

STUDY GUIDE

MASTER'S DEGREE PROGRAMMES

Biology

with specialization **Behaviour and Neurosciences**

Ecology and Evolution

with Top programme / Erasmus Mundus programme **Evolutionary Biology**

Marine Biology

Molecular Biology and Biotechnology

with Top programme **Biomolecular Sciences**

2010/2011

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Editors: M. van Rijssel and M.H.K. Linskens
Lay-out: Dick Visser
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1 General information

1.1 Introduction

This study guide contains information for all students within the degree Master's degree programmes Biology (with specialization Behaviour & Neurosciences), Ecology & Evolution (with Top programme Evolutionary Biology), Marine Biology and Molecular Biology & Biotechnology(with Top programme Biomolecular Sciences). In principle this guide contains information about the programmes, rules, facility addresses, etc. of importance to students following a Master's programme in the year 2010-2011.

Data liable to change during the year, such as lecture and examination schedules, and daily information about degree programmes can be found in the 'organization *Master's programmes in Biology*' section in Nestor (see section 2.3.3). The guidelines in this guide may not cover specific student needs in exceptional circumstances. In that case, students should contact the study advisor or degree programme coordinator.

1.2 The degree programmes in brief

The goal of the degree programmes is to prepare students for careers in scientific research or for careers in profit or non-profit organizations in the specific domains of the individual degree programmes. To realise these goals the degree programmes contain both theoretical and practical modules, and a substantial part of the two years is reserved for research. Various research groups of the School of Life Sciences, the School of Natural Sciences and Technology, the University Medical Center Groningen (UMCG) and associated institutes are involved in the degree programmes. Students can focus on fundamental or applied research, or a combination of the two.

The duration of the curriculum is 120 ECTS credit points (ECTS: European Credit Transfer and Accumulation System; 1 ECTS = 28 hours of study). The two-year degree programme can either be totally devoted to research (P profile) or be orientated towards management and policy along with research (M profile). The language of instruction is Dutch for a number of modules in the latter specialization.

A study programme is tailored to and depends on the interests of each student, his or her background and the skills and knowledge necessary to participate in a given research area. A study programme is designed in close cooperation with a so-called mentor. The Board of Examiners has to approve each individual study programme. The structure of the study programme is described in Chapters 4-7.

The learning outcomes of the master's degree programme are as follows:

Learning Outcome for knowledge and insight.

A master graduate in:

- Biology has detailed knowledge of one or more of the scientific disciplines within the area of biology;
- Ecology & Evolution has detailed knowledge of one or more of the scientific disciplines within the area of Ecology & Evolution with emphasis on evolutionary ecology & genetics, behavioural ecology & ecophysiology, conservation biology, or community ecology;
- Marine Biology has detailed knowledge of one or more of the scientific disciplines within the area of marine biology with emphasis on biological oceanography or coastal marine ecology;

- Molecular biology & Biotechnology has detailed knowledge of one or more of the scientific disciplines within the area of of biomolecular sciences, with emphasis on structural biology, biochemistry, molecular and cellular biology, microbiology, biotechnology or bioinformatics;

Learning Outcomes for academic skills and attitudes.

The graduate:

- is capable of designing and conducting scientific research;
- is capable of independently investigating, and critically evaluating, scientific literature;
- is capable of identifying new developments in the relevant disciplines, and to become familiar with these developments;
- is organised and creative in the approach to scientific research and complex problems;
- can participate in, and contribute to, an interdisciplinary team;
- can effectively communicate acquired knowledge, insights and skills to others, both in writing and in oral presentation;
- is aware of the potential societal and ethical implications of scientific research, and is able to critically reflect on his/her actions in this context;
- is prepared for a professional career in science; or (M-profile) is prepared for a professional career in management & policy.

The Top programmes in Evolutionary Biology and Biomolecular Sciences do adhere to the same learning outcomes but students follow a programme that is challenging both in content and time constrains.

1.3 How the degree programmes fit in the Faculty

The Master's degree programmes are part of the Faculty of Mathematics and Natural Sciences (FWN). FWN is one of the largest natural sciences faculties in the Netherlands. The Faculty is divided into schools, research institutes and a graduate school. In general the research institutes are responsible for research, while the schools organize the teaching programmes. A graduate school combines research with the teaching of Master's and PhD students. The Faculty is managed by a Faculty Board [faculteitsbestuur], which is supported by a Faculty Committee. This committee steers educational matters relevant to all departments, and is also advised by a Faculty Council, comprising staff and students.

FWN has three teaching schools:

- School of Life Sciences
- School of Natural Sciences and Technology
- School of Computing and Cognition

The Master's degree programmes in Biology, Ecology & Evolution, Marine Biology and Molecular Biology & Biotechnology are coordinated by the School of Life sciences. Prof. dr. J.P. Franke is the Director of Studies of the School.

1.3.1 The School of Life Sciences

The School of Life Sciences consists of three teaching departments: biology, pharmacy, and biomedical sciences & technology. The degree programme staff of the School are drawn from a variety of disciplines from the Faculty of Mathematics and Natural Sciences – biology, chemistry, mathematics, pharmacy and physics – and also from the Faculty of Medical Sciences. The School is responsible for the coordination of several Bachelor's and Master's degree programmes:

BACHELOR'S DEGREE PROGRAMMES: Biology Life Science & Technology Pharmaceutical Sciences Pharmacy	MASTER'S DEGREE PROGRAMMES: Behavioural & cognitive neurosciences Biology Biomedical sciences Biomedical engineering Ecology & evolution Marine biology Medical pharmaceutical sciences Molecular biology and biotechnology Pharmacy
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The board of the School of Life Sciences is responsible for the content and quality of the study programmes. It is assisted by an advisory organ, the Course Committee, and by staff responsible for its day-to-day procedures. A number of useful contact persons among the staff are listed below.

EDUCATION OFFICE	E-MAIL	TEL. (050)	ROOMNR. CvL*
<i>Student administration office, registration of results, exams</i>			
VISITING HOURS: 10:30-14:00			
G.M.C. Hoekzema	G.M.C.Hoekzema@rug.nl	3632017	5173.0061
J.J.N. Leppink	Bos-lw@rug.nl	3632210	5173.0065
G.M.L. Bonninga-Caron	Bos-lw@rug.nl	3632210	5173.0061
N. Snijders Vroegop-Rieks	Bos-lw@rug.nl	3632210	5173.0051
<i>Study advisor</i>			
Drs. A.F. Bos	attie.bos@rug.nl	3638764	5173.0053
<i>Degree programme coordinator</i>			
Dr. M. van Rijssel	m.van.rijssel@rug.nl	3632212	5173.0045
* POSTAL ADDRESS CENTRE FOR LIFE SCIENCES, NIJENBORGH 7, 9747 AG GRONINGEN			

The core business of the Education Office is to support the teaching process within the degree programmes. This involves:

- providing information for students and prospective students about the teaching programme
- helping students with study-related problems
- organizing registrations for modules and examinations
- administering examination results
- compiling lecture and examination timetables
- providing information about and organizing periods of study abroad
- formulating and implementing education policy

1.3.2 Course committee

The Course Committee [opleidingscommissie] handles all important matters regarding a degree programme, with the exception of individual problems. This committee directly advises the Faculty Council [faculteitsraad] with regard to the content of the Teaching and Examination Regulations [onderwijs- en examen-regeling; OER]. An additional task of the Committee is the evaluation of modules and the organization of degree programmes. It also advises the director of studies, whether requested or not.

The Course committee consists of six staff members and six students.

The advisory member is the degree programme coordinator Dr. M. van Rijssel.

1.3.3 Board of Examiners

All matters concerning examinations and graduation are dealt with by the Board of Examiners [examencommissie]. Officially, all members of the academic staff sit on this committee. A delegation of staff handles the daily affairs of the Board. Rules and Regulations [Regels en Richtlijnen] is one item within their remit. It handles all individual student requests. In addition, the Board has to authorize on each individual study programme proposal submitted by the students. All requests and study proposals for the Board should be submitted to the secretary of the Board, Dr. M. van Rijssel. The chairman of the Board of Examiners is Prof. A.J.W. Scheurink, Prof. J.T.M. Elzenga, Prof. A.G.J. Buma and Dr. T.R. Koiter are members of the Executive Committee of the Board of Examiners. The Admission board responsible for the selection of applicants is chaired by Prof. J.T.M. Elzenga, Prof A.G.J. Buma, Prof. A.J.W. Scheurink, Prof are members, Dr. ing E. G Vrieling and Dr. M. van Rijssel are advisors of the Admission Board.

1.4 Student's association GLV IDUN

GLV IDUN is the association for all students at the School of Life Sciences of the University of Groningen. GLV IDUN was founded in 2006 by students of the School of Life Sciences.

Membership: open to all students of the School of Life Sciences, approx. € 20,- per year

E-mail address: bestuur@glv-idun.nl

Telephone: 050 3632074 or 8716

One of the duties of GLV IDUN is the sale of textbooks. Members get a sixteen percent discount on their books. In addition to the sale of textbooks, GLV IDUN organizes other study-related events: an annual conference and visits to companies during the academic year.

Less serious activities provided by the GLV IDUN include drinks, parties and some more athletic activities. The website www.glv-idun.nl provides all the information about activities and events you will need.

1.5 Safety and (house) regulations

1.5.1 Buildings

The teaching and teaching support facilities of the School of Life Sciences are accommodated in a number of buildings;

- CvL (buildings 5171-5174); Centre for Life Sciences, Nijenborgh 7, 9747 AG Groningen
- BC (buildings 6511-6523): Biological Center, Kerklaan 30, P.O. Box 14, 9750 AA Haren; tel. reception: (050 363) 2021
- ADL1 (buildings 3211-3217/3219): Medical Sciences, Dentistry and Pharmacy, Antonius Deusinglaan 1, P.O. Box 196, 9713 AV Groningen; tel. reception 050 3638000
- ADL2 (building 3111): Antonius Deusinglaan 2, 9713 AW Groningen; tel. reception (050 363) 3270, bgg 050 3638000
- CFM (buildings 5111-5121, 5151): Chemie-Fysica-Milieukunde, Nijenborgh 4, 9747 AG Groningen; tel. reception (050 363) 4133.
- Bernoulliborg (building 5161) Nijenborgh 9, 9747 AG Groningen; tel. reception (050 363) 6868

For detailed plans of these buildings, see the end of this study guide.

1.5.2 House rules, regulations

Staff, students, visiting researchers and visitors are required to obey the facility house rules.

The Centre for Life Sciences and the Biological Centre are open from Monday to Friday between 8 a.m. and 6 p.m.

The ADL1 buildings are open Monday to Friday from 8 a.m. to 9 p.m. ADL2 closes at 5.30 p.m.

- Smoking ban. In accordance with Dutch law there is a general ban on smoking in public buildings.
- Mobile phones are not allowed in teaching rooms, libraries, laboratories and rooms with computer facilities.
- It is absolutely forbidden to eat or drink in the laboratories, teaching rooms, libraries and rooms with computer facilities.
- Bikes must be stored in the bicycle racks.
- The university accepts no liability for theft or lost property.

You will find an overview of the rules on safety and the environment, and the so-called house rules at the faculty website:

www.rug.nl/fwn/faculteit/diensten/arbomilieu/.

You will be expected to have read these rules, particularly those concerning important matters such as the location of emergency exits, evacuation procedures and the location of the fire extinguishers. The rules on safety and care for the environment must be observed and complied with.

It is absolutely forbidden

- To eat or drink in the laboratories
- To drink from laboratory glasswork
- To store food in laboratory fridges
- To prepare food in laboratory ovens

Before you start working in a laboratory

- Take note of the safety regulations
- Locate the emergency exits and where the escape routes lie
- Locate the fire extinguishers, absorption equipment for chemicals, fire blankets, fire showers, first-aid boxes and eye-wash fountains
- Always wear safety goggles and a cotton laboratory coat

Working in a laboratory without the supervision of a staff member is not permitted!

1.5.3 Fire and emergencies

In case of fire and accidents call **8050**. Clearly explain the situation and location. For other less urgent matters call 5520 to report malfunctions or irregularities.

1.5.4 Hepatitis B vaccination

Everyone working in one of the laboratories of the University Medical Center Groningen must be protected against Hepatitis B infection. Since many students from Master's degree programme Molecular Biology and Biotechnology will be working in such labs, the School provides the opportunity for students to be vaccinated free of charge. Students who were not vaccinated during their Bachelor's degree programme should contact the degree programme coordinator for assistance.

1.5.5 Computers and RSI

Students spend a lot of time working at computers and are at risk of developing RSI complaints. RSI is the abbreviation for Repetitive Strain Injury and is a generic term for all conditions involving the neck, shoulders, arms, wrists and hands. These conditions can become chronic and lead to incapacity for work and cause serious limitations to everyday life.

SYMPTOMS

RSI symptoms can vary from stiffness, pain and tingling sensations, to loss of strength in the above-mentioned body parts. Initially, the symptoms occur only while working at a computer, but at later stages they also occur during rest. Ultimately, the complaints can occur continuously, causing pain during even the simplest of actions or even rendering them completely impossible.

HOW TO PREVENT RSI?

There is no standard method to prevent RSI. The measures you can take mainly involve relaxation of the muscles and the mind, and stimulation of blood flow. To minimize the risks of developing RSI, five points should be considered, the so-called 5W approach.

WORKLOAD

- Undertake regular time planning and prevent creating peaks in workload
- If necessary, take a 'study skills' course at the Centre for Study Support and Academic Skills [Bureau Studie Ondersteuning] (tel. (050) 3635548)
- Realize that your productivity is higher if you take regular breaks than if you work without interruption
- Try to keep things in perspective – it will help you avoid working for too long, stimulate you to take regular breaks and it helps you unwind
- If you do not feel on top of things drop by your study advisor, student counsellor or student psychologist

WORK ORGANIZATION

- Incorporate as much variation in your work as possible: reading, writing, typing and browsing on the internet. Also alternate easy and difficult tasks
- Use the shortcut keys on your keyboard more often than your mouse
- Take regular breaks
- Alert your tutors if you are allocated too many deadlines or too many writing assignments at the same time

WORKING HOURS

- Do not work for more than five or six hours on your computer per day. Do not forget to count the hours spent gaming and browsing on the internet. Special software has been developed to remind you to take breaks
- Take regular breaks. Take a minimum break of ten minutes every two hours of work at a computer

WORKPLACE

- Locate the screen directly in front of you, not too close. Avoid having to work with a turned neck. Ensure the top of the screen is at eye level. Avoid annoying reflections from windows. Use large font sizes, so that you do not have to lean forward to read the letters
- You need a good chair that permits the height of the back and armrests to be

1 General Information

adjusted. The back of the chair should mainly provide support to your lower back. Armrests relieve the shoulders. Adjust them so that the upper arms loosely touch them and form a right angle with your forearms

- If necessary, search for more information on the internet on how to equip your workplace
- Report unsatisfactory computer workplaces to the Occupational Health, Safety and Environment Coordinator [Arbo- en milieucoördinator]
- Never work for longer than two hours a day at a laptop. Connect an unattached keyboard and mouse to your laptop, and place the screen at eye level
- Ensure you have a good workplace at home

WORK POSTURE

- See to it that you are in good physical condition
- Sit upright and make sure that your upper and lower legs are at right angles when your feet are flat on the ground
- Keep your wrists extended when using the keyboard and mouse
- Perform regular physical exercise during work on the computer

LASTLY

- Drink a lot of water (the resulting visits to the toilet make natural breaks)
- Take early complaints seriously, check the risks applicable to your situation and find a solution. Do not ignore your body's warning signals
- If necessary, visit your family doctor or the physiotherapist at your sports centre
- A lot of information about RSI can be found on the internet
- For further questions or advice, contact the Occupational Health, Safety and Environment Coordinator [Arbo- en milieucoördinator], A.C.D. Weitenberg, tel. (050) 3634618.

2 Facilities

2.1 Libraries

The mission of the libraries of the University of Groningen is to support and promote academic teaching and research by providing high quality information and information services. The libraries aim to achieve this by adopting a demand-oriented and innovative approach. The libraries of the University of Groningen consist of the University Library (UB) and the Faculty libraries. The UB offers a basic collection for each discipline; the Faculty libraries each have a specialized collection for research and teaching purposes. Interdisciplinary works, bibliographical material and a number of special collections can also be found in the UB.

The combined libraries contain 2.4 million books and journals, more than 1.5 million of which are located in the central UB.

2.1.1 University library

The central University Library (UB) functions as a facility centre for the entire university community – for the Faculty and institutional libraries and library users. The UB offers students many services, including around 1600 study places. Furthermore, the library holds vast collections of reference and teaching material. About thirty percent of this is available in the study halls. The remaining material is kept in closed depots. This material can be accessed via the loans desk.

Practical information:

Address: Broerstraat 4, 9712 CP Groningen
P.O. Box 559, 9700 AN Groningen

Telephone: Electronic Library (050 363) 5017
Information Retrieval (050 363) 5030
Enquiries (050 363) 5020
Subject enquiries (050 363) 5020
Guided tours (050 363) 5068
Loans (050 363) 8034

Fax: (050 363) 4996

Website: www.rug.nl/bibliotheek

An important facility is the Electronic Library, located on the first floor of the UB. It has over a hundred workstations for consulting catalogues, CD-ROMs and online databases. Word processing and internet access are also provided. Access to these workstations is limited to students and staff members of the University of Groningen.

In addition to the catalogues, the following databases are also important for all students

- Online Contents (a catalogue of journal articles)
- The Dutch Union Catalogue (NCC)
- Picarta (a combination of Online Contents, the Dutch Union Manual and a manual of internet sites)

Furthermore, the University Library provides access to a large number of academic journals online, see

www.rug.nl/bibliotheek/catalogibestanden/elektijdschr/ .

Access to online journals through the WWW pages of the University of Groningen is for personal study or research only.

Downloading large numbers of articles in a systematic or regular manner is prohibited by the terms of the license agreements that the University is a party to and is therefore strictly forbidden. Abuse may harm your fellow users. Any user who does not comply with these conditions of use may be excluded from access.

Further instructions on the retrieval of information can be found on www.rug.nl/bibliotheek/instructies/algInstructies/. The 'Catalogue Training Module' teaches you how to use the catalogue; the 'Finding Scientific Information' module provides an introduction to scientific communication, document types and searching literature by subject. The introductory module 'A window on the world' introduces the library services at the University of Groningen and provides an overview of the facilities and services. This programme consists of texts and short film clips in *streaming video*.

ACCESS

You must have a library card in order to be able to borrow publications from the libraries of the University of Groningen. The student ID issued to students of the University doubles as a library card. The loan period for books is four weeks unless stated otherwise. Please return books or request a renewal before the expiry of the loan period. Failure to do so results in a fine and can lead to exclusion from further loans until the fines have been paid and the books returned. Moreover, all other costs incurred in the course of retrieving a book or replacing it will be charged to the borrower.

In general, loans can be renewed online by the user through the Catalogue of the University of Groningen, provided that the loan period has not expired and there are no fines outstanding. Click on *Borrower Info* in the Catalogue.

2.1.2 Libraries of the Faculty of Mathematics and Natural Sciences

All the books from the Faculty of Mathematics and Natural Sciences (FWN) library collection are listed in the library catalogue (OPAC). FWN library books can be recognized by the following designations:

- Bibl. Bernoulliborg (Bibl. Mathematics and Natural Sciences)
- Bibl. Chem.Fys.Milieuk. (CFM library; Chemistry, Physics, Energy & Environmental Studies)
- Bibl. Kapteyn lab. (Astronomy library)
- Bibl. Wisk.Inf.RC (Mathematics and Computing Science library)

These departmental libraries issue lists of new additions.

All the books in the library are grouped according to subject. The classification scheme should be consulted to find the correct subject codes. The local subject codes can also be used as search terms in the library catalogue (decentralized subject code).

The Biology and CFM libraries are arranged identically. All shelf numbers consist of a number followed by a letter. The number indicates the overall subject, while the letter indicates the subject subdivisions.

For example: 027G (027 – Science and Technology research; G – Normative aspects; Ethics)

The key is available in PDF form (in Dutch).

JOURNALS

The FWN library's journals collection can be divided into printed and electronic full-text journals. All these journals are listed in the library catalogue (OPAC). The printed journals can only be consulted in the library that holds the journal in

its collection. Photocopies of articles may be requested via interlibrary loan (ILL). The electronic journals (e-journals) can be consulted anywhere as long as the computer used for access is recognized as a 'University of Groningen machine'. This is usually achieved on the basis of the 'IP address'. When consulting e-journals from locations outside the University (the domain of the University of Groningen), use should be made of the proxy server. The proxy server for the University libraries offers safe, authorized access to the databases and e-journals to which the University subscribes from any computer outside the University domain.

Students can log in with their student account number. Members of staff log in using their personnel registration number.

Please note: For the most up-to-date and complete information on the journals collection (electronic or printed), consult the library catalogue!

2.1.3 Library of the University Medical Center Groningen

Visiting address: University Medical Center Groningen, Hanzeplein 1, 9713 GZ Groningen, UMCG entrance 59, Winkelstraat 1 or Poortweg 12 (Y4202), 4th Floor (Telephone: (050 363) 3048 or (050) 361 2596)

More information on the Central Medical Library can be found online: www.rug.nl/bibliotheek/locaties/bibcmb/

2.2 Photo copiers and the copy shop

BERNOULLIBORG

Cards for the photocopiers can be bought at the copy shop (first floor, building 5161). There are photocopiers in the entrance hall.

The copy shops can deliver the following services

- copies on several media
- A5 booklets, folded and stapled
- many different types of binding

For more information, contact the copy shop

2.3 Computer facilities

2.3.1 Personal account

After enrolment you will receive a student number and a personal computer account. A student account basically consists of several accounts, all accessed with the same login name and password. The accounts provide:

- access to the Faculty Novell servers for the use of computer applications
- access to the internet and for storing data
- an e-mail account
- access to Nestor, the electronic learning environment of the University of Groningen
- access to ProgressWWW, where you can enrol in modules and view your study progress

You need the following to log in: the name or address of the server, a login name and a password. Your login name is made up of your student number preceded by an 's'. Your initial password will be sent in a letter. On <http://progresswww.nl/wachtwoord> you can change your password.

2.3.2 E-mail

Your e-mail address is the primary means of communication of the University and the Faculty for news and information about your studies. Use a browser (such as Internet Explorer) and go to <https://student.rug.nl/> to access your e-mail. Your e-mail address is both your login name (s[student number]@student.rug.nl) and your name [initials separated by full stops].[infix].[surname]@student.rug.nl.

2.3.3 Nestor

Nestor is the electronic learning environment of the University of Groningen. Lecturers use Nestor to provide information about modules, to set electronic examinations and to exchange documents within their department. Students use Nestor to read announcements, to cooperate with group members and to submit assignments.

Use your student number (s[student number]) to log in. In order to gain access to modules in Nestor, enrol for your modules in ProgressWWW.

The Education Office also uses the Nestor organization Master's programmes in Biology to communicate with students. Announcements about the degree programme, modules, etc. will be placed on Nestor on a regular basis. Students are urged to check this site regularly.

2.3.4 ProgressWWW

ProgressWWW is a web-based application used by the University of Groningen. Students need to enrol for modules and exams well in advance (usually four weeks before the module is scheduled for modules and one week in advance for exams). ProgressWWW also permits you to check your results. ProgressWWW can be found on the desktop of every university computer or on the internet: <http://progresswww.nl/rug/>. More information on how to work with ProgressWWW can be found on the degree programme account on Nestor.

2.3.5 Student PCs

Computer facilities are available to students in all the School of Life Sciences buildings. You can use these PCs to log onto the student network. You will then have access to applications, your own data on the home directory (X:\) and the internet. Some of the rooms are used for practicals and modules, but when these are not scheduled you can use the room for self-study. Printers are also available for students.

2.3.6 Usage rules

Using the University IT facilities implies that you agree to the usage rules for University IT facilities as published on www.rug.nl/rc/security/aup/. Users of the university computer systems should be aware they are not the only users of these computers. Many computers are *multi-user* systems, and the users of these computers belong to a community. Therefore, the ground rule on which this AUP (Acceptable Use Policy) is based is similar to the ground rule on which traffic is based: users of the university computer systems may not endanger these systems, nor may they hinder other users. Some of the implications of this ground rule are that users are not allowed to send unsolicited e-mail or try to obtain or use other users' passwords, either accidentally or 'for fun'.

ABUSING UNIVERSITY COMPUTER SYSTEMS MAY RESULT IN DISCIPLINARY ACTION!

2.3.7 Helpdesk

Need help to log on for the first time? Have a question? Lost your password? Something not working as it should? For students at the Centre for Life Sciences call the helpdesk at the Bernoulliborg (050 363) 8100.

E-mail: servicedesk.zernike@rug.nl. or visit the website for more detailed information: <http://www.rug.nl/cit/servicedesk/overzichtservicedesks>.

2.3.8 Computer center

The Donald Smits Center for Information Technology (CIT) is the university centre for high quality IT services. To meet this objective the CIT offers many facilities:

- centrally located computers with peripherals and various workstations
- several teaching and practical rooms with almost three hundred PCs (many belonging to the educational cluster, a cooperation between the computer centre and some faculties)
- a service desk with a module counter

More information: www.rug.nl/cit/

3 Study matters

3.1 Information channels

NESTOR

The Education Office maintains the Nestorsite Master's programmes in Biology (see section 2.3.3.) which contains a wealth of information about teaching and research. The information not only covers the information found in this study guide, but also the latest information on examination and module timetables, graduation dates and procedures, etc. Nestor should be checked at least once a week, to avoid missing important events.

E-MAIL

In some cases messages of importance to students or groups of students, such as requests for enrolment for certain modules or alterations to the timetables are sent to the electronic mailbox of the students concerned. For this reason, students are expected to check their mailbox on a regular basis (at least once a week).

UK (UNIVERSITY NEWSPAPER)

The Board of the University [College van Bestuur] frequently publishes updates on the central rules and regulations in the UK. These mainly concern tuition fees, scholarships and the graduation fund.

3.2 Admission requirements

Admission requirements for Dutch students for the programmes in Biology, Ecology & Evolution, Marine Biology and Molecular Biology & Biotechnology can be found in chapters 4-7.

You will find admission requirements for the specialization Behavioural and Neurosciences in chapter 4, Biology. For the Top programme Evolutionary Biology these are described in chapter 5, Ecology & Evolution. Admission for the Top programme Biomolecular Sciences is within chapter 7, Molecular Biology & Biotechnology.

Students with a comparable Bachelor's degree from another Dutch or foreign university may also qualify for admission. However, admission is then granted on an individual basis by the Board of Examiners. The Board of Examiners will check that you have the appropriate qualifications. For international students, sufficient proficiency in English (IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is also required. Consult the programme coordinator (international students) or the study advisor (Dutch students) to find out whether you qualify for admission.

3.2.1 Conditional admission

Students who have almost finished their Bachelor's degree from the University of Groningen and want to apply to one of the Master's programmes may request conditional admission. Candidates have to prove that they have already earned 165 ECTS in one of the required Bachelor's programmes including the Bachelor's project and thesis. The remaining 15 ECTS (post-propaedeutic modules only) must be completed within six months. Requests for conditional admission must be submitted to the degree programme coordinator. Alternatively, the first proposal form for the individual programme serves as request.

3.2.2 Bridging programme

A bridging programme is available for Dutch students with a suitable bachelor degree in Higher Professional Education (HBO) for the degree programme in Molecular Biology & Biotechnology. The study load of this programme consists of 30 ECTS. For more information and assistance with application please contact the study advisor.

3.2.3 Deadline for applications

Dutch students will be freely admitted to the Master's degree programme throughout the year once they have successfully completed a Bachelor's degree programme from the University of Groningen as listed in sections 4-7.

OTHER DUTCH STUDENTS

The annual application deadline for Dutch students with Bachelor's degrees (University or Higher Professional Education (HBO)) from institutes other than the University of Groningen is 1 June.

INTERNATIONAL STUDENTS

Applications for admission to the degree programmes and given modules must be submitted to the Admissions Board before 15 April (non EU/EEA students) or 1 June (EU/EEA students). However, students intending to apply for scholarships are advised to submit their applications before 1 December. For the top programmes and the Erasmus mundus deadlines please consult:

www.rug.nl/fwn/informatievoor/internationalstudents/degree

3.3 Study and financial matters

3.3.1 Registration and tuition fees

STATUTORY FEES [wettelijk collegegeld] are set by law. Detailed information about the conditions you have to satisfy for paying statutory fee can be found on: www.rug.nl/studenten/inuitschrijving/collegegeld/tarieven/master20102011. Statutory fees for academic year 2010–2011 have been set at € 1,672.

UNIVERSITY FEES [instellingscollegegeld] If you do not satisfy all of the conditions for statutory tuition fees, you must pay university tuition fees. University tuition fees comprise different fees: university tuition fees which are the same as the statutory tuition fees (€ 1,672), and the fees for various Master's degree programmes (€ 9,500). The fee you pay depends on your personal situation. Please consult the following webpage for detailed information:

www.rug.nl/studenten/inuitschrijving/collegegeld/tarieven/master20102011

The University Student Service Desk (also see section 3.8.1) provides information about registration procedures, statutory fees and everything you need to do to ensure that your registration remains valid. They also provide students who have paid their fees and have registered as students at the University of Groningen with student cards.

Regular registration is from 1 September until 31 August.

Visiting address: Academy Building, Broerstraat 5, Groningen
1st floor, building 1112

Postal address: University of Groningen P.O. Box 72, 9700 AB Groningen

Contact: www.rug.nl/usd

Telephone: (050 363) 8004
Website: www.rug.nl/hoezithet or in English: www.rug.nl/insandouts

3.3.2 'Studiefinanciering' – IBG grants

For more information about [studiefinanciering], grants for Dutch students, consult DUO, the former Informatie Beheer Groep (IBG), Regiokantoor Groningen:
Visiting address: Kempkersberg 4, 9722 TB Groningen,
Telephone: (050) 599 7755
Internet: www.ib-groep.nl

3.3.3 Study costs

The costs of books and materials for study are relatively low. €250 each year is usually sufficient for compulsory books, lecture notes, manuals etc. The RUG has a policy on study costs. The policy aims to control costs so that the 'study cost' component does not exceed grant/loan budgets for Dutch students. The amount that students are required to spend on study materials will therefore not exceed the government grant. The standard sum for 2010-2011 is € 675,-. Each course phase has a cost 'ceiling' (standard sum x length of course). Sometimes it is not possible to avoid going beyond the ceiling amount. In such cases it is possible to apply to the Faculty Board for reimbursement of half the extra expenditure on the basis of receipts submitted as proof. Sometimes another arrangement may be possible. Further information can be obtained from the study advisor, from the Student Service Centre and on www.rug.nl/insandouts.

3.4 Examinations and registration of results

3.4.1 Academic year

Academic year 2010-2011 commences on 6 September 2010 and finishes on 15 July 2011. Resit examinations for students who have missed one or several parts of that year are usually planned for July.

3.4.2 Credits and registration

University degree programmes consist of several modules. Each module is awarded a number of ECTS credit points (ECTS: European Credit Transfer and Accumulation System). ECTS is an EU standardized system for measuring study load as a means of facilitating international mobility. One ECTS credit point represents 28 hours of full-time study (including contact hours, reading, independent study, preparation for exams, etc.). Sixty ECTS credit points represent one year.

Students will receive an overview of their marks and ECTS (a printout from the ProgressWWW registration system) every year. Should the results be registered inaccurately, students are requested to report this at once to the Student Education office at the Centre for Life Sciences (section 1.3.1).

3.4.3 Registration for modules and examinations

Many exams require students to enrol at least five working days before the date of the written examination. This can be done using the webpage:

<http://progresswww.nl/rug>. Registration should be completed in time to ensure that examinations proceed smoothly. Examiners need to know the number of participants in advance.

NOTE THAT SEPARATE REGISTRATION FOR EACH MODULE IS ALSO COMPULSORY (see section 2.3.4).

Since students often follow modules from other programmes, they are advised to be well informed about the registration procedures of those modules.

3.4.4 Grading system and registration of study results

After an exam is completed the results are processed in the automated results registration system (ProgressWWW). A list of the results achieved can be found on the internet: <http://progresswww.nl/rug>. If an official results transcript is required, a printout can be requested from the Education Office.

In general, each module will be examined either by a written or an oral examination, or by a written assignment or a presentation. The Dutch grading scale ranges from 10 (highest) to 1 (lowest). As an indication, 6 is the minimum pass mark and 10 and marks lower than 3 are highly exceptional:

- 10 outstanding; a remarkable performance; seldom given
- 9 Excellent
- 8 Very good
- 7 good
- 6 satisfactory
- <6 unsatisfactory

An 'unsatisfactory' for an exam or a report serves as a warning sign. A mark below 6 for a module means that this module has to be repeated until a 6.0 or higher is achieved.

The final cumulative mark for the whole programme is the weighted average of the individual marks for each of the elements taken in account the study load.

3.4.5 Fraud

Plagiarism is not accepted at this university or anywhere else in the academic community. In all cases where plagiarism is found or suspected, the examiner will inform the Board of Examiners. If the Board decides that plagiarism has occurred they will impose a sanction in accordance with the 'Rules and Regulations' (see Chapter 9). In general, this will result in the student being excluded from participation in examinations or other forms of testing for the relevant module for the current academic year.

3.5 Graduation

Students may request for graduation once they have passed all the necessary modules with a study load of at least 120 erts. The actual graduation is a mere formality. Students should, however, register well in advance. Graduates will receive a diploma [bul] and a diploma supplement containing an overview of each module and the marks achieved in English.

In general there are six degree certificate ceremonies held annually. However, a minimum of three graduates is required. If only 1 or 2 students wish to participate students will be requested to take part in a ceremony at a later time. A list of ceremony dates is published on:

www.rug.nl/biologie/informatievoor/studenten/aanvraagexamen.

Normally, the ceremonies take place in the Academy Building, Broerstraat 5. On request, students who drop out can receive a statement of their academic record including the modules passed.

GRADUATION PROCEDURE

Are you approaching your graduation? There are several administrative matters you must attend to yourself.

You must apply for your degree certificate in order to graduate. Preferably, you do this before you take the last compulsory part of your degree programme, for example before your last exam, or before your final report of your research project is approved. However, you must submit your request within four weeks of receiving your last examination result. **IF YOU FINISH YOUR DEGREE IN AUGUST, YOU MUST SUBMIT YOUR REQUEST FOR A FINAL ASSESSMENT BEFORE 15 SEPTEMBER.** If you do not submit a request for graduation on time, the Board of Examiners will officially declare whether and when you graduate. This graduation date will appear on your degree certificate. If this means that your graduation date falls in the next academic year, you may have to reregister and pay tuition fees.

Step by step procedure for graduation:

1. No more than four weeks after completing the last examination module and at least four weeks in advance of the desired date of a graduation ceremony, students must submit a request for graduation via ProgressWWW see for instructions: www.rug.nl/biologie/onderwijs/studentenadministratie/AanvrExamen. At this site you will also find the dates of the ceremony and how to deliver your paperwork.
2. The candidate should provide the following documents:
 - A copy of all reports (research projects and essay).
 - Examination sheets (of results not registered in Progress)
3. You will receive a letter to confirm your graduation
4. During the ceremony you validate your diploma with your autograph. If you are unable to attend the graduation ceremony, you should contact the education office immediately.
5. Graduation does not mean automatic deregistration. You must deregister yourself! See www.rug.nl/hoezithet (or www.rug.nl/insandouts)
6. When you deregister (www.studielink.nl), your student grant or loan will not be stopped automatically. You must request the [Dienst Uitvoering Onderwijs] (DUO-IB-Groep) to do this for you. You must also hand in your student travel card. For more information: www.ib-groep.nl

3.6 Objection and appeal procedures

Unfortunately, mistakes are sometimes made when applying rules and regulations. This is why the Student Charter (see chapter 9 and www.rug.nl/studenten/regelingen/studentenstatuut) includes provisions that ensure the legal protection of the student. If students feel unjustly treated, they can object and lodge an appeal. The following are the appropriate official channels:

- the Board of the University (CvB): for matters relating to that part of the Student Charter which regulates the University as a whole
- Higher Education Appeals Tribunal (CBHO): for matters that have already

been the subject of an appeal that the Board of the University has ruled on, against whose decision you wish to appeal

- Board of Appeal for Examinations (CBE): for decisions 'concerning assessment of the knowledge and understanding of a candidate who has been examined in the field concerned or has been examined in any other manner'.

An overview of all categories of objection and appeal procedures is available from the University Student Service Desk (section 3.8.1). For advice contact the study advisor (section 3.7.3) or contact the Legal Affairs department (ABJZ), tel. (050 363) 5440. The student portal and the ABJZ web pages also contain a lot of information.

COMPLAINTS

Situations can arise where specific regulations of the Student Charter have not been directly violated, but where the student still feels improperly or unjustly treated. In such a case he/she can file a complaint to the following agencies:

- **DECENTRAL** Each of the faculties and schools has its own complaints procedure. The study advisor can offer direct assistance, but she can also forward the case to, for example, the head of the Board of Examiners, a member of the Faculty Board or the Dean
- **STUDENT SERVICE DESK** If a student cannot or does not wish to contact the Faculty or school, the complaint can be discussed with a student counsellor from the University Student Service Desk. He/she will act as an ombudsman and mediate, and, if requested, demand to inspect dossiers or contact professionals (section 3.8.1)
- **THE CONFIDENTIAL ADVISOR OF THE UNIVERSITY** The confidential advisor of the University handles complaints from students feeling discriminated against by fellow students or staff of the University of Groningen (j.m.dam@rug.nl).
- **NATIONAL CONFIDENTIAL COMMISSIONER** As a last resort, the National Confidential Commissioner [Nationale Vertrouwenspersoon] can be contacted in matters of complaints and appeal. He/she will only deal with matters which cannot be dealt with by regular forms of legal protection.

3.7 Study guidance during your degree

3.7.1 Degree programme coordinator

The degree programme coordinator supports the teaching process within the programme, is the secretary of the Board of Examiners and advises the Course Committee. Students can address all programme-related questions to the programme coordinator. In general, students contact her for practical advice about the programme of study, mentor or module choice, etc.

Note that the forms for requesting approval for your study plans (see chapter 4-7) should be handed in at the Education office. These will be passed on to the Board of Examiners.

Office Location: 5173.0045

Telephone: 050 3632212

E-mail: m.van.rijssel@rug.nl

Postal address: School of Life Sciences, Centre for Life Sciences,
Nijenborgh 7, 9747 AG Groningen

Consulting hours: Mondays and Thursdays between 11 a.m and 12 p.m

3.7.2 Study mentor

Students choose a study mentor associated with their master. These mentors are assigned by the Board of Examiners to supervise students (see Chapter 8 for list of mentors). The study mentor is an experienced scientist working within the scientific domain of the master programme. The mentor guides the student throughout the whole master programme from the first module through the graduation ceremony. In this way the mentor ensures, in collaboration with the Board of Examiners, that the learning outcomes related to specific knowledge and skills are met.

Most students will choose a study mentor from the research area in which they intend to perform their first research project. In order to choose students must define their field of interest, then investigate the research group to which the potential supervisor belongs. Read recent scientific articles and get a feel for the area of activity of the group you hope to be a part of.

The mentor is responsible for ensuring the quality of the individual programme and to coach the mentee on career aspirations and on anything that might prevent the mentee from achieving his/her learning objectives. For Top programme students with a scholarship the mentor is also responsible for the evaluation of the student's progress at the end of the first year that forms the basis for the decision on continuation of the scholarship.

The mentors available are listed in chapter 8.3.

3.7.3 Study advisor

Not all students will reach the end of their degree programmes without encountering problems. Successful study depends on many different factors, and it is therefore understandable that students sometimes need to consult an impartial expert. The task of the study advisor is to assist students in finding solutions to any problems encountered while studying. In practice, this concerns matters like the choice of programme, study pace or an improvement in study methods. Problems of a more general nature (e.g. the financial consequences of study delay) are often dealt with by consulting the university student counsellors. Social matters can also be discussed with the study advisor if students need a confidant for personal problems. In some of these cases the study advisor will recommend the more specialized assistance of, for example, the student psychologists (see section 3.8.2).

The study advisor for the masters at the Centre for Life Sciences is Mrs A. F. Bos. In general she has open office hours on Mondays (room 5173.0053) between 11 a.m. and 12:30 p.m. Appointments can be made by phone 050 3638764 or E-mail (attie.bos@rug.nl). In case of absence: tel. (050 363) 2017 (secretariat).

STUDY DELAY

If circumstances beyond your control affect your progress during your studies, you may be eligible for financial assistance from the Graduation Fund [Afstudeerfonds]. The conditions are set out in the regulations pertaining to the fund [Afstudeerfondsregeling]. If you experience study delay due to circumstances beyond your control, and IF THE DELAY IS EXPECTED TO AMOUNT TO MORE THAN FOUR WEEKS, YOU MUST REPORT THIS IMMEDIATELY TO THE STUDY ADVISOR. The following can constitute grounds for financial assistance:

- illness
- family circumstances

- a disability (physical limitations)
- pregnancy
- lack of a degree programme that meets objective standards
- loss of certification for your degree programme
- other circumstances of an exceptional nature.

The study advisor will direct you to a student counsellor if your delay amounts to or will be more than 15 ECTS credits. You will have to make an appointment with a student counsellor for a follow-up report yourself.

If during the academic year the delay amounts to more than 15 ECTS after the first report to the study advisor, you must contact a student counsellor immediately, even if you have not been told to by the study advisor.

You must follow the advice of and the agreements made with the study advisor and the student counsellor or you will not be eligible for financial support from the Graduation Fund.

Apply in good time for financial assistance. If you are too late you will not receive any financial compensation.

ADJUSTMENTS TO TEACHING AND/OR EXAMS

Sometimes personal circumstances necessitate adjustments in teaching or testing. This can occur when students have dyslexia or performance disabilities due to a physical disability, a psychiatric problem or a chronic illness.

Adjustments usually involve:

- making certain facilities available (extra exam time, adapted exam material, etc.) and/or
- permitting departures from the Teaching and Examination Regulations (OER; section 9)
- extracurricular individual examinations
- different exam time or place
- relaxation of study progress rules
- replacement assignment for compulsory lectures or practical modules, etc.

In cooperation with the study advisor, you can examine what is necessary or determine which facilities you can use, which departures from the OER will be requested, whether it will be necessary to adapt your study pace or study planning, etc.

3.7.4 International officer

Every year many students choose to complete a major part of their studies abroad to add international character to their curriculum. The reasons for spending time studying abroad are diverse and include strengthening your position in the employment market, refining social and cultural skills, following modules not offered in the Netherlands, and so on.

In general, students who wish to study abroad often do their second research project in a different country. Usually this research project is conducted in the laboratory of a colleague of one of the academic staff members of the School. Before leaving, however, be sure that you have authorization from the Board of Examiners!

Students who want to study abroad have to organize many issues themselves, well in advance. Mrs. Bos, our study advisor/international officer, can advise you about grants for living and/or travelling expenses.

In general, students obtain grants from the Erasmus Life Long Learning Programme or the Marco Polo Fund.

SOCRATES/ERASMUS The purpose of the Erasmus/LLL (Life Long Learning Programme) is to improve the cooperation between European universities. Part of this European Union exchange programme is to make it possible for students to study abroad by additional funding. Exchange programmes and agreements are often limited to specific fields or disciplines. The Department of Biology/Life Science & Technology has exchange agreements with almost 30 partner institutions throughout Europe. Funds are awarded to students who are studying 3 till 12 months at one of the European partner universities

MARCO POLO Marco Polo scholarships are awarded to students who wish to study at an university outside Europe. The duration of their study abroad should be at least 3 till 12 months. The Marco Polo fund is an initiative of the University of Groningen and the Faculty of Mathematics and Natural Sciences.

More information about grants and other sources of finance can be found at : www.rug.nl/studenten/studiebegeleiding/internationalisering

3.8 Non-degree programme-related support

3.8.1 Student Service Desk

Visiting address: Broerstraat 5, building 1112, first floor

Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands

Website: www.rug.nl/hoezithet or in English: www.rug.nl/insandouts

Telephone: (050 363) 8004 from 10 a.m. till 4 p.m.

Students can go to the University Student Desk (USD) with questions about admission, enrolment, registration and deregistration, fixed intake programmes, study choice, study delay and funding. If we cannot help you, we will refer you on to the Student Service Centre or another institute.

You can also consult the knowledge base at www.rug.nl/hoezithet or www.rug.nl/insandouts if you have questions about these or other issues. If you do not find an answer to your question, just click the contact button to sent an e-mail.

You can find the contact details and opening hours of the USD at: www.rug.nl/usd

3.8.2 Student Service Centre

Students can go to the Student Service Centre (SSC) for all support issues where the answer from the degree programme is or may be insufficient. The SSC offers training programmes and courses and workshops in the field of study skills. You can also consult a student psychologist or a student counsellor.

Our student counsellors specialize in dealing with financial matters, registration and deregistration, fixed intake programmes, study choice, studying with a performance disability and complaints and appeal procedures. In the event of study delay of more than 15 ECTS credit points due to extraordinary circumstances, it is essential to make an appointment with a student counsellor in order to qualify for support from the Graduation Fund. Don't delay, arrange it today! More information can be found on: www.rug.nl/studievertraging

Our student psychologists can help with problems relating to matters such as studying, social contacts, relationship with parents, making decisions, stress and anxiety, depression and assertiveness problems. Support is provided in the form of a short series of individual sessions. Group activities, such as assertiveness training and short series of group therapy sessions, are also offered.

The SSC has a wide range of training programmes, courses and workshops in the field of studying successfully and personal development. They include developing academic writing skills, effective studying and coping with fear of failure or stress. You can find more information about our range on www.rug.nl/ssc

You can also consult the knowledge base at www.rug.nl/hoezithet if you have questions about these or other issues. If you do not find an answer to your question, just click the contact button to send an e-mail. You can find the contact details and opening hours of the SSC at: www.rug.nl/ssc.

3.8.3 Looking for your first job?

If you are about to graduate or have recently graduated, the Talent & Career Center, expertise centre for graduates, can help you to choose a career. The Center organizes courses and free theme workshops (e.g. 'Increase your chances on the job market' and 'About to graduate, what next?'), a careers café and a 'Working on your career' leaflet. Come to us if you need help when orientating yourself to the job market or when preparing job applications! Note that the Talent & Career Center offers special activities for international students in English. You can orientate yourself to the job market by attending themed meetings or the weekly careers office hour. It is also possible to make an individual appointment with one of the career counsellors.

Visiting address: Munnekeholm 2

Postal address: P.O. Box 7117, 9701 JC Groningen

Telephone: 050 311 1589

E-mail: info@talentcareercenter.nl

Details of all activities can be found on the website: www.talentcareercenter.nl

3.8.4 International Service Desk (ISD)

The International Service Desk (ISD) is part of the Office for International Relations [Bureau Internationale Samenwerking, or BIS]. It provides information to foreign students, prospective students and foreign researchers, specifically with regard to study, doing a PhD and temporary residence at the University of Groningen for research or other purposes. The ISD also assists foreign guests staying in Groningen or those responsible for their stay with any queries they may have about issues such as regulations relating to foreigners, study advice, medical care, financial matters, accommodation, and facilities and official organizations within the city. The ISD also organizes and coordinates a number of introductory and social activities jointly with organizations such as Wings, the Global Club and the Foreign Guest Club. In some cases, the ISD is solely responsible for looking after foreign guests – if, for example, they have been invited to Groningen as guests of the Board of the University or have come to the University of Groningen within the framework of a joint project with a developing country.

Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Visiting address: Broerstraat 5, Groningen
Telephone: +31 50 363 8181
Fax: +31 50 363 7100
E-mail: isd@rug.nl

3.9 International Students' association ESN-Groningen

ESN-Groningen coordinates and stimulates the international activities of the student community in Groningen. It was founded in 1988. ESN-Groningen is part of the Erasmus Student Network (ESN) and works closely with the University of Groningen. One of the functions of ESN-Groningen is to support international students. This includes finding a mentor – a Dutch student who can help with practical matters and aid foreign students in getting to know the city of Groningen and student facilities such as the libraries and the sports centre. Mentors also ensure that the first taste of student life in Groningen is an enjoyable one. During your stay in Groningen, ESN-Groningen will organize various activities to make you feel at home, such as an introductory weekend, a weekly social in the pub Rumba, trips to the island of Schiermonnikoog and to Amsterdam, ice-skating, sailing, theme parties and much more. ESN-Groningen wants you have a great time in Groningen. Every Sunday a small-scale activity such as a dinner or movie is organized in the GSP house, Kraneweg 33. Last but not least, ESN-Groningen publishes a magazine especially for international students, the WaM.

Visiting address: Grote Rozenstraat 23, 9712 TG Groningen
Telephone: 050 363 7176
E-mail: info@esn-groningen.nl
Website: www.esn-groningen.nl

Walk-in hour every Tuesday and Thursday from 1 to 3 p.m. If you want to be kept informed of all the upcoming events and activities of WINGS, send an e-mail to their e-mail address!

4 Master programme Biology

4.1 Admission

Students will be freely admitted to the degree programme Biology when they have successfully completed a bachelor's degree programme in Biology at the University of Groningen or another Dutch university.

For the specialization Behavioural and Neurosciences:

Bachelor's degree in Biology of the University of Groningen, specialization [Gedrag en Neurowetenschappen]. A Bachelor's degree in Biology or a Bachelor's degree in Life Science & Technology of the University of Groningen with major [Gedrag en Neurowetenschappen].

Students with a comparable bachelor degree from another university may also qualify for admission. However, admission is then granted on an individual basis by the Board of Examiners. The Board of Examiners will check that you have the appropriate qualifications. For international students, sufficient proficiency in English (IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is also required.

Consult the programme coordinator (international students) or the study advisor (Dutch students) to find out whether you qualify for admission.

Before starting with the degree programme, Dutch students with a bachelor degree as mentioned above need to register officially for the degree programme (via www.studielink.nl). Information concerning (conditional) admission requirements is presented in section 3.2.

Foreign students can apply via the on line application tool (see www.rug.nl/prospectivestudents/application/applicationprocedure) or contact the admission office at admissions@rug.nl.

4.2 The content of the degree programme of study

The Master's degree programme in Biology is for students who have a broad interest in Biology and also those who have a specific interest in science at the interface of different Biology domains, such as Ecology, Marine Biology, Biomedical Sciences and Molecular Biology. Within this Master's programme there is a specialization in Behavioural and Neurosciences. Students can focus on fundamental or applied research, or a combination of both. In consultation with a mentor, students design their own study programme tailored to their interests. Each individual programme must be approved by the board of examiners. The learning outcomes of the master's degree programme are described in section 1.2.

4.3 The structure of the degree programme of study

The master's programme is research oriented. It has two profiles: a research (P-) profile and a policy & management (M-) profile. In their first year all students conduct a research project. Thereafter, they choose either to continue in the P-profile or to enrol in the M-profile.

The P-profile focuses entirely on research to prepare for a career in academia or other research institutes. The study programme therefore mainly consists of

research projects, which focus on learning about conducting research by actually doing it. Students will not only independently perform experiments in the laboratory or the field, they will also go through the whole process of conducting science developing skills such as searching for and studying scientific literature, formulating hypotheses, designing and performing experiments, and presenting results.

The M-profile comprises one year of research and one year aimed at the development of policy and management-related understanding and skills to prepare for a career in a company, consultancy or policy organization. This profile is especially for students who are not only interested in science but also in the social and commercial aspects of scientific developments and products. Additional training in interactions with other disciplines, communication with non-scientists and general management skills is also part of this profile.

4.3.1 Research profile

The Research (P) profile mainly consists of independent research, which focuses on learning about conducting research by actually doing it. Students will not only independently conduct experiments in a laboratory, but also gain experience with related issues, such as formulating hypotheses, searching for and studying scientific literature and presenting results.

Requirements for the research profile:

<i>modules</i>	<i>credits</i>
colloquium	5 ECTS
electives	≤ 20 ECTS
essay	5 ECTS
optional modules	20 ECTS
research project	40 or ≥ ECTS
research project	30 or ≥ ECTS

Students design their own study programmes according to their interests. However, students must choose a study mentor – an assistant professor or professor from the list in section 8 – to advise them and discuss the contents of their individual study programmes with (section 3.7.2).

- the first research project (preferably the one ≥40 EC) must be performed at the School of Life Sciences or associated institutes under supervision of one of the examiners.
- The research projects, the colloquium and the essay must deal with different research subjects, must be supervised by a different examiner and must be approved by the Board of Examiners
- Supervisors of research projects, the colloquium, and the essay must be members of the permanent academic staff of the School of Life Sciences. A PhD student or postdoc may take on the daily supervision, but ultimate responsibility remains with the permanent staff members (see list in section 8).
- The colloquium has an entry requirement. Before it can be started, at least one research project must have been completed. In addition, before starting the second research project, the mark you received for your first project must have been registered in ProgressWWW
- Optional modules are chosen from the list presented in section 8 of this guide. The Board of Examiners may permit the student to select one or more modules within the scientific domain of the degree programme from another

master's degree programme (from the University of Groningen or from another university).

- electives may be:
 - an extension of a research project with 5-20 ECTS. Propositions for extensions of 10-20 EC must be requested before the start of the research project. Arrangements for extensions of 5-10 EC may also be made during the midterm evaluation,
 - extra master modules (section 8)
 - bachelor modules to repair specific deficiencies (not more than 10 ECTS);
 - a research assignment with a study load of 5-20 ECTS. The learning outcomes of each individual assignment must be described using the special assignment form in addition to the yellow form (see section 4.7)

All elements in the individual programme must be approved of by the Board of Examiners (use the yellow form). The assessment framework for colloquium, essay and research projects is set out in the syllabus 'Guidelines for the Master's programme' that will be available at the Education Office and Nestor.

Specialization: **Behaviour and Neurosciences**

Students generally follow the P-profile scheme and choose their mentor from the list for this specialization.

4.3.2 The Policy & Management profile

The policy and management (M) profile is the option to choose if students are not only interested in science but also in the social and commercial aspects of biology. This profile will prepare students for a career in a company or policy organization. In addition to gaining scientific knowledge, students will learn effective presentation skills, how to deal with tough deadlines, how to apply for an internship at a company or organization outside the University and how to give and receive feedback.

For details about the M profile (such as timetables, teaching staff and assignments) please consult the BBB café (www.rug.nl/fwn/mVariant/BBBcafe) and the Nestor website. Interviews with participating students, examples of internships and information about the job market are also available there. For more information, contact the internship coordinator of the M profile.

internship coordinator of the M-variant: Drs A.J. Abma
tel. 050 363 2263
a.j.abma@rug.nl

Requirements for the policy & management profile¹:

<i>modules</i>	<i>credits</i>
colloquium	5 ECTS
electives	≤ 10 ECTS
optional modules	5 ECTS
research project	40 or ≥ ECTS
policy and management internship programme	40 ECTS
module 'Beleid & Bedrijf'	20 ECTS

¹ In this variant a number of modules are taught in Dutch since most of the topics deal with societal and professional issues in the Netherlands.

Like students in the research profile, M-profile students design their own individual study programme in consultation with a mentor (section 3.7.2 and 8). In addition to the above scheme the following rules apply to the programme:

- The research project must be performed at the School of Life Sciences or associated institutes under supervision of one of the examiners.
- The research projects and the colloquium must deal with different research subjects, must be supervised by a different examiner and must be approved by the Board of Examiners.
- Supervisors of research projects, the colloquium and the thesis must be members of the permanent academic staff of the School of Life Sciences. A PhD student or postdoc may take on the daily supervision, but ultimate responsibility remains with the permanent staff members (see list in section 8).
- The colloquium has an entry requirement. Before it can be started, at least one research project must have been completed. In addition, before entering the policy and management internship programme a research project has to be completed.
- Optional modules are chosen from the list presented in section 8 of this guide. The Board of Examiners may permit the student to select one or more modules within the scientific domain of the degree programme from another master's degree programme (from the University of Groningen or from another university).
- Electives may be:
 - an extension of a research project with 5-10. Arrangements for extensions of 5-10 EC may also be made during the midterm evaluation,
 - extra master modules (section 8),
 - bachelor modules to repair specific deficiencies (not more than 10 ECTS);
 - a research assignment with a study load of 5-10 ECTS. The learning outcomes of each individual assignment must be described using the special assignment form in addition to the yellow form (see section 4.5)

All elements in the individual programme must be approved of by the Board of Examiners (use the yellow form). The assessment framework for colloquium, essay and research projects is set out in the syllabus 'Guidelines for the Master's programme' that will be available at the Education Office and Nestor.

4.4 Master modules

Optional modules and electives are chosen in consultancy with the mentor. Modules organized by the School of Life Sciences are listed in section 8 of this study guide. Up-to-date information about modules will be published on Nestor (*Master's programmes in Biology*).

Individual propositions from students will also be considered seriously by the Board of Examiners. Options are open from other departments, other universities in the Netherlands or even abroad.

More extended information about modules within the University of Groningen is found in Ocasys (www.rug.nl/ocasys). Ocasys is the course catalogue system of the University. This system contains information about all modules taught in the faculties. The information concerns the modules' contents, their lecturers, the period during which the modules are taught and the compulsory reading lists/literature.

4.5 Study planning and procedures

During the Master's degree programme you must determine for yourself which modules, individual assignments (colloquium and essay) and research projects you plan to do, when and in which order. There are constraints on the content of the programme as described in the previous sections and you have to follow procedures to make sure your programme is approved of, that you are officially registered for modules and programme etc. Take notice of the following:

1. Before starting with the degree programme you need to register officially for the degree programme via [Studielink] (section 4.1) and visit the education office to obtain
 - the most recent study guide for the degree programme;
 - access to the Nestor organization where much additional information is available.
2. The modular approach allows students to design an individual, coherent study programme tailored to his/her interest. To ensure the coherency of such an individual programme mentors were assigned by the Board of Examiners to supervise students. Mentors advise students on the contents of their individual programme and the choices that they have to make to prepare for a professional career after graduation (section 3.7.2). Therefore, before you start, you will have to choose a study mentor. Most students will choose a mentor from the research area in which they intend to perform their first research project (see section 8). In order to choose, students must define their field of interest, and thereafter, investigate the research group to which a potential supervisor belongs. Read recent scientific articles and get a feel for the area of activity of the group you hope to be a part of.
You are solely responsible for making a first appointment and maintain contact with your mentor during your master's programme.
3. Before the start of their first study element students are to submit a proposal for the individual study programme to the Board of Examiners using a special proposal form (yellow form). This form can be obtained via the Education office. The form, completed and signed by the mentor, has to be submitted at the Education office.
 - It is not required to submit a complete study programme at the start of your studies. However, hand in a new form for all additions/changes.
 - A copy of approved proposals will be sent to your home address and the mentor.
 - Note that the module Animal and Human experimentation is compulsory for students who will do animal experiments during one of their research projects.
4. Half way the research project the Education office sends a midterm evaluation form to the supervisor of the research project to verify if the project is proceeding according to plan. If you encounter difficulties of any kind don't hesitate to contact the programme coordinator or study advisor in an earlier stage of the project. If there is a need to adjust the study load of the project the midterm evaluation is the one and only moment to arrangements for extensions of 5-10 ECTS.

5. For the final assessment of research projects an assessment form is available. To complete the dossier for the Board of Examiners the original assessment form together with a hard copy version of the report is handed in at the Education office. The final grade will be processed in ProgressWWW only after receiving all the necessary information.
6. For the graduation procedures see section 3.5.

5 Master programme Marine Biology

5.1 Admission

Holders of a Bachelor's degree in Biology from the University of Groningen with the specialization [Mariene Biologie], or the specialization [Ecologie] plus the modules [Oceanografie] and [Mariene Biologie 1], are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Marine Biology on that basis.

Holders of a Bachelor's degree in Biology from the University of Groningen with the major [Mariene Biologie] or the major [Ecologie & Evolutie] plus the modules [Biologische oceanografie] and [Mariene biologie] are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Marine Biology on that basis.

Students with a comparable bachelor degree from another university may also qualify for admission. However, admission is then granted on an individual basis by the Board of Examiners. The Board of Examiners will check that you have the appropriate qualifications. For international students, a sufficient proficiency in English (IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is also required.

Consult the programme co-ordinator (international students) or the study advisor (Dutch students) to find out whether you qualify for admission.

Before starting with the degree programme, Dutch students with a bachelor degree as mentioned above need to register officially for the degree programme (via www.studielink.nl). To complete this procedure you need to, pass by the office to obtain a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement. If you are there don't forget to ask for:

- the most recent study guide of the degree programme,
- access to Nestor organization where much additional information is available.

General information concerning (conditional) admission requirements is presented in section 3.2.

Foreign students can apply via the on line application tool (see www.rug.nl/prospectivestudents/application/applicationprocedure or contact the admission office at admissions@rug.nl).

5.2 The content of the degree programme of study

Marine Biology is an international and highly interdisciplinary field. Students have the opportunity to custom design their study programme, which is strongly research oriented. During the Master's degree programme students have the opportunity to conduct research under the supervision of experienced scientists. Research may be conducted in the field, onboard research vessels and/or in the laboratory. Some examples of laboratory work include studying the influence of ultraviolet radiation on plankton, analysis of dispersal and genetic population structure of seaweeds, seagrasses, fish and invertebrates; or the molecular identification of invasive species. Field work might include studying species interactions across trophic levels in the Wadden Sea or the population dynamics of krill in the Antarctic. Whether you are interested in biological oceanography or coastal marine ecology, there are plenty of opportunities. The learning outcomes of the master's degree programme are described in section 1.2.

5.3 The structure of the degree programme of study

The master's programme is research oriented. It has two profiles: a research (P-) profile and a policy & management (M-) profile. In their first year all students conduct a research project. Thereafter, they choose either to continue in the P-profile or to enrol in the M-profile.

The P-profile focuses entirely on research to prepare for a career in academia or other research institutes. The study programme therefore mainly consists of research projects, which focus on learning about conducting research by actually doing it. Students will not only independently perform experiments in the laboratory or the field, they will also go through the whole process of conducting science developing skills such as searching for and studying scientific literature, formulating hypotheses, designing and performing experiments, and presenting results.

The M-profile comprises one year of research and one year aimed at the development of policy and management-related understanding and skills to prepare for a career in a company, consultancy or policy organization. This profile is especially for students who are not only interested in science but also in the social and commercial aspects of scientific developments and products. Additional training in interactions with other disciplines, communication with non-scientists and general management skills is also part of this profile.

5.3.1 The research profile

The Research (P) profile mainly consists of independent research, which focuses on learning about conducting research by actually doing it. Students will not only independently conduct experiments in a laboratory, but also gain experience with related issues, such as formulating hypotheses, searching for and studying scientific literature and presenting results.

Requirements for the research profile:

<i>modules</i>	<i>credits</i>
colloquium	5 ECTS
electives	≤ 20 ECTS
essay	5 ECTS
optional modules	20 ECTS
research project	40 or ≥ ECTS
research project	30 or ≥ ECTS

Students design their own study programmes according to their interests. However, students must choose a study mentor – an assistant professor or professor from the list in section 8 – to advise them and discuss the contents of their individual study programmes with (section 3.7.2).

In addition to the above scheme the following rules apply to the programme:

- the first research project (preferably the one ≥40 EC) must be performed at the School of Life Sciences, the Royal Netherlands Institute for Sea Research (NIOZ) on Texel, or the Centre for Estuarine and Marine Ecology (NIOO-CEME) in Yerseke, under supervision of one of the examiners.
- The research projects, the colloquium and the essay must deal with different research subjects, must be supervised by a different examiner and must be approved by the Board of Examiners.

- Supervisors of research projects, the colloquium, and the essay must be members of the permanent academic staff of the School of Life Sciences. A PhD student or postdoc may take on the daily supervision, but ultimate responsibility remains with the permanent staff members (see list in section 8).
- The colloquium has an entry requirement. Before it can be started, at least one research project must have been completed. In addition, before starting the second research project, the mark you received for your first project must have been registered in ProgressWWW.
- Optional modules are chosen from the list presented in section 8 of this guide. The Board of Examiners may permit the student to select one or more modules within the scientific domain of the degree programme from another master's degree programme (from the University of Groningen or from another university).
Students within the degree programme Marine Biology may use the title *Marine Scientist of the Netherlands* when they have fulfilled the requirements of their programme and passed the module *How does the Sea Work* organized by the NIOZ Royal Netherlands Institute for Sea Research (Texel) and the NIOO-Centre of Estuarine and Marine Ecology.
- electives may be:
 - an extension of a research project with 5-20 ECTS. Propositions for extensions of 10-20 EC must be requested before the start of the research project. Arrangements for extensions of 5-10 EC may also be made during the midterm evaluation,
 - extra master modules (section 8)
 - bachelor modules to repair specific deficiencies (not more than 10 ECTS);
 - a research assignment with a study load of 5-20 ECTS. The learning outcomes of each individual assignment must be described using the special assignment form in addition to the yellow form (see section 5.5)

All elements in the individual programme must be approved of by the Board of Examiners (use the yellow form). The assessment framework for colloquium, essay and research projects is set out in the syllabus 'Guidelines for the Master's programme' that will be available at the Education Office and Nestor.

5.3.2 The Policy & Management profile

For information of the **Policy & Management variant**, see section 4.3.2

5.4 Master modules

Master modules and electives are chosen in consultancy with the mentor. Modules organized by the School of Life Sciences are listed in section 8 of this study guide. Up-to-date information about modules will be published on Nestor (*Master's programmes in Biology*).

Individual propositions from students will also be considered seriously by the Board of Examiners. Options are open from other departments, other universities in the Netherlands or even abroad.

More extended information about modules within the University of Groningen is found in Ocasys (www.rug.nl/ocasys). Ocasys is the course catalogue system of the university. This system contains information about all modules taught in the faculties. The information concerns the modules' contents, their lecturers, the period during which the modules are taught and the compulsory reading lists/literature.

5.5 Study planning and procedures

During the Master's degree programme you must determine for yourself which modules, individual assignments (colloquium and essay) and research projects you plan to do, when and in which order. There are constraints on the content of the programme as described in the previous sections and you have to follow procedures to make sure your programme is approved of, that you are officially registered for modules and programme etc. Take notice of the following:

1. Before starting with the degree programme you need to register officially for the degree programme (section 5.1) and visit the education office to obtain
 - a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement, and your IBG number;
 - the most recent study guide for the degree programme;
 - access to the Nestor organization where much additional information is available.
2. The modular approach allows students to design an individual, coherent study programme tailored to his/her interest. To ensure the coherency of such an individual programme mentors were assigned by the Board of Examiners to supervise students. Mentors advise students on the contents of their individual programme and the choices that they have to make to prepare for a professional career after graduation (section 3.7.2). Therefore, before you start, you will have to choose a study mentor. Most students will choose a mentor from the research area in which they intend to perform their first research project (see section 8). In order to choose, students must define their field of interest, and thereafter, investigate the research group to which a potential supervisor belongs. Read recent scientific articles and get a feel for the area of activity of the group you hope to be a part of. You are solely responsible for making a first appointment and maintain contact with your mentor during your master's programme.
3. Before the start of their first study element students are to submit a proposal for the individual study programme to the Board of Examiners using a special proposal form (yellow form). This form can be obtained via the Education office. The form, completed and signed by the mentor, has to be submitted at the Education office.
 - It is not required to submit a complete study programme at the start of your studies. However, hand in a new form for all additions/changes.
 - A copy of approved proposals will be sent to your home address and the mentor.
 - Note that the module Animal and Human experimentation is compulsory for students who will do animal experiments during one of their research projects.
4. Half way the research project the Education office sends a midterm evaluation form to the supervisor of the research project to verify if the project is proceeding according to plan. If you encounter difficulties of any kind don't hesitate to contact the programme coordinator or study advisor in an earlier stage of the project. If there is a need to adjust the study load of the project the midterm evaluation is the one and only moment to arrangements for extensions of 5-10 ECTS.

5. For the final assessment of research projects an assessment form is available. To complete the dossier for the Board of Examiners the original assessment form together with a hard copy version of the report is handed in at the Education office. The final grade will be processed in ProgressWWW only after receiving all the necessary information.
6. For graduation procedures see section 3.5.

6 Master programme Ecology and Evolution

6.1 Admission

6.1.1 Regular programme

Holders of a Bachelor's degree in Biology from the University of Groningen with the specialization [Ecologie] or [Mariene Biologie] are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Ecology & Evolution on that basis.

Holders of a Bachelor's degree in Biology from the University of Groningen with the major [Ecologie & Evolutie] or [Mariene Biologie] are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Ecology & Evolution on that basis.

Students with a comparable bachelor degree from another university may also qualify for admission. However, admission is then granted on an individual basis by the Board of Examiners. The Board of Examiners will check that you have the appropriate qualifications. For international students, a sufficient proficiency in English (IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is also required.

Consult the programme co-ordinator (international students) or the study advisor (Dutch students) to find out whether you qualify for admission.

Before starting with the degree programme, Dutch students with a bachelor degree as mentioned above need to register officially for the degree programme (via www.studielink.nl). To complete this procedure you need to, pass by the office to obtain a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement. If you are there don't forget to ask for:

- the most recent study guide of the degree programme,
- access to Nestor organization where much additional information is available.

General information concerning (conditional) admission requirements is presented in section 3.2.

Foreign students can apply via the on line application tool (see www.rug.nl/prospectivestudents/application/applicationprocedure) or contact the admission office at admissions@rug.nl.

6.1.2 Top programme / Erasmus Mundus programme Evolutionary Biology

Admission to the (Top) programme Evolutionary Biology is highly selective. Successful candidates must demonstrate that their motivation and cognitive skills are well above average. Excellent MSc students from Ecology & Evolution and Marine Biology may apply during their first year for the Top Programme Evolutionary Biology. An admission permit is only valid for the academic year following the academic year in which the permit is granted.

Top programme Evolutionary Biology admission requirements comprise:

- 1) a relevant bachelor's degree;
- 2) proficiency in English*
- 3) sufficient knowledge of the relevant sciences;
- 4) a suitable attitude, motivation and talent to follow the top programme.

Foreign students apply Foreign students can apply via the on line application tool (www.rug.nl/fwn/onderwijs/masteropleidingen/topmasters/application or contact the admission office at admissions@rug.nl).

Dutch students deliver the following to the Education office:

- a completed application form;
- a complete curriculum vitae;
- a survey of the study results attained in academic courses so far;
- a letter in which the student states why s/he wants to follow this top programme in particular, what his/her expectations and ambitions are;
- (if desired) results of former research projects, like reports or articles;
- the names of three scientists willing to provide personal information on the applicant;
- (if desired) other documents that the student thinks useful in furthering his/her application.
- You will need to submit proof of proficiency of English as part of the admission process*,

*Exemptions

This requirement does not apply if you:

- are a native speaker and completed secondary education in any one of the following countries: Canada, USA, UK, Ireland, New Zealand, Australia
- have completed your bachelor education in any one of the following countries: Canada, USA, UK, Ireland, New Zealand, Australia
- have an International Baccalaureate
- have a European Baccalaureate diploma

Accepted test

- The International English Language Testing System (IELTS). Minimum score: 6.5 and all sections should be at least 6.0.
- The Test of English as a Foreign Language (TOEFL). Minimum total score: 580 and minimum section score 56 (paper-based) / 237 – 22 minimum section score (computer-based) / 92 and 21 minimum section score (Internet- based) for most master's programmes.
- Cambridge Certificate of Proficiency in English

Important notes

- The certificates need to be recent: not older than 2 years.
- The modality required is "academic".
- We do not accept institutional scores, with the exception as mentioned below.
- Chinese Students need to submit an IELTS or a TOEFL iBT test.
From 1 September 2008, Chinese students will be eligible to apply to study in Holland using a TOEFL score, confirmed by Neso China. Chinese students need to apply for the Neso certificate, which is an obligatory document for the study visa. Students can apply for the certificate at the same time as applying to the university.
- ONLY Indonesian application are permitted to submit an Institutional TOEFL score, under the following conditions:
 1. The application for admission to our study programmes have been sent to us by NESO Jakarta and includes the statement of Neso Jakarta on the procedures of the ITP TOEFL test organised by Neso Jakarta, TOEFL and the Indonesian International Education Foundation.
 2. The minimum score for TOEFL is: 580 (paper-based) / 237 (computer-based) / 92 (Internet- based).
 3. The ITP TOEFL score must be an equivalent of the official TOEFL scores as mentioned under condition 3.

Admission requirements for candidates for the Erasmus Mundus programme Evolutionary Biology can be found on:

www.rug.nl/prospectiveStudents/degreeProgrammes/mastersProgrammes/masters/croho60619

6.2 The content of the degree programme of study

Within the master Ecology and Evolution there are four main fields of interest: **EVOLUTIONARY ECOLOGY & GENETICS**. A central issue in evolutionary biology concerns the importance of genetic variation: how do genetic variation and natural selection result in reproductive systems, adaptation of organisms to their environment and the emergence of new species? We will try to answer this question by means of an experimental, molecular approach (genomics) and via model-based studies.

BEHAVIOURAL ECOLOGY & ECOPHYSIOLOGY. Both the morphology and physiology of an organism and its behaviour are formed by selection. Behaviour – for example the timing of reproduction, partner choice and time and route of bird migration – and physiology – for example the degree of plasticity to regulate energy use and temperature – are products of evolution. Theoretical models are paired with experimental ones to study these issues, both in the field and in the laboratory.

CONSERVATION BIOLOGY. Small populations are threatened with extinction because their habitat is fragmented. Whether these populations will indeed die out depends on their genetic structure, demography, dynamics of distribution, etc. This type of research is important, for example, for the restoration of nature reserves or the development of sustainable fishery. Examples of research projects include the effects of genetic erosion in fruit flies and the seed dispersal of plants in the Wadden area. **COMMUNITY ECOLOGY**. Species and individuals living in the same area interact with each other and with their environment. Processes of physiological adaptations and restrictions, competition, grazing, predation and succession can change a group of individuals into a community. Combining field observations, laboratory experiments and theoretical models can give us a better understanding of the mechanisms that are active in nature. The learning outcomes of the master's degree programme are described in section 1.2.

The Top programme Evolutionary Biology is embedded in the Master's degree programme Ecology & Evolution and explores the interface between ecology and evolution. Students can benefit from a wide spectrum of national and international expertise across the fields of ecology and evolution. The Top programme in Evolutionary Biology adheres to the same learning outcomes as the regular programme (section 1.2) but students follow a programme that is challenging both in content and time constraints.

Within the degree programme Ecology & Evolution qualified students can follow the Erasmus Mundus programme Evolutionary Biology, an intensified European programme which prepares for conducting top quality research in this field of ecology. For this programme the Erasmus Mundus Teaching and Examination Regulations will apply: www.evobio.eu

6.3 The structure of the degree programme of study

The master's programme is research oriented. It has two profiles: a research (P-) profile and a policy & management (M-) profile. In their first year all students conduct a research project. Thereafter, they choose either to continue in the P-profile or to enrol in the M-profile.

The P-profile focuses entirely on research to prepare for a career in academia or other research institutes. The study programme therefore mainly consists of research projects, which focus on learning about conducting research by actually

doing it. Students will not only independently perform experiments in the laboratory or the field, they will also go through the whole process of conducting science developing skills such as searching for and studying scientific literature, formulating hypotheses, designing and performing experiments, and presenting results.

The M-profile comprises one year of research and one year aimed at the development of policy and management-related understanding and skills to prepare for a career in a company, consultancy or policy organization. This profile is especially for students who are not only interested in science but also in the social and commercial aspects of scientific developments and products. Additional training in interactions with other disciplines, communication with non-scientists and general management skills is also part of this profile.

6.3.1 The research profile

The Research (P) profile mainly consists of independent research, which focuses on learning about conducting research by actually doing it. Students will not only independently conduct experiments in a laboratory, but also gain experience with related issues, such as formulating hypotheses, searching for and studying scientific literature and presenting results.

Requirements for the research profile:

<i>modules</i>	<i>credits</i>
colloquium	5 ECTS
electives	≤ 20 ECTS
essay	5 ECTS
optional modules	20 ECTS
research project	40 or ≥ ECTS
research project	30 or ≥ ECTS

Students design their own study programmes according to their interests.

However, students must choose a study mentor – an assistant professor or professor from the list in section 8 – to advise them and discuss the contents of their individual study programmes with (section 3.7.2).

In addition to the above scheme the following rules apply to the programme:

- the first research project (preferably the one ≥40 EC) must be performed at the School of Life Sciences or associated institutes, under supervision of one of the examiners.
- The research projects, the colloquium and the essay must deal with different research subjects, must be supervised by a different examiner and must be approved by the Board of Examiners
- Supervisors of research projects, the colloquium, and the essay must be members of the permanent academic staff of the School of Life Sciences. A PhD student or postdoc may take on the daily supervision, but ultimate responsibility remains with the permanent staff members (see list in section 8).
- The colloquium has an entry requirement. Before it can be started, at least one research project must have been completed. In addition, before starting the second research project, the mark you received for your first project must have been registered in ProgressWWW
- Optional modules are chosen from the list presented in section 8 of this guide. The Board of Examiners may permit the student to select one or more modules within the scientific domain of the degree programme from another

master's degree programme (from the University of Groningen or from another university).

- electives may be:
 - an extension of a research project with 5-20 ECTS. Propositions for extensions of 10-20 EC must be requested before the start of the research project. Arrangements for extensions of 5-10 EC may also be made during the midterm evaluation,
 - extra master modules (section 8)
 - bachelor modules to repair specific deficiencies (not more than 10 ECTS);
 - a research assignment with a study load of 5-20 ECTS. The learning outcomes of each individual assignment must be described using the special assignment form in addition to the yellow form (see section 6.5).

All elements in the individual programme must be approved of by the Board of Examiners (use the yellow form). The assessment framework for colloquium, essay and research projects is set out in the syllabus 'Guidelines for the Master's programme' that is available from the Education Office and Nestor.

6.3.2 The Policy & Management profile

For information of the Policy & Management profile, see section 4.3.2.

6.3.3 Top programme Evolutionary Biology

Students within the Top programme Evolutionary Biology generally follow the P-profile scheme but have to pass the following Top programme modules which are challenging both in content and time constraints

- Adaptation, Biocomplexity and Conservation; 10 ECTS
- Theoretical Ecology and Evolution; 10 ECTS
- Phylogenetics and Genomics in Ecology; 10 ECTS

In addition to these two seminar series of 2 ECTS each are required. These are chosen from a list of the "current/classic themes" seminar series.

The essay in this case is a literature study written in the form of a review article or a research proposal.

Because of the 34 ECTS obligatory modules the study load of the electives is ≤ 6 ECTS which can be used for modules, research or individual assignments

The assessment framework for colloquium, essay and research projects is more elaborate than the one used in the regular masters and is set out in the syllabus 'Guidelines for the Top programme Evolutionary Biology' that will given to you at the start of the programme.

6.4 Master modules

Master modules and electives are chosen in consultancy with the mentor. Modules organized by the School of Life Sciences are listed in section 8 of this study guide. Up-to-date information about modules will be published on Nestor (*Master's programmes in Biology*).

Individual propositions from students will also be considered seriously by the Board of Examiners. Options are open from other departments, other universities in the Netherlands or even abroad.

More extended information about modules within the University of Groningen is found in Ocasys (www.rug.nl/ocasys). Ocasys is the course catalogue system of the university. This system contains information about all modules taught in the

faculties. The information concerns the modules' contents, their lecturers, the period during which the modules are taught and the compulsory reading lists/literature.

6.5 Study planning and procedures

During the Master's degree programme you must determine for yourself which modules, individual assignments (colloquium and essay) and research projects you plan to do, when and in which order. There are constraints on the content of the programme as described in the previous sections and you have to follow procedures to make sure your programme is approved of, that you are officially registered for modules and programme etc. Take notice of the following:

1. Before starting with the degree programme you need to register officially for the degree programme (section 6.1) and visit the education office to obtain
 - a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement, and your IBG number;
 - the most recent study guide for the degree programme;
 - access to Nestor organization where much additional information is available.
2. The modular approach allows students to design an individual, coherent study programme tailored to his/her interest. To ensure the coherency of such an individual programme mentors were assigned by the Board of Examiners to supervise students. Mentors advise students on the contents of their individual programme and the choices that they have to make to prepare for a professional career after graduation.
Top programme students choose their mentor at the end of the first semester during which they have plenty of time to get to know the mentors. (During the first semester the degree programme coordinator will be the one to turn to when you have questions about the programme). Students in the regular programme already have to choose a mentor before they start. Most students will choose a mentor from the research area in which they intend to perform their first research project (see section 8). In order to choose, students must define their field of interest, and thereafter, investigate the research group to which a potential supervisor belongs. Read recent scientific articles and get a feel for the area of activity of the group you hope to be a part of. You are solely responsible for making a first appointment and maintain contact with your mentor during your master's programme.
3. Before the start of their first study element students are to submit a proposal for the individual study programme to the Board of Examiners using a special proposal form (yellow form). This form can be obtained via the Education office. The form, completed and signed by the mentor, has to be submitted at the Education office.
 - It is not required to submit a complete study programme at the start of your studies. However, hand in a new form for all additions/changes.
 - A copy of approved proposals will be sent to your home address and the mentor.
 - Note that the module Animal and Human experimentation is compulsory for students who will do animal experiments during one of their research projects.

4. Half way the research project the Education office sends a midterm evaluation form to the supervisor of the research project to verify if the project is proceeding according to plan. If you encounter difficulties of any kind don't hesitate to contact the programme coordinator or study advisor in an earlier stage of the project. If there is a need to adjust the study load of the project the midterm evaluation is the one and only moment to arrangements for extensions of 5-10 ECTS.
5. For the final assessment of research projects an assessment form is available. To complete the dossier for the Board of Examiners the original assessment form together with a hard copy version of the report is handed in at the Education office. The final grade will be processed in ProgressWWW only after receiving all the necessary information.
6. For graduation procedures see section 3.5.

7 Master programme Molecular Biology and Biotechnology

7.1 Admission

7.1.1 Regular programme

- Holders of a Bachelor's degree in Biology from the University of Groningen with the specialization [Moleculaire Biologie] or [Biotechnologie], specialization [Medische biologie] plus the modules [Algemene chemie] and [Bioinformatica] are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Molecular Biology & Biotechnology on that basis. Holders of a Bachelor's degree in Biology or a Bachelor's degree in Life Science & Technology from the University of Groningen with the major [Moleculaire Levenswetenschappen], major [Biomedische wetenschappen] or the combination of the major [Gedrag en Neurowetenschappen] and the minor [Moleculaire Levenswetenschappen], are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Molecular Biology and Biotechnology on that basis.
- Holders of a Bachelor's degree in Chemistry with specialization Biochemistry or Biophysical Chemistry are admitted to this master's programme.
- Holders of the Bachelor's degree in Life Science and Technology, specialization Genomics & Proteomics or Molecular Medical Cell biology are admitted into this master's programme

Students with a comparable bachelor degree from another university may also qualify for admission. However, admission is then granted on an individual basis by the Board of Examiners. The Board of Examiners will check that you have the appropriate qualifications. For international students, a sufficient proficiency in English (IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is also required.

Consult the programme co-ordinator (international students) or the study advisor (Dutch students) to find out whether you qualify for admission.

Before starting with the degree programme, Dutch students with a bachelor degree as mentioned above need to register officially for the degree programme (via www.studielink.nl). To complete this procedure you need to, pass by the office to obtain a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement. If you are there don't forget to ask for:

- the most recent study guide of the degree programme,
- access to the Nestor organization where much additional information is available.

General information concerning (conditional) admission requirements is presented in section 3.2.

Foreign students can apply via the on line application tool (see www.rug.nl/prospectivestudents/application/applicationprocedure) or contact the admission office at admissions@rug.nl.

7.1.2 Top programme Biomolecular Sciences

Admission to the Top programme Biomolecular Sciences is highly selective. Successful candidates must demonstrate that their motivation and cognitive

skills are well above average. Excellent MSc students from Molecular Biology & Biotechnology may apply during their first year for the Top Programme Biomolecular Sciences. An admission permit is only valid for the academic year following the academic year in which the permit is granted

Top programme Biomolecular Sciences admission requirements comprise:

- 1) a relevant bachelor's degree;
- 2) proficiency in English*
- 3) sufficient knowledge of the relevant sciences;
- 4) a suitable attitude, motivation and talent to follow the top programme.

Foreign students can apply via the on line application tool

(www.rug.nl/fwn/onderwijs/masteropleidingen/topmasters/application or contact the admission office at admissions@rug.nl).

Dutch students deliver the following to the Education office:

- a completed application form;
- a complete curriculum vitae;
- a survey of the study results attained in academic courses so far;
- a letter in which the student states why s/he wants to follow this top programme in particular, what his/her expectations and ambitions are;
- (if desired) results of former research projects, like reports or articles;
- the names of three scientists willing to provide personal information on the applicant;
- (if desired) other documents that the student thinks useful in furthering his/her application.
- You will need to submit proof of proficiency of English as part of the admission process*.

*Exemptions

This requirement does not apply if you:

- are a native speaker and completed secondary education in any one of the following countries: Canada, USA, UK, Ireland, New Zealand, Australia
- have completed your bachelor education in any one of the following countries: Canada, USA, UK, Ireland, New Zealand, Australia
- have an International Baccalaureate
- have a European Baccalaureate diploma

Accepted test

- The International English Language Testing System (IELTS). Minimum score: 6.5 and all sections should be at least 6.0.
- The Test of English as a Foreign Language (TOEFL). Minimum total score: 580 and minimum section score 56 (paper-based) / 237 – 22 minimum section score (computer-based) / 92 and 21 minimum section score (Internet- based) for most master's programmes.
- Cambridge Certificate of Proficiency in English

Important notes

- The certificates need to be recent: not older than 2 years.
- The modality required is "academic".
- We do not accept institutional scores, with the exception as mentioned below.
- Chinese Students need to submit an IELTS or a TOEFL iBT test.
From 1 September 2008, Chinese students will be eligible to apply to study in Holland using a TOEFL score, confirmed by Neso China. Chinese students need to apply for the Neso certificate, which is an obligatory document for the study visa. Students can apply for the certificate at the same time as applying to the university.
- ONLY Indonesian application are permitted to submit an Institutional TOEFL score, under the following conditions:

1. The application for admission to our study programmes have been sent to us by NESO Jakarta and includes the statement of Neso Jakarta on the procedures of the ITP TOEFL test organised by Neso Jakarta, TOEFL and the Indonesian International Education Foundation.
2. The minimum score for TOEFL is: 580 (paper-based) / 237 (computer-based) / 92 (Internet- based).
3. The ITP TOEFL score must be an equivalent of the official TOEFL scores as mentioned under condition 3.

7.2 The content of the degree programme of study

Research within the master Molecular Biology and Biotechnology is in the field of biomolecular sciences, with a strong focus on proteins. The aim is to fully understand regulation, the structure and dynamics of proteins in relation to their function and activity in living cells and to obtain an understanding of the fundamental properties of proteins and microorganisms that are relevant for application in health and bio(nano)-technology. Through Synthetic Biology, this fundamental knowledge is combined with that of other disciplines to design and develop novel functional biological and semi-artificial systems. The research is primarily fundamental and curiosity-driven; it is often multidisciplinary and collaborative with specialization in the following key areas:

- Systems biology of microorganisms
- Molecular cell biology
- Membrane proteins
- Structure-function relationship of proteins
- Microbial biotechnology and biocatalysis
- Chemical and synthetic biology

Within these six key research themes, various research questions address processes that relate to human health and disease development. These include:

- i) research on peroxisome homeostasis with the aim of understanding the biogenesis, ageing and turnover of peroxisomes in yeasts, being a suitable model for peroxisome-related diseases,
- ii) the production and modification of (synthetic) antibiotics with respect to demand for new antibiotics, and
- iii) the study on proteins involved in drug resistance, virulence and microbial infections.

The learning outcomes of the master's degree programme are described in section 1.2.

The Top programme Biomolecular Sciences is embedded in the Master's degree programme Molecular Biology & Biotechnology and explores the same key research themes. During the Top programme in Biomolecular Sciences, students acquire top quality research competences in such a way that they become highly attractive for a research career in the area of Biomolecular Sciences and often will continue this by subsequently starting PhD research. The Top programmes Biomolecular Sciences do adhere to the same learning outcomes as the regular programme (section 1.2) but students follow a programme that is challenging both in content and time constrains.

7.3 The structure of the degree programme of study

The master's programme is research oriented. It has two profiles: a research (P-) profile and a policy & management (M-) profile. In their first year all students conduct a research project. Thereafter, they choose either to continue in the P-profile or to enrol in the M-profile.

The P-profile focuses entirely on research to prepare for a career in academia or other research institutes. The study programme therefore mainly consists of research projects, which focus on learning about conducting research by actually doing it. Students will not only independently perform experiments in the laboratory or the field, they will also go through the whole process of conducting science developing skills such as searching for and studying scientific literature, formulating hypotheses, designing and performing experiments, and presenting results.

The M-profile comprises one year of research and one year aimed at the development of policy and management-related understanding and skills to prepare for a career in a company, consultancy or policy organization. This profile is especially for students who are not only interested in science but also in the social and commercial aspects of scientific developments and products. Additional training in interactions with other disciplines, communication with non-scientists and general management skills is also part of this profile.

7.3.1 The research profile

The Research (P) profile mainly consists of independent research, which focuses on learning about conducting research by actually doing it. Students will not only independently conduct experiments in a laboratory, but also gain experience with related issues, such as formulating hypotheses, searching for and studying scientific literature and presenting results.

Requirements for the research profile:

<i>modules</i>	<i>credits</i>
colloquium	5 ECTS
electives	≤ 20 ECTS
essay	5 ECTS
optional modules	20 ECTS
research project	40 or ≥ ECTS
research project	30 or ≥ ECTS

Students design their own study programmes according to their interests. However, students must choose a study mentor – an assistant professor or professor from the list in section 8 – to advise them and discuss the contents of their individual study programmes with (section 3.7.2).

In addition to the above scheme the following rules apply to the programme:

- the first research project (preferably the one ≥40 EC) must be performed at the School of Life Sciences, School of Natural Sciences & Technology or the University Medical Center Groningen under supervision of one of the examiners.
- The research projects, the colloquium and the essay must deal with different research subjects, must be supervised by a different examiner and must be approved by the Board of Examiners
- Supervisors of research projects, the colloquium, and the essay must be

members of the permanent academic staff of the School of Life Sciences. A PhD student or postdoc may take on the daily supervision, but ultimate responsibility remains with the permanent staff members (see list in section 8).

- The colloquium has an entry requirement. Before it can be started, at least one research project must have been completed. In addition, before starting the second research project, the mark you received for your first project must have been registered in ProgressWWW
- Optional modules are chosen from the list presented in section 8 of this guide. The Board of Examiners may permit the student to select one or more modules within the scientific domain of the degree programme from another master's degree programme (from the University of Groningen or from another university).
- electives may be:
 - an extension of a research project with 5-20 ECTS. Propositions for extensions of 10-20 EC must be requested before the start of the research project. Arrangements for extensions of 5-10 EC may also be made during the midterm evaluation,
 - extra master modules (section 8)
 - bachelor modules to repair specific deficiencies (not more than 10 ECTS);
 - a research assignment with a study load of 5-20 ECTS. The learning outcomes of each individual assignment must be described using the special assignment form in addition to the yellow form (see section 5.5)
 - Students selected for the International Genetically Engineered Machine competition iGEM may file their contribution as elective. See for details www.rug.nl/ocasys.

All elements in the individual programme must be approved of by the Board of Examiners (use the yellow form). The assessment framework for colloquium, essay and research projects is set out in the syllabus 'Guidelines for the Master' programme' that is available from the Education Office.

7.3.2 The Policy & Management profile

For information of the Policy & Management profile, see section 4.3.2.

7.3.2 Top programme Biomolecular Sciences

Students within the Top programme Biomolecular sciences generally follow the P-profile scheme but have to pass the following Top programme modules which are challenging both in content and time constraints

- GBB Introduction + Introduction to membrane proteins and Bioinformatics; 2 ECTS
- Advances in signal transduction; 5 ECTS
- Advanced Genomics and proteomics; 5 ECTS
- Organelle and membrane biogenesis; 5 ECTS
- Molecular dynamics and modelling of membranes and proteins ; 5 ECTS
- Protein and enzyme engineering by mutagenesis and directed evolution; 5 ECTS
- Advanced protein crystallography; 5 ECTS

The essay in this case is a literature study written in the form of a research proposal.

Because of the 32 ECTS obligatory modules the study load of the electives is ≤ 8 ECTS which can be used for modules, research or individual assignments

The assessment framework for colloquium, essay and research projects is more elaborate from the one used in the regular masters and is set out in the syllabus 'Guidelines for the Top programme Biomolecular Sciences that will given to you at the start of the programme.

7.4 Master modules

Master modules and electives are chosen in consultancy with the mentor. Modules organized by the School of Life Sciences are listed in section 8 of this study guide. Up-to-date information about modules will be published on Nestor (*FWN Students Master Biology and Life Science*).

Individual propositions from students will also be considered seriously by the Board of Examiners. Options are open from other departments, other universities in the Netherlands or even abroad.

More extended information about modules within the University of Groningen is found in Ocasys (www.rug.nl/ocasys). Ocasys is the course catalogue system of the university. This system contains information about all modules taught in the faculties. The information concerns the modules' contents, their lecturers, the period during which the modules are taught and the compulsory reading lists/literature.

7.5 Study planning and procedures

During the Master's degree programme you must determine for yourself which modules, individual assignments (colloquium and essay) and research projects you plan to do, when and in which order. There are constraints on the content of the programme as described in the previous sections and you have to follow procedures to make sure your programme is approved of, that you are officially registered for modules and programme etc. Take notice of the following:

1. Before starting with the degree programme you need to register officially for the degree programme (section 7.1) and visit the education office to obtain
 - a. a declaration of admission to the final assessment [verklaring toelating afsluitend examen; v.t.a.e.]. Bring a copy of your bachelor's degree with the diploma supplement, and your IBG number;
 - b. the most recent study guide for the degree programme;
 - c. access to the Nestor organization where much additional information is available.
2. The modular approach allows students to design an individual, coherent study programme tailored to his/her interest. To ensure the coherency of such an individual programme mentors were assigned by the Board of Examiners to supervise students. Mentors advice students on the contents of their individual programme and the choices that they have to make to prepare for a professional career after graduation (section 3.7.2). Top programme students choose their mentor at the end of the first semester during which they have plenty of time to get to know the mentors. (During the first semester the degree programme coordinator will be the one to turn to when you have questions about the programme). Students in the regular programme already have to choose a mentor before they start. Most students will choose a mentor from the research area in which they intend to perform their first research project (see section 8). In order to choose, students must

define their field of interest, and thereafter, investigate the research group to which a potential supervisor belongs. Read recent scientific articles and get a feel for the area of activity of the group you hope to be a part of. You are solely responsible for making a first appointment and maintain contact with your mentor during your master's programme.

3. Before the start of their first study element students are to submit a proposal for the individual study programme to the Board of Examiners using a special proposal form (yellow form). This form can be obtained via the Education office. The form, completed and signed by the mentor, has to be submitted at the Education office.
 - a. It is not required to submit a complete study programme at the start of your studies. However, hand in a new form for all additions/changes.
 - b. A copy of approved proposals will be sent to your home address and the mentor.
 - c. Note that the module Animal and Human experimentation is compulsory for students who will do animal experiments during one of their research projects.
4. Half way the research project the Education office sends a midterm evaluation form to the supervisor of the research project to verify if the project is proceeding according to plan. If you encounter difficulties of any kind don't hesitate to contact the programme coordinator or study advisor in an earlier stage of the project. If there is a need to adjust the study load of the project the midterm evaluation is the one and only moment to arrangements for extensions of 5-10 ECTS.
5. For the final assessment of research projects an assessment form is available. To complete the dossier for the Board of Examiners the original assessment form together with a hard copy version of the report is handed in at the Education office. The final grade will be processed in ProgressWWW only after receiving all the necessary information.
6. For graduation procedures see section 3.5.

8 Modules and Mentors

8.1 Study methods

Lectures Theoretical parts of the programmes usually are treated in lectures. Theory is explained and illustrated with applications.

Tutorials [werkcolleges] In many cases lectures will be complemented with tutorials or exercise classes. Small groups of students make exercises or discuss difficulties under the direction of a lecturer.

Practicals Practicalis are an important part of the studies. The practicals are composed of experiments lasting one or more days or they are complete projects, depending on the phase of the studies.

Research project Research projects are a part of the study in which experimental and/or theoretical and/or descriptive scientific research is carried out at the university, a company or a government organization. Each research project should be concluded by a written report and an oral presentation for the research group.

A research project comprises at least 30 EC (including report, talk, discussion, etc.) and should be carried out under daily supervision of a permanent academic staff member of the school of life sciences or associated institutes. Depending on the chosen profile, a second research project, can be part of the programme. The second research project should treat a different subject and should be guided by a different supervisor. Guidelines for research projects and the assessments are on Nestor.

Internship An internship (traineeship) is an essential part of the Policy & Management profile. The goal of the traineeship is to learn the organization and methods of a company or public authority, where results of medical pharmaceutical oriented researches are put into practice. An assignment will be done in such an organization and is always accompanied by an external guide. However, the final responsibility lies by an academic staff member of the school of life sciences.

Colloquium and essay The Master's degree programme is concluded with a colloquium and an essay. A relative short time (3.5 weeks) is available to study a certain aspect of the scientific domain of the masters programme is treated thoroughly. The results of the literature research are written down in an essay (thesis) or presented in a talk (colloquium). It is important that the subjects do not have overlap with the research projects. Guidelines for colloquium and essay are on Nestor. For Top programmes there are different guidelines for assessment.

8.2 Master modules

Master modules are chosen in consultancy with a mentor (section 3.7.2). Master modules usually serve as preparation for the research projects.

Up-to-date information about modules will be published on Nestor.

The following list presents optional modules and electives@. The column on the right indicates the master's programmes for which the modules were developed

in particular: B: Biology, BN: specialization Behaviour and Neurosciences in the master's programme Biology, EE: Ecology and Evolution, MB: Marine Biology, MBB: Molecular Biology and Biotechnology.

@Unless indicated otherwise modules may be part of your programme either as "optional modules" or as "electives".

General modules within the school of Life Sciences:

Module	ECTS	entry requirements	examination	practical	programme
Animal and human experimentation: Design, Practice and Ethics	5	-	laboratory skills, written report, oral presentation	x	B, BN, EE, MB, MBB
Orientation on International Scientific Careers	5	-	laboratory skills, written report, oral presentation	x	B, BN, EE, MB, MBB
Radioisotopes in experimental biology	5	-	laboratory skills, written exam	x	B, BN, EE, MB, MBB
Advanced statistics	5	*	written exam	x	B, BN, EE, MB, MBB
Programming C++ for biologists	5	-	assignment	x	B, BN, EE, MB, MBB

*For entry requirements see module description in Ocasys

Modules organised by the research institute CEES:

Module	ECTS	entry requirements	examination	practical	programme
Current themes seminar series	2	-	assignments	x	B, EE, MB
Groningen lectures in theoretical biology	2-6		Written report		B, BN, EE, MB
<i>CEES lectures</i>	2	-	<i>participation</i>		<i>B, EE, MB</i>
Mathematical models in ecology and evolution	6	*	Written exam		B, BN, EE, MB
Selforganisation, cognition and Social Systems	5	*	assignments	x	B, EE, MB,
The function of marine biodiversity	5		Assignments	x	B, EE, MB
Polar Ecosystems	5		Assignments		B, EE, MB
<i>Ecosystems Mediterranean rocky shores#</i>	5	*	<i>Assignments</i>	x	<i>MB</i>
<i>Sustainability of Marine environments#</i>	5		<i>Assignments</i>		<i>B, EE, MB</i>

not in 2010/2011

*For entry requirements see module description in Ocasys

Modules organised by the research institute CBN and GUIDE:

Module	ECTS	entry requirements	examination	practical	programme
Advanced imaging techniques	5	*	written exam, oral presentation	x	B, BN
Neurodegenerative diseases	5	*	written exam, oral presentation	x	B, BN
Behavioural pharmacology	5	-	written exam, oral presentation	x	B, BN
Introduction to the Behavioural and Cognitive Neurosciences (Introduction BCN)	4	-	written reports	x	B, BN
Current themes in inflammation and cancer	5	immunologie I	written exam, oral presentation	x	B, BN, MBB
Advanced metabolism & nutrition	5	metabolisme & voeding	written exam, assignment	x	B, BN
Nutrigenomics research	5	metabolisme & voeding	written exam, assignment	x	B
Current themes in healthy aging	5	-	written reports, oral presentation	x	B, BN, MBB
Stem cells & regenerative medicine (Stem cells & tissue engineering)	5	regenerative medicine or moleculaire biologie & medische biologie, or immunologie I	written report oral presentation,	x	B, MBB
Immunology: from bed side to bench and back	5	immunologie I+II	written exam, oral presentation, report	x	B

*For entry requirements see module description in Ocasys

Modules organised by the research institute GBB:

Module	ECTS	entry requirements	examination	practical	programme
Advanced protein crystallography	5	-	Written exam, oral presentation	x	B, MBB
Protein crystallography 2	5	-	Written exam	X	B, MBB
Multidimensional NMR 2	5	-	Written exam, oral presentation	x	B, MBB
Electron microscopy of biological macromolecules	5	-	Written exam, oral presentation	x	B, MBB
DNA microarray analysis	5	*	Written exam, oral presentation	x	B, BN, EE, MB, MBB
Introduction to membrane proteins and Bioinformatics	2	*	Written exam, oral presentation	x	B, MBB
Advances in signal transduction	5	*	Written exam, oral presentation	x	B, MBB
Advanced genomics and proteomics	5	*	Written exam, oral presentation	x	B, MBB
Organelle and membrane biogenesis	5	*	Written exam, oral presentation	x	B, MBB
Molecular Dynamics and modeling of Membranes and Proteins	5	*	Written exam, oral presentation	x	B, MBB
Protein and Enzyme Engineering by Mutagenesis and Directed Evolution	5	*	Written exam, oral presentation	x	B, MBB
Biocatalysis & green chemistry #	5	*	Written exam, assignments		B, MBB
Topics in Enzymology	5	-	Written exam	x	B, BMS, MBB, MPS

not in 2010/2011

Electives organised by Education and Communication^a:

Elective	ECTS	entry requirements	examination	practical	programme
Communiceren en presenteren (compres)	5	-	assignments	x	B, BN, EE, MB, MBB
Ontwerpen	10	*	assignments	x	B, BN, EE, MB, MBB
Wetenschap in beeld	5	*	assignments	x	B, BN, EE, MB, MBB
Wetenschapsvoorlichting en -journalistiek	5	*	assignments	x	B, BN, EE, MB, MBB
Inleiding onderzoeksmethoden	5	*	assignments	x	B, BN, EE, MB, MBB

^a These modules are instructed in Dutch

* For entry requirements see module description in Ocasys

Modules/Elective organised by Sciences and Society:

Compulsory for the M profile, elective for the P profile	ECTS	entry requirements	examination	practical	programme
<i>Beleid & Bedrijf^a</i>	10,20	-	assignments	x	B, BN, EE, MB, MBB

^a This module is instructed in Dutch.

Electives organised by Energy and Environmental sciences:

Elective	ECTS	entry requirements	examination	practical	programme
Introduction energy and environmental studies I	5	-	assignments	x	B, EE, MB
Resources and sustainable development	15	*	assignments	x	B, EE, MB

*For entry requirements see module description in Ocasys

8.3 List of Mentors:

Each of the mentors on the list may be selected as mentor for the degree programme Biology

Students enrolled in the Top programme Evolutionary biology may choose from the mentors Ecology & Evolution as well as Marine Biology.

Behaviour and Neurosciences

Beersma, Prof. D.G.M.	Chronobiology
Dijk, Prof. G. van	Neuroendocrinology
Groothuis, Prof. A.G.G.	Behavioural Biology
Koolhaas, Prof. J.M.	Behavioural Physiology
Luiten, Prof. P.G.M.	Molecular Neurobiology
Scheurink, Prof. A.J.W.	Neuroendocrinology
Zee, Prof. E.A. van der	Molecular Neurobiology

Marine Biology

Baar, Prof. H.J.W. de	Ocean Ecosystems
Buma, Prof. A.G.J.	Ocean Ecosystems
Olsen, Prof. J.L.	Marine Benthic Ecology and Evolution
Stam, Prof. W.T.	Marine Benthic Ecology & Evolution
Stamhuis, Prof. Dr. E.J.	Ocean Ecosystems

Ecology & Evolution

Beukeboom, Prof. L.W.	Evolutionary Genetics
Bijlsma, Prof. R.	Theoretical Biology
Elsas, Prof. J.D.	Microbial Ecology
Elzenga, Prof. J.T.M.	Plant Physiology
Hemelrijk, Prof. C.K.	Theoretical Biology
Kok, Dr. L.J. de	Plant Physiology
Komdeur, Prof. J.	Animal Ecology

8 Modules & Mentors

Olf, Prof. H.	Community & Conservation ecology
Piersma, Prof. J.	Animal Ecology
Pen, Prof. I.R.	Theoretical Biology
Tinbergen, Prof. J.M.	Animal Ecology
Weissing, Prof. F.J.	Theoretical Biology

Molecular biology & Biotechnology

Dijkhuizen, Prof. L.	Microbial Physiology
Dijkstra, Prof. B.W.	X-ray Crystallography
Driessen, Prof. A.J.M.	Molecular Microbiology
Fraaije, Prof. M.W.	Biotechnology
Haastert, Prof. P.J.M. van	Cell Biology
Jansen, Prof. R.C.	Bioinformatics
Klei, Prof. I.J. van der	Molecular Cell Biology
Kok, Prof. J.	Molecular Genetics
Kuipers, Prof. O.P.	Molecular Genetics
Linskens, Dr. M.H.K.	Cell Biology/ Isotope Laboratory
Poolman, Prof. B.	Enzymology
Slotboom, Prof. D.J.	Enzymology

8.4 list of permanent staff and members of the Board of Examiners

Center for Behaviour and Neurosciences (CBN)

Dijkstra, Dr. C.	Behavioural Biology	C.Dijkstra@rug.nl
Groothuis, Prof. A.G.G.	Behavioural Biology	A.G.G.Groothuis@rug.nl
Verhulst, Prof. S.	Behavioural Biology	S.Verhulst@rug.nl
Boer, Dr. S.F. de	Behavioural Physiology	S.F.de.Boer@rug.nl
Buwalda, Dr. B.	Behavioural Physiology	B.Buwalda@rug.nl
Koolhaas, Prof. J.M.	Behavioural Physiology	J.M.Koolhaas@rug.nl
Meerlo, Dr. P.	Behavioural Physiology	P.Meerlo@rug.nl
Ruiter, Dr. A.J.H. de	Behavioural Physiology	A.J.H.de.Ruiter@rug.nl
Beersma, Prof. D.G.M.	Chronobiology	D.G.M.Beersma@rug.nl
Daan, Prof. S.	Chronobiology	S.Daan@rug.nl
Hut, Dr. R.A.	Chronobiology	R.A.Hut@rug.nl
Merrow, Prof. M.	Chronobiology	M.Merrow@rug.nl
Visser, Prof. M.E.	Chronobiology	M.E.Visser@rug.nl
Gerkema, Prof. M.P.	Chronobiology/SSG	M.P.Gerkema@rug.nl
Eisel, Prof. U.L.M.	Molecular Neurobiology	U.L.M.Eisel@rug.nl
Luiten, Prof. P.G.M.	Molecular Neurobiology	P.G.M.Luiten@rug.nl
Zee, Prof. E.A. van der	Molecular Neurobiology	E.A.van.der.Zee@rug.nl
Schmidt, Prof. M.	Molecular Pharmacology (GRP)	M.Schmidt@rug.nl
Dijk, Prof. G. van	Neuroendocrinology	Gertjan.van.Dijk@rug.nl
Scheurink, Prof. A.J.W.	Neuroendocrinology	A.J.W.Scheurink@rug.nl
Strubbe, Prof. J.H.	Neuroendocrinology	J.H.Strubbe@rug.nl

Centre for Ecological and Evolutionary Studies (CEES)

Dietz, Dr. M.W.	Animal Ecology	M.W.Dietz@rug.nl
Komdeur, Prof. J.	Animal Ecology	J.Komdeur@rug.nl
Piersma, Prof. J.	Animal Ecology	T.Piersma@rug.nl
Tieleman, Dr. B. I.	Animal Ecology	B.I.Tieleman@rug.nl
Tinbergen, Prof. J.M.	Animal Ecology	J.M.Tinbergen@rug.nl
Etienne, Dr. R.	Community&Conservation ecology	R.S.Etienne@rug.nl
Olf, Prof. H.	Community&Conservation ecology	H.Olf@rug.nl

8 Modules & Mentors

Beukeboom, Prof. L.W.	Evolutionary Genetics	L.W.Beukeboom@rug.nl
Schilthuizen, Prof. M.	Evolutionary Genetics	M.Schilthuizen@rug.nl
Wertheim, Dr. B.	Evolutionary Genetics	B.Wertheim@rug.nl
Zande, Dr. L. van de	Evolutionary Genetics	Louis.van.de.Zande@rug.nl
Eriksson, Dr. B.D.H.K.	Marine Benthic Ecology&Evolution	B.D.H.K.Eriksson@rug.nl
Heip, Prof. C.H.R.	Marine Benthic Ecology&Evolution	C.H.R.Heip@rug.nl
Olsen, Prof. J.L.	Marine Benthic Ecology&Evolution	J.L.Olsen@rug.nl
Stam, Prof. W.T.	Marine Benthic Ecology & Evolution	W.T.Stam@rug.nl
Elsas, Prof. J.D.	Microbial Ecology	J.D.van.Elsas@rug.nl
Falcao Salles, Dr. J.	Microbial Ecology	J.Falcao.Salles@rug.nl
Baar, Prof. H.J.W. de	Ocean Ecosystems	H.J.W.de.Baar@rug.nl
Buma, Prof. A.G.J.	Ocean Ecosystems	A.G.J.Buma@rug.nl
Stamhuis, Prof. Dr. E.J.	Ocean Ecosystems	E.J.Stamhuis@rug.nl
Elzenga, Prof. J.T.M.	Plant Physiology	J.T.M.Elzenga@rug.nl
Kok, Dr. L.J. de	Plant Physiology	L.J.de.Kok@rug.nl
Bijlsma, Prof. R.	Theoretical Biology	R.Bijlsma@rug.nl
Engqvist, Dr. L.M.	Theoretical Biology	L.M.Engqvist@rug.nl
Hemelrijk, Prof. C.K.	Theoretical Biology	C.K.Hemelrijk@rug.nl
Pen, Prof. I.R.	Theoretical Biology	I.R.Pen@rug.nl
Weissing, Prof. F.J.	Theoretical Biology	F.J.Weissing@rug.nl

Groningen Biomolecular Sciences and Biotechnology Institute (GBB)

Jansen, Prof. R.C.	Bioinformatics	R.C.Jansen@rug.nl
Fraaije, Prof. M.W.	Biotechnology	M.W.Fraaije@rug.nl
Heisterkamp, Prof. S.H.	Biotechnology	S.H.Heisterkamp@rug.nl
Janssen, Prof. D.B.	Biotechnology	D.B.Janssen@rug.nl
Haastert, Prof. P.J.M. v.	Cell Biology	P.J.M.van.Haastert@rug.nl
Linskens, Dr. M.H.K.	Cell Biology/ Isotope Laboratory	M.H.K.Linskens@rug.nl
Boekema, Prof. E.J.	Electron Microscopy	E.J.Boekema@rug.nl
Croce, Prof. R.	Electron Microscopy	R.Croce@rug.nl
Oostergetel, Dr. G.T.	Electron Microscopy	G.T.Oostergetel@rug.nl
Poolman, Prof. B.	Enzymology	B.Poolman@rug.nl
Slotboom, Dr. D.J.	Enzymology	D.J.Slotboom@rug.nl
Dijkhuizen, Prof. L.	Microbial Physiology	L.Dijkhuizen@rug.nl
Maarel, Prof. M.J.E.C. v.d.	Microbial Physiology	M.J.E.C.van.der.Maarel@rug.nl
Takano, Dr. E.	Microbial Physiology	E.Takano@rug.nl
Bovenberg, Prof. R.A.L.	Molecular Cell Biology	R.A.L.Bovenberg@rug.nl
Klei, Prof. I.J. van der	Molecular Cell Biology	I.J.van.der.Klei@rug.nl
Marrink, Prof. S.J.	Molecular Dynamics	S.J.Marrink@rug.nl
Mulder, Dr. F	Molecular Dynamics	f.a.a.mulder@rug.nl
Scheek, Dr. R.M.	Molecular Dynamics	R.M.Scheek@rug.nl
Vries, Dr. A.H.	Molecular Dynamics	A.H.Vries@rug.nl
Kok, Prof. J.	Molecular Genetics	Jan.Kok@rug.nl
Kuipers, Prof. O.P.	Molecular Genetics	O.P.Kuipers@rug.nl
Veening, Dr. J.W.	Molecular Genetics	j.w.veening@rug.nl
Driessen, Prof. A.J.M.	Molecular Microbiology	A.J.M.Driessen@rug.nl
Lolkema, Dr. J.S.	Molecular Microbiology	J.S.Lolkema@rug.nl
Heinemann, Prof. M	Molecular Systems Biology	M.Heinemann@rug.nl
Broos, Dr. J.	X-ray Crystallography	J.Broos@rug.nl
Dijkstra, Prof. B.W.	X-ray Crystallography	B.W.Dijkstra@rug.nl
Terwisscha van Scheltinga, Dr. A.C	X-ray Crystallography	A.C.Terwisscha@ru
Thunnissen, Dr. A.M.W.H.	X-ray Crystallography	A.M.W.H.Thunnissen@rug.nl
Minnaard, Prof. Ir. A.J	Bio-organic Chemistry (STR)	A.J.Minnaard@rug.nl
Roelfes, Dr. J.G.	Synthetic Organic Chemistry (STR)	J.G.Roelfes@rug.nl

M-variant

Abma, Drs. A.J.	Science and Society Group	A.J.Abma@rug.nl
Bos, Drs. A.F.	Science and Society Group	Attie.Bos@rug.nl
Swart, Dr. J.A.A.	Science and Society Group	J.A.A.Swart@rug.nl
Weesie, Dr. P.D.M.	Science and Society Group	P.D.M.Weesie@rug.nl
Windt, Dr. H.J. van der	Science and Society Group	H.J.van.der.Windt@rug.nl

University Medical Center Groningen

Horst, Prof. G. ter	Biological Psychiatry	G.J.ter.Horst@med.umcg.nl
Koiter, Dr. T.R.	Biomaterials	T.R.Koiter@med.umcg.nl
Kooten, Dr. T.G. van	Biomaterials	T.G.van.Kooten@med.umcg.nl
Krom, Dr. B.P.	Biomaterials	B.P.Krom@med.umcg.nl
Mei, Prof. H.C. van der	Biomaterials	H.C.van.der.Mei@med.umcg.nl
Rakhorst, Dr. G.	Biomaterials	G.Rakhorst@med.umcg.nl
Sharma, Dr. P.K.	Biomaterials	P.K.Sharma@med.umcg.nl
Verkerke, Prof. G.J.	Biomaterials	G.J.Verkerke@med.umcg.nl
Dokkum, Dr. R.P.E.	Clinical Pharmacology	R.P.E.van.Dokkum@med.umcg.nl
Henning, Prof. R.H.	Clinical Pharmacology	R.H.Henning@med.umcg.nl
Schuringa, Dr. J.J.	Internal Medicine / Haematology	J.J.Schuringa@med.umcg.nl
Kruyt, Dr. F.A.E.	Internal Medicine-Oncology	F.A.E.Kruyt@med.umcg.nl
Faas, Dr. M.M.	Medical Biology	M.M.Faas@med.umcg.nl
Faber, Dr. K.N.	Medical Biology	K.N.Faber@med.umcg.nl
Harmsen, Dr. M.C.	Medical Biology	M.C.Harmsen@med.umcg.nl
Heeringa, Prof. P.	Medical Biology	P.Heeringa@med.umcg.nl
Kamps, Dr. J.A.A.M.	Medical Biology	J.A.A.M.Kamps@med.umcg.nl
Kroesen, Dr. B.J.	Medical Biology	B.J.Kroesen@med.umcg.nl
Luyn, Prof. M.J.A. van	Medical Biology	M.J.A.van.Luyn@med.umcg.nl
Molema, Prof. G.	Medical Biology	G.Molema@med.umcg.nl
Moshage, Prof. A.J.	Medical Biology	A.J.Moshage@med.umcg.nl
Prop, Dr. J.	Medical Biology	Jochum.Prop@med.umcg.nl
Rots, Prof. M.G.	Medical Biology	M.G.Rots@med.umcg.nl
Vos, Dr. P. de	Medical Biology	P.de.Vos@med.umcg.nl
Hoekstra, Prof. D.	Medical Cell Biology- Membrane	D.Hoekstra@med.umcg.nl
Kok, Dr. J.W.	Medical Cell Biology- Membrane	J.W.Kok@med.umcg.nl
IJzendoorn, S.C.D. van Dr.	Medical Cell Biology- Membrane	S.C.D.van.IJzendoorn@med.umcg.nl
Coppes, Dr. R.P.	Medical Cell Biology- Rad. & Stress	R.P.Coppes@med.umcg.nl
Kampinga, Prof. H.H.	Medical Cell Biology- Rad. & Stress	H.H.Kampinga@med.umcg.nl
Sibon, Prof. O.C.M.	Medical Cell Biology- Rad. & Stress	O.C.M.Sibon@med.umcg.nl
Haan, Prof. G. de	Medical Cell Biology-Stem Cell Biol.	G.de.Haan@med.umcg.nl
Hofstra, Prof. R.M.W.	Medical Genetics	R.M.W.Hofstra@med.umcg.nl
Dijl, Prof. J.M. van	Medical Microbiology	J.M.van.Dijl@med.umcg.nl
Huckriede, Dr. A.L.W.	Medical Microbiology	A.L.W.Huckriede@med.umcg.nl
Waarts, Dr. B.L.	Medical Microbiology	B.L.Waarts@med.umcg.nl
Boddeke, Prof. H.W.G.M.	Medical Physiology	H.W.G.M.Boddeke@med.umcg.nl
Copray, Dr. J.	Medical Physiology	J.C.V.M.Copray@med.umcg.nl
Eggen, Dr. B.J.L.	Medical Physiology	B.J.L.Eggen@rug.nl
Muntinga, Dr. J.H.J.	Medical Physiology	J.H.J.Muntinga@med.umcg.nl
Schuil, Dr. H.A.	Medical Physiology	H.A.Schuil@med.umcg.nl
Knibbe, Dr. M.E.	Metamedica	m.e.knibbe@med.umcg.nl
Kroese, Prof. F.	Medical Cell Biology - Immunology	F.G.M.Kroese@med.umcg.nl
Jong, Dr. S. de	Pathology and Lab. Medicine	S.de.Jong@med.umcg.nl

9 Regulations

9.1 Introduction

Dutch university education is governed by national law and local rules and regulations.

The most important of the local rules and regulations is the Teaching and Examinations Regulations [Onderwijs- en examenregeling, abbreviated OER].

The master's degree programmes are recorded in the Official Registry CROHO [Centraal Register Opleidingen Hoger Onderwijs]. The registration numbers are:

Biology	66860
Ecology & Evolution	60365
Marine Biology	60609
Molecular Biology & Biotechnology:	60612

9.2 Teaching and Examination Regulations 2010 – 2011

The Teaching and Examination Regulations for the Master's degree programmes, were not yet decreed on by the faculty council when we published this course catalogue. Before September 1, 2010 the final version will be published on www.rug.nl/fwn/informatievoor/studenten/reglementen/oer-en/index

9.3 Rules and Regulations 2010 – 2011

The Rules and regulations for the School of Life Sciences, with effect from 1 September 2010 were not yet decreed on by the faculty council when we published this course catalogue. Before September 1, 2010 the final version will be published on www.rug.nl/fwn/informatievoor/studenten/reglementen/RenR

9.4 University-wide regulations for Academic year 2010 – 2011

THE STUDENT CHARTER

The Student Charter provides an overview of the rights and obligations of both students and the University. It is based on national legislation, particularly the Higher Education and Research Act (WHW), supplemented by regulations that are specific to the University of Groningen. These latter regulations are set out in the appendices to the university-wide section of the Student Charter.

The Charter has been divided into two sections. The university-wide section describes the rights and obligations that apply to the university as a whole, such as registration and protection of rights. This section can be found on the University of Groningen website (www.rug.nl/studenten/ > Legal position > Students' charter).

The university-wide section of the Student Charter does not literally quote the articles from acts and regulations but describes them as clearly as possible. The various topics are accompanied by links to the relevant articles of the act or regulation in question.

The programme-specific sections describe the rights and obligations that apply to specific programmes, such as examinations and ECTS credit points, and which

differ from one programme to another, as well as from one faculty to another. You can consult the programme-specific section at the faculty Education Offices and in the faculty Study guides.

APPLICABILITY

The Student Charter applies to academic year 2010-2011. The university-wide section of the Student Charter is approved annually by the Board of the University and endorsed by the University Council. In the event that the Charter challenges or contradicts any legal regulations, these legal regulations will take priority.

PUBLICATION

A CD-ROM containing the Student Charter will be sent to the home addresses of students who register for a degree programme at the University of Groningen for the first time. All other students will receive a letter informing them where they can consult the Student Charter. It is also available on the internet.

THE IMPORTANCE OF THE STUDENT CHARTER

All students are expected to be familiar with the contents of the Student Charter. Not complying with the rules in the Charter may affect your rights, for example the right to financial support from the Graduation Fund.

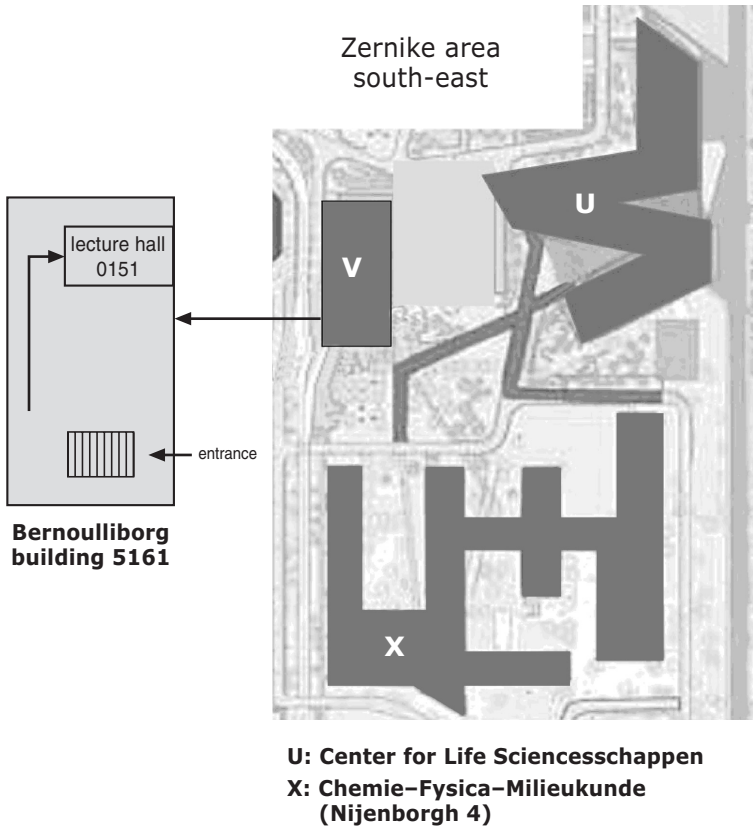
Some of these regulations may not be as hard and fast as they sound. Rules and regulations are by definition general in character, and this Student Charter is no exception. This means that the applicability of these regulations in concrete situations and individual instances is not always a predictable and straightforward matter. Moreover, rules and regulations are never static but always subject to revision. Students who have registered for the first time this year may find that the regulations that apply to them are different to those for students who have reregistered. Make sure you are provided with the right information by your faculty and/or the University Student Desk (USD) and read the Student Charter carefully!

TOPICS COVERED BY THE STUDENT CHARTER

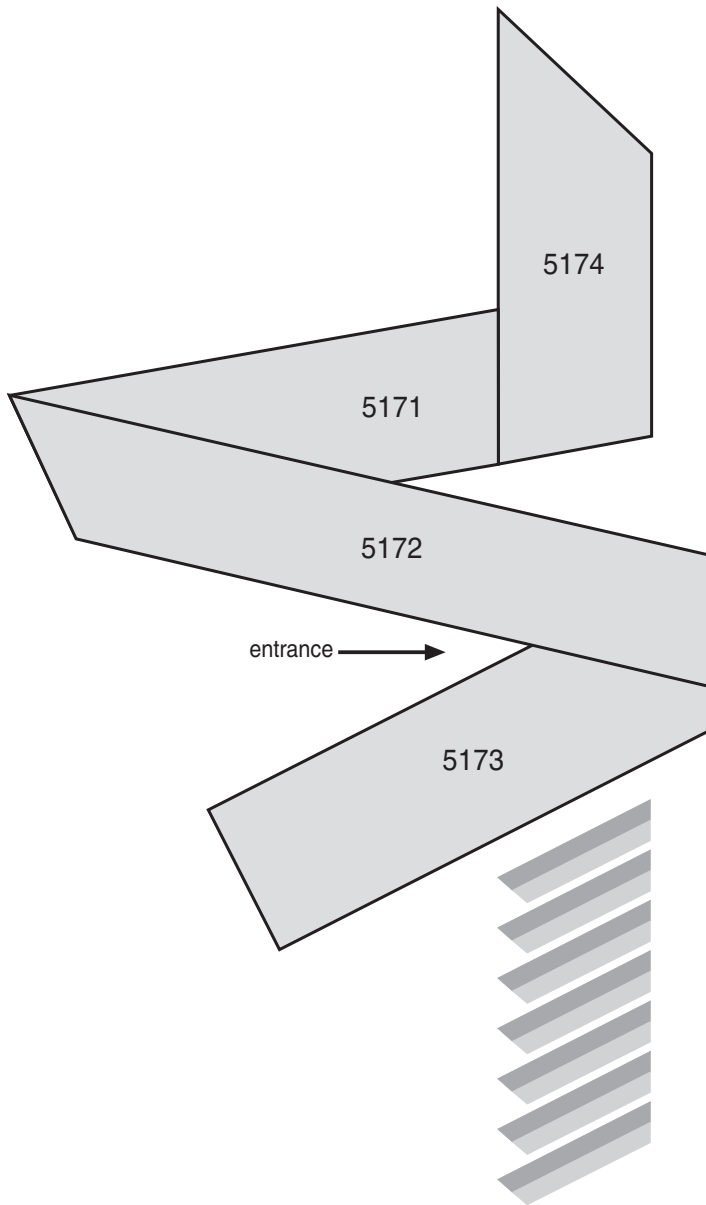
The university-wide part of the Student Charter contains further information about student rights and obligations with regard to the following topics:

- eligibility and admission requirements for university degree programmes
- registration and deregistration, payment of tuition fees
- teaching
- examinations and final assessments
- financial support in the event of force majeure or extraordinary circumstances
- participation
- rules of conduct
- protection of rights, complaints, objections and appeal procedures.

10 Locations

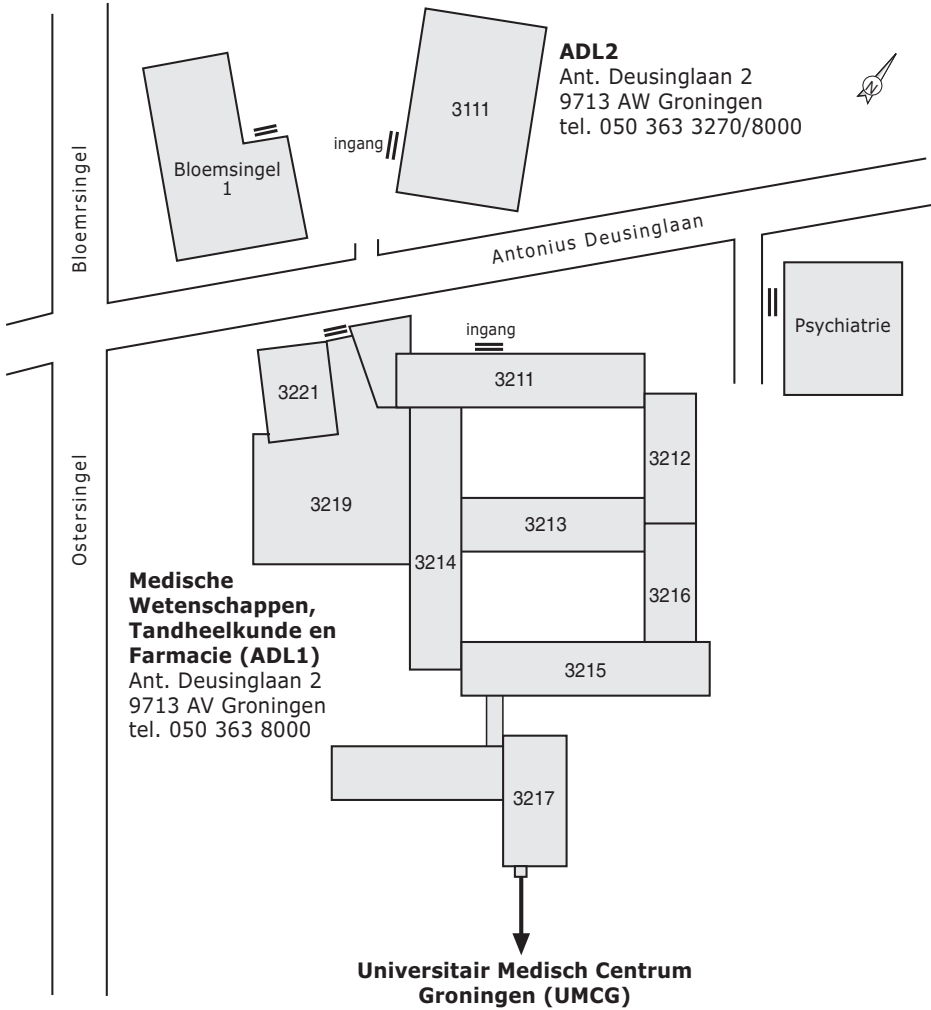


10 Locations

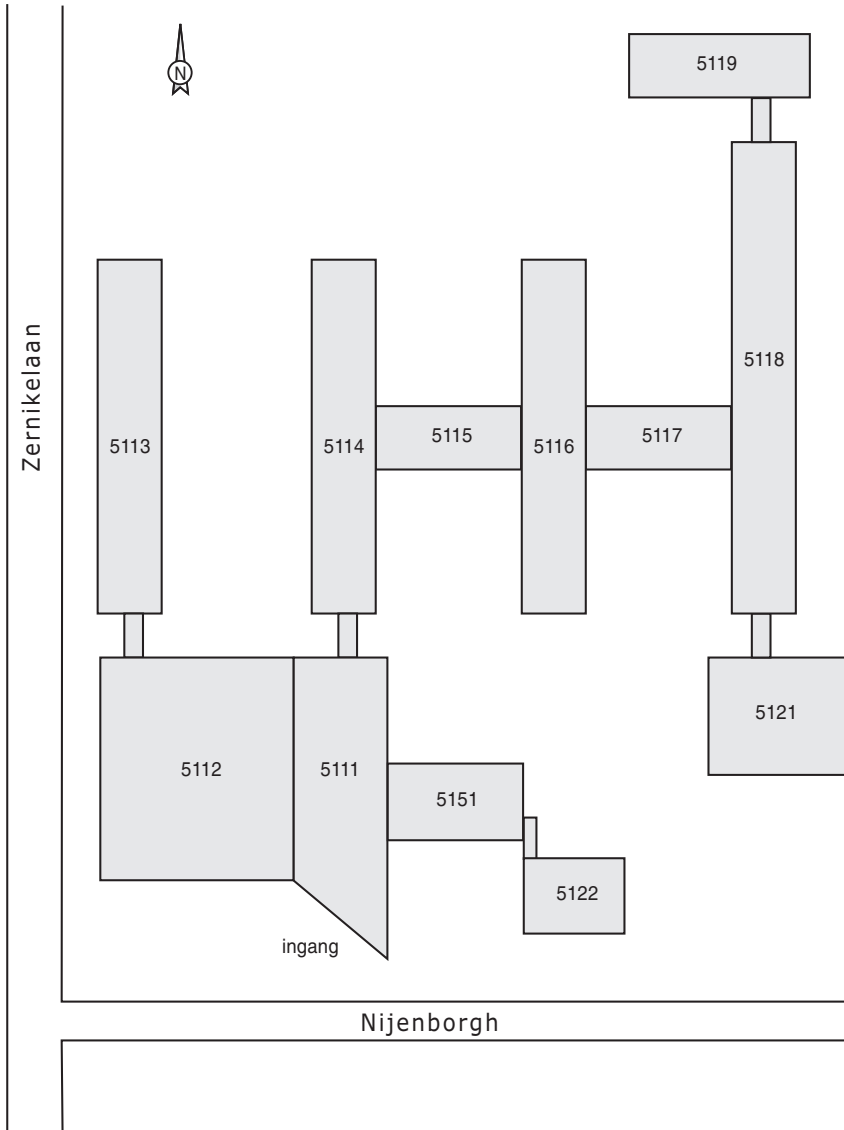


Center for Life Sciences
Nijenborgh 7
9747 AG Groningen
tel. 050 363 2021

10 Locations



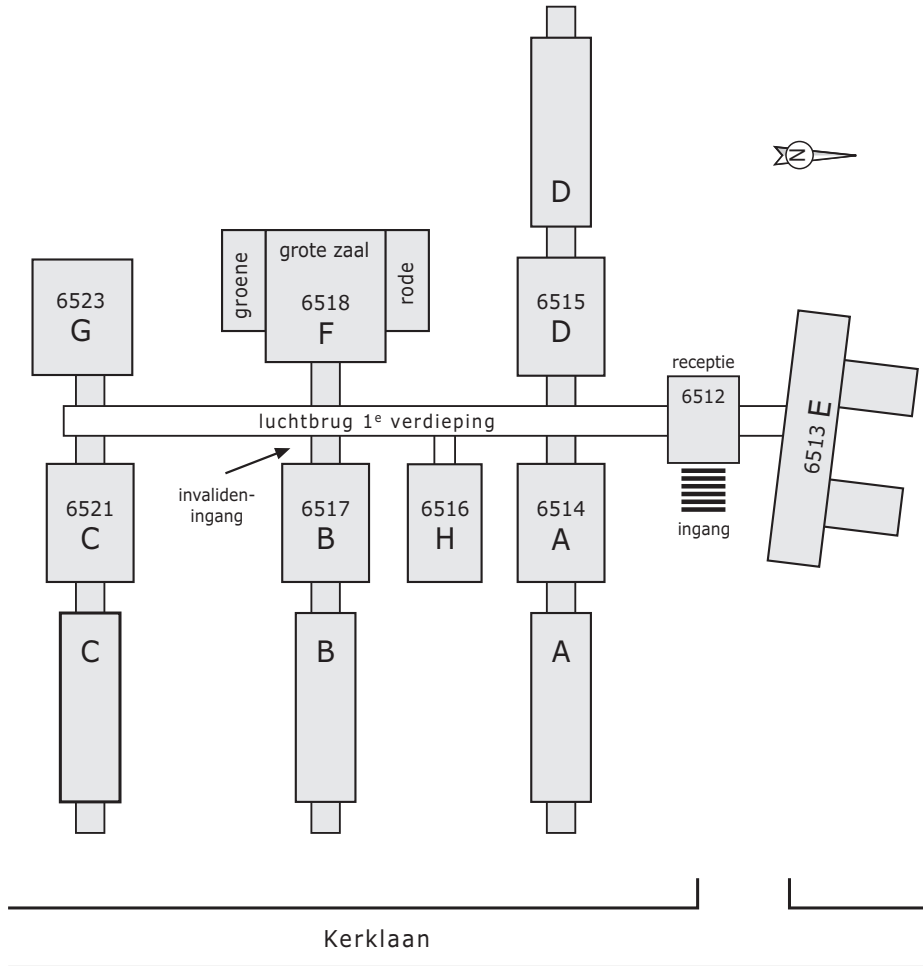
10 Locations



Chemie-Fysica-Milieukunde

Nijenborgh 4
9747 AG Groningen
tel. 050 363 4133

10 Locations



Biologisch Centrum

Kerklaan 30
Postbus 14
9750 AA Haren
tel. 050 363 2021