimated and samples for analysis of environmental DNA will be taken and prepared in the field. The aim is the evaluation of microbial diversity and correlation with environmental parameters in a specific site. Students will learn methods for field studies and basic techniques in environmental microbiology. They will gain knowledge in microbial diversity in a specific habitat and in adaptations of microbes in extreme environments.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Preparatory seminar	1 WLH
Course: Microbiology of marine and terrestrial habitats (Excursion) *Course frequency:* block (2 weeks) each summer semester	5 WLH
Examination: written report (max. 20 pages) **Examination prerequisites:** seminar talk, reviewing a focused topic in environmental microbiology related to the excursion, 20 minutes	6 C

Examination requirements: Knowledge on • field work and data processing related to environmental microbiology (sampling, assessment of environmental parameters, sample preparation for diversity analysis) • biotic and abiotic factors shaping a specific habitat • key microbial communities in various environments	

Admission requirements: B.Bio.118, SK.Bio.7004 no requirements needed for students of the MSc MB programme	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Rolf Daniel PD. Dr. Michael Hoppert
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module SK.Bio.7007: Methods in molecular virology**	3 C 2 WLH

Learning outcome, core skills: The students are introduced to the repertoire of methods used in virological research and diagnostics. The course focuses on current developments and seminal experiments from the past. The students will train their ability to extract scientific methods from the literature by themselves and to devise their own strategies to tackle a scientific problem. Students are encouraged to develop their own strategies to solve a specific problem and to discuss their strategies with their fellow students. The students are encouraged to come up with alternative approaches. The students' solutions are compared to published techniques, which are presented in the form of a short talk by a student or the teacher.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Methods in molecular virology (Seminar)	2 WLH
Examination: Lecture (approx. 30 minutes), not graded **Examination prerequisites:** Regular participation in the seminar	3 C

Examination requirements: Understanding and scientific presentation of methods in molecular virology in a seminar talk (approx. 20 minutes) with subsequent discussion (approx. 10 minutes).	

Admission requirements: none	**Recommended previous knowledge:** basic knowledge in virology (e.g. SK.Bio.7002), basic knowledge in molecular biology
Language: English	**Person responsible for module:** Dr. Alexander Hahn
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module SK.Bio.7008: Molecular biology of HIV replication and pathogenesis**	2 C 1 WLH

Learning outcome, core skills: The students will learn the molecular mechanisms underlying the different steps of HIV replication, including entry, reverse transcription, genome integration, gene expression, assembly, release and maturation. Moreover, innate antiviral defenses and viral countermeasures will be discussed. In addition, insights into humoral immune responses against HIV and challenges associated with the generation of an effective vaccine will be provided. Finally, concepts and components of antiretroviral therapy will be introduced and the zoonotic origin of HIV will be discussed. Students attending the lectures will acquire an understanding of central mechanisms underlying HIV replication and pathogenesis and their blockade by immune responses and antiviral therapy.	**Workload:** Attendance time: 14 h Self-study time: 46 h

Course: Molecular biology of HIV replication and pathogenesis (Lecture)	1 WLH
Examination: Written examination (45 minutes)	2 C

Examination requirements: The students should be able to respond to questions concerning basic aspects of HIV replication, pathogenesis, immune responses and antiviral therapy.	

Admission requirements: none	**Recommended previous knowledge:** SK.Bio.7002
Language: English	**Person responsible for module:** Prof. Dr. Stefan Pöhlmann
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module SK.Bio.7009: Learning with a core facility - protein analytics using mass spectrometry**	3 C 3 WLH

Learning outcome, core skills: In the first part of the course, the students get an introduction to the analysis of proteins using liquid chromatography-coupled mass spectrometry (LCMS), and they will prepare peptide samples themselves for this analysis technique in a practical part. Protein samples derive from current projects of different research groups at the Göttingen Campus. In the second part, the students will learn how to analyze the LCMS raw data for identification and relative quantification of proteins. Approaches for the statistical validation of the results will be introduced. The students will get the opportunity to analyze data on their own with state-of-the-art software tools. They will present their results of their project to their fellow students in a concluding seminar at the end of the course.	**Workload:** Attendance time: 40 h Self-study time: 50 h

Course: Protein analytics using mass spectrometry (Course) Practical course and data analysis software training are supervised by members of two core facilities – LCMS Protein Analytics and Medical Biometry and Statistical Bioinformatics	3 WLH
Examination: Oral Presentation (approx. 15 minutes), not graded **Examination prerequisites:** Regular participation in the practical course	3 C

Examination requirements: The students should present the results of their experiment in English.	

Admission requirements: none	**Recommended previous knowledge:** B.Bio.129 or B.Bio.118 or B.Bio.112 or equivalent Practical experience with protein techniques (e.g. SDS-PAGE)
Language: English	**Person responsible for module:** Dr. Oliver Valerius
Course frequency: winter or summer semester, on demand	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 20	