STUDY GUIDE
2016-2017

MASTER’S DEGREE PROGRAMMES

CHEMISTRY
CHEMICAL ENGINEERING

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
RIJKSUNIVERSITEIT GRONINGEN
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GENERAL INFORMATION

A1.1 INTRODUCTION
Welcome to the Study Guide for all degree programmes offered by the Faculty of Mathematics and Natural Sciences (FMNS). This Study Guide aims to provide students and lecturers with information about the various degree programmes. The Study Guide comprises a general section, which is identical for all FMNS degree programmes, and a programme-specific section.

The general section of this Study Guide contains a wide range of information, for example about facilities, student matters and what to do if you run into problems, whereas the degree programme-specific section discusses matters such as the study programme, study associations and important addresses.

A1.2 FACULTY ORGANIZATION
The Bachelor’s and Master’s degree programmes are offered by the Faculty of Mathematics and Natural Sciences (FMNS). FMNS is one of the largest natural sciences faculties in the Netherlands. Teaching within FMNS is organized in an Undergraduate and a Graduate School of Science. The Undergraduate School of Science organizes the teaching of Bachelor’s programmes, while the Graduate School of Science organizes the teaching of Master’s programmes and PhD projects in strong relationship with the research institutes. In general the lecturers of the programmes are researcher in one of the research institutes as well.

All Bachelor’s degree programmes within FMNS except Biology, Life Science and Technology, and Pharmacy are offered in English. All Master’s degree programmes, except Education and Communication and Pharmacy, are offered in English as well. This increases student exchange and reflects the international character of research within the faculty.

A1.3 DEGREE PROGRAMMES IN BRIEF
All FMNS degree programmes start with a three-year (180 ECTS) Bachelor’s phase, each year comprising two semesters. A completed Bachelor’s degree can be followed by a Master’s degree programme lasting at least two years (120 ECTS). Students who successfully complete an FMNS degree programme are awarded the title of Bachelor of Science (BSc) or Master of Science (MSc). In addition, some degree programmes also lead to the conferral of the Dutch ‘ingenieur’ degree, a teaching qualification or a pharmacist’s diploma.

<table>
<thead>
<tr>
<th>Bachelor</th>
<th>ECTS</th>
<th>Bachelor</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Mathematics</td>
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<td>Computing Science</td>
<td>180</td>
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<tr>
<td>Applied Physics</td>
<td>180</td>
<td>Industrial Engineering and Management</td>
<td>180</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
<td>180</td>
<td>Life science and technology *</td>
<td>180</td>
</tr>
<tr>
<td>Astronomy</td>
<td>180</td>
<td>Mathematics</td>
<td>180</td>
</tr>
<tr>
<td>Biology *</td>
<td>180</td>
<td>Pharmacy *</td>
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<tr>
<td>Chemical Engineering</td>
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<td>Physics</td>
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<tr>
<td>Chemistry</td>
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* Only offered in Dutch.
<table>
<thead>
<tr>
<th>Master</th>
<th>ECTS</th>
<th>Master</th>
<th>ECTS</th>
</tr>
</thead>
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<tr>
<td>Applied Mathematics</td>
<td>120</td>
<td>Education and Communication**</td>
<td>120</td>
</tr>
<tr>
<td>Applied Physics</td>
<td>120</td>
<td>Energy and Environmental Sciences</td>
<td>120</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
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<td>Human-Machine Communication</td>
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<tr>
<td>Astronomy</td>
<td>120</td>
<td>Industrial Engineering and Management</td>
<td>120</td>
</tr>
<tr>
<td>Behavioural &amp; Cognitive Neurosciences *</td>
<td>120</td>
<td>Marine Biology</td>
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<tr>
<td>Biology</td>
<td>120</td>
<td>Mathematics</td>
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<td>Biomedical Engineering</td>
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<td>Medical Pharmaceutical Sciences</td>
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<td>Biomedical Sciences</td>
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<td>Molecular Biology and Biotechnology ##</td>
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<tr>
<td>Computing Science</td>
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<td>Physics</td>
<td>120</td>
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<tr>
<td>Ecology and Evolution #</td>
<td>120</td>
<td>Water Technology (Joint Degree) ***</td>
<td>120</td>
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</tbody>
</table>

* Top/Research master.
** Only offered in Dutch.
*** The Joint Degree programme is offered in collaboration with other institutions skilled in this field of expertise: two other Dutch universities (Wageningen University, University of Twente) and the Technological Top Institute for Water Technology Wetsus, Leeuwarden.
# The top track Evolutionary Biology is part of the master Ecology & Evolution.
## The top track Biomolecular Sciences is part of the master Molecular Biology and Biotechnology.

**A1.3.1 Research and academic skills in undergraduate education**

**Introduction**

Since the introduction of the undergraduate and graduate educational degree-programmes at the University of Groningen in 2002, bachelor and master studies are essentially separate and independent degree-programmes. As the University of Groningen is an academic institution, the education of both graduate and undergraduate degree-programmes thus need to be thoroughly intertwined with academic research and students should be familiarized with academic research skills.

Academic skills cannot be regarded as just a separate learning pathway in academic education in which students are trained to retrieve information, communicate, reflect etc., but these skills should be fully connected to and embedded in the academic context in which they are practiced. Academic skills are thus an important precondition and a logical consequence of academic training.

Finally, research and academic skills require an academic attitude, which can be described as a positive predisposition and orientation towards an academic approach of research problems and issues. It requires the tendency to be curious and critical and to work analytical, systematic, fact-based and accurate.

**Research-based undergraduate education at the Faculty of Mathematics and Natural Sciences**

At the Faculty of Mathematics and Natural Sciences (FMNS) the education of undergraduate programmes is based on the latest academic theories and research outcomes, in the sense that these form an integral part of courses and research projects of bachelor degree-programmes. Furthermore, each undergraduate programme contains an explicit learning pathway introducing, practicing and assessing research and academic skills such as:

- Formulating adequate research goals, questions and/or hypotheses;
- Searching for, assessing and reflecting on scientific literature;
- Setup of basic research experiments, analysis of and reflection on its outcomes and drawing appropriate conclusions;
- Critical thinking, reflection, analytic attitude and capacity;
- Reflecting on research methods and research methodology;
- Communicate about research progress and outcomes (both orally and in writing);
- Cooperate in a (multi-disciplinary) team.

The educational mission of the FMNS is to train students to be able to perform scientific research independently, with a critical and academic attitude, accompanied with a clear ethical conduct, thus preparing them for an excellent starting position for an academic or professional career.

**Implementation of research-based education in curricula of FMNS undergraduate studies**

Research-based education is implemented in virtually all teaching methods used at the faculty; each with its own specific learning objectives, as exemplified below:

- Lectures: The vast majority of lecturers of the FMNS (>95%) are actively involved in academic research and thus are inspired to present the latest academic theories and research outcomes within lectures.
- Initial literature (re)search, analysis and assessment is carried out already in first year symposium type of courses. These assignment-based courses connect students closely to research groups of the FMNS, carrying out literature research linked to or relevant for these research groups.
- Practical courses, tutorials and assignments have the following objectives:
  - Practicing and familiarizing students with experimental work and skills
  - Designing and executing basic research experiments
  - Analysis of data and outcome of these experiments
  - Draw adequate conclusions from and reporting on experimental data
  - Reflect and report on experimental results and conclusions
- Science, Ethics, Technology, and Society course: In this course basic concepts of science philosophy, ethics, innovation theory, argumentation theories and policy making are introduced. This course not only introduces important philosophical and societal considerations and implications of research on society, but also aims to create awareness on ethical and societal conduct of students.
- Bachelor research thesis: During the Bachelor thesis, students are actively involved in research carried out in research groups of the FMNS. Students are challenged as much as possible to excel in their research assignment, while getting regular feedback from their supervisor(s) and other members of research groups in which they are allocated.

As the degree programme progresses, the complexity of the research pathway increases, while the students' involvement will shift from a more passive to a more active stance. Each degree-programme has realized and detailed its research learning line in its own specific way, depending on the focus, scope, and learning outcomes of the study. More details on the research learning pathway are available in the programme-specific study guide of each degree-programme or in the digital course catalogue Ocasys:

- www.rug.nl/ocasys/fwn

**A1.3.2 Erasmus programmes**

At the moment FMNS participates in two Erasmus+ (formerly known as Erasmus Mundus) Master's degree programmes:

- MEME (as part of the Master’s programme Ecology and Evolution),
  www.evobio.eu
- TCCM (as part of the Master’s programme Chemistry),
  tccm.qui.uam.es
Erasmus Mundus aims to enhance quality in higher education through scholarships and academic cooperation between Europe and the rest of the world by supporting joint programmes provided by academic consortia. Erasmus Mundus offers financial support for institutions and scholarships for individuals.

A1.3.3 Science, Business and Policy profile
The Science, Business and Policy profile (SBP-variant) is the option to choose if you are interested in the social and commercial aspects of your subject. This profile will prepare you for a career within a company or policy organization. In addition to gaining scientific knowledge, you 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, how to give and receive feedback, and how to work efficiently in groups.

The Science, Business and Policy profile is part of many of the Master’s programmes of FMNS and consists of one year of course units and research in the field of your Master’s degree programme complemented with one year of course units and internship focusing on business and policy.

For more information, consult the website: [www.rug.nl/fwn/sbp](http://www.rug.nl/fwn/sbp) and the programme-specific part of the study-guide to see whether the Science, Business and Policy profile is part of your Master's degree programme.

A1.3.4 How to become a high school teacher
Since the different trajectories for becoming a high school teacher are taught in Dutch only, this subsection is in Dutch.

Altijd al gewild...
- Voor de klas staan;
- Je kennis van het vak delen, maar ook je passie;
- Leerlingen motiveren en inspireren.

In dat geval zijn de hieronder genoemde mogelijkheden om een onderwijsbevoegdheid te behalen wellicht interessant voor jou.

**Minor Educatie**
Als je de mogelijkheid hebt om binnen je Bacheloropleiding een vrije minor te kiezen, kun je kiezen voor de Educatieve Minor. Deze minor is een intensieve fulltime opleiding van een halfjaar die - in combinatie met een Bacheloropleiding in een schoolvak - opleidt tot leraar. Je gaat drie dagen per week aan de slag op een middelbare school. Daarnaast verdiep je je bij de Lerarenopleiding in vakdidactiek, ontwikkelingspsychologie en onderwijskunde.

Als je de Educatieve Minor en je Bacheloropleiding met goed gevolg hebt doorlopen, krijg je een onderwijsbevoegdheid ‘beperkt tweedegraads’ voor de onderbouw van zowel vmbo-tl als havo-vwo.

Voor meer informatie zie:
- [www.rug.nl/lerarenopleiding/onderwijs/educatieveminor](http://www.rug.nl/lerarenopleiding/onderwijs/educatieveminor)

**Master Educatie en Communicatie**
De richting Educatie van de Master Educatie en Communicatie in de wiskunde en natuurwetenschappen biedt je een tweejarige Masteropleiding tot eerstegraadsleraar in de bovenbouw havo-vwo. Met deze opleiding verdiep je je bètkennis én leer je hoe je die kennis kunt delen, communiceren en onderwijzen.

Voor meer informatie zie:
**Master LVHO**
Behalve via een tweejarige opleiding, kun je ook eerstegraads docent worden via een éénjarige variant, Leraar Voorbereidend Hoger Onderwijs (LVHO). Voorwaarde daarvoor is dat je een Masterdiploma hebt in de richting van het schoolvak waarvoor je een eerstegraads lesbevoegdheid wilt halen. Dus als je eerst een Masteropleiding in je eigen wetenschappelijke discipline wilt volgen en daarna pas een lerarenopleiding wilt doen, kun je voor de Master LVHO kiezen. Je wordt dan eerstegraadsleraar in bovenbouw havo-vwo.

Voor meer informatie zie:
- www.rug.nl/fwn/beta-master/postmaster

**A1.4 UNIVERSITY OF GRONINGEN HONOURS COLLEGE**
If you would like an extra intellectual challenge in addition to your regular degree programme, the Honours College may be just what you are looking for. Talented and ambitious students are offered the opportunity to participate in the University of Groningen Honours College during their Bachelor’s and Master’s phases.

**A.1.4.1 Honours College during the Bachelor’s phase**
The Bachelor’s honours programme comprises an extra 45 ECTS in addition to your regular Bachelor’s programme. Within this interdisciplinary programme, 25 ECTS are intended for in-depth study and 20 ECTS for broadening your horizon. The deepening part consists of course units offered by your own faculty in which you get the opportunity to develop and experience research on a subject of your interest. The broadening part consists of course units (unrelated to your faculty), development of a range of skills and also attention is paid to your personal development.

Next to this interdisciplinary programme, the Honours College offers also a Honours programme in Philosophy.

Admission to the programme is by selection, since the number of places available is limited. The top 15% of students on the Bachelor’s degree programme are invited to apply, but students who have not received an invitation can also apply (on a ‘wild card’ basis).

For more information on the application procedure see:
- www.rug.nl/education/honours-college

Or contact the coordinator Han van der Strate:
- fwn.honours@rug.nl

**A.1.4.2 Honours College during the Master’s phase**
The Master’s honours programme is a one-year extracurricular programme with a student workload of 15 ECTS. It offers students who are able and willing to excel, the possibility to deepen their theoretical knowledge about leadership and to improve their leadership skills. This programme will provide a solid starting point for your future academic or social career and it will contribute to your personal development.

For information, see:
- www.rug.nl/education/honours-college

Or contact the coordinator Han van der Strate:
- fwn.honours@rug.nl
A.1.4.3 HTSM Honours programme

The focus of this Master's honours programme is on High Tech Systems and Materials (HTSM). The HTSM honours programme is offered by the University of Groningen – in cooperation with Philips Consumer Lifestyle, University Campus Fryslân and University of Twente – and aims to equip talented, motivated students with the knowledge and skills needed to excel at the frontiers of High Tech Systems and Materials (HTSM).

The 1.5 year HTSM honours programme worth 20 ECTS is followed in addition to the standard Master's programme. It has been developed especially for students who want to get more from their studies. The Honours programme offers intensive, small-group teaching with a group of like-minded, motivated students. Furthermore, it offers a unique opportunity to collaborate with students from different disciplines on challenging, real-life product development assignments by the industry.

For more information, see:

- [www.rug.nl/education/honours-college/htsm-masterprogramme](http://www.rug.nl/education/honours-college/htsm-masterprogramme)

Or contact the coordinator Vanessa van Hest:

- [htsm-honours@rug.nl](mailto:htsm-honours@rug.nl)
A2

STUDENT MATTERS

A2.1 ADMISSION TO THE PROGRAMME

In order to be able to participate in course units and examinations, you must be registered at the University of Groningen as a student of a certain degree programme. Registration for a programme is done via Studielink (www.studielink.nl). You must reregister every year. Please contact the University Student Desk if you have any questions concerning your registration.

Practical information, such as application procedures, can be found on the University website. The University website can also be consulted for the top programmes and the Erasmus Mundus deadlines.

International students please look at:
- www.rug.nl/fwn/fmns-programme
- www.rug.nl/education/international-students/application-procedure

Dutch students please look at:
- www.rug.nl/fwn/beta-studie
- www.rug.nl/education/nederlandse-studenten/inschrijven/

For international students, sufficient proficiency in English (a minimum IELTS test score of 6.5 or a TOEFL test score of 580 (paper-based)) is required for the English taught programmes and sufficient proficiency in Dutch (NT2-II) is required for the Dutch taught programmes.

A2.1.1 Admission to bachelor’s programmes

In case you have a Dutch diploma that according to Dutch higher education law gives entry to the degree programme of your choice, admission is automatic and is handled by Studielink:
- www.studielink.nl

In all other cases (e.g. when you have a non-Dutch diploma or a Dutch diploma that does not give automatic access to the degree programme), besides registering through Studielink, you have to go through an admission procedure in which the Admission Board BSc Programmes of FMNS based on information provided by you, decides whether or not you meet the admission requirements of the programme of your choice.

A2.1.2 Admission to master’s programmes

Students can be admitted to a Master’s degree programme once they have successfully completed a related Bachelor’s degree programme at the University of Groningen.

Students with a 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 Admissions Board. The Admissions Board will check whether you have the appropriate qualifications. In case of a Bachelor’s degree from a foreign university after registration in Studielink you will be contacted by the Admissions Office who will provide you with information on how to proceed with the admissions process. In case of a Bachelor’s degree from another Dutch university please contact the relevant academic advisor for information on how to proceed with the admissions process.
Pre-master programme
In certain cases a pre-master programme is required for Dutch students with a partially suitable Bachelor of Science or a suitable Bachelor's degree in Applied Sciences (HBO). For more information and assistance with applying ask the relevant academic advisor.

A2.2 ACADEMIC YEAR
The general academic year overview for FMNS is set out on the next page. The course units offered by the Life Science programmes are offered in blocks. Each block takes three weeks. During a block a student is engaged in one course unit. The course units offered by the other degree programmes are offered in periods of ten weeks (eight weeks of classes followed by two weeks of exams). A student is in general engaged in three course units during a period.

Some course units, for example for the degree programmes in Artificial Intelligence and Industrial Engineering and Management, are offered by other faculties. As their academic year overviews may differ from the one set out in the schedule presented here, for these course units you should consult the timetables on the web or the programme-specific part of this Study Guide.

Information about timetables and national holidays can be found via the following website:
- rooster.rug.nl
### Academic calendar 2016–2017

<table>
<thead>
<tr>
<th>Week Nr.</th>
<th>Start &amp; end date</th>
<th>Life Science degree programmes</th>
<th>Non-life Science degree programmes</th>
<th>Remarks</th>
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<tr>
<td>36</td>
<td>mo. 05-09-16 - fri. 09-09-16</td>
<td>L1</td>
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<tr>
<td>37</td>
<td>mo. 12-09-16 - fri. 16-09-16</td>
<td>L2</td>
<td>L2</td>
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<td>38</td>
<td>mo. 19-09-16 - fri. 23-09-16</td>
<td>L3/E</td>
<td>L3</td>
<td>L3/E: lectures &amp; exams</td>
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<td>39</td>
<td>mo. 26-09-16 - fri. 30-09-16</td>
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<td>40</td>
<td>mo. 03-10-16 - fri. 07-10-16</td>
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<td>41</td>
<td>mo. 10-10-16 - fri. 14-10-16</td>
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<td>42</td>
<td>mo. 17-10-16 - fri. 21-10-16</td>
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<td>L3/R**</td>
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<td>48</td>
<td>mo. 28-11-16 - fri. 02-12-16</td>
<td>L4</td>
<td>L4/R**</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>mo. 05-12-16 - fri. 09-12-16</td>
<td>L5</td>
<td>L5/R**</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>mo. 12-12-16 - fri. 16-12-16</td>
<td>L6/E</td>
<td>L6</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>mo. 19-12-16 - fri. 23-12-16</td>
<td>L7</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>52–1</td>
<td>mo. 26-12-16 - fri. 06-01-17</td>
<td>Vacation</td>
<td>Vacation</td>
<td>Christmas and New Year</td>
</tr>
<tr>
<td>2</td>
<td>mo. 09-01-17 - fri. 13-01-17</td>
<td>L7</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>mo. 16-01-17 - fri. 20-01-17</td>
<td>L8</td>
<td>L8 (Resits 1.1)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>mo. 23-01-17 - fri. 27-01-17</td>
<td>L9/E</td>
<td>Examinations 1.2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>mo. 30-01-17 - fri. 03-02-17</td>
<td>Resits 1.2</td>
<td>Resits 1.1**</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>mo. 06-02-17 - fri. 10-02-17</td>
<td>L1</td>
<td>L1 (Resits***)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>mo. 13-02-17 - fri. 17-02-17</td>
<td>L2</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>mo. 20-02-17 - fri. 24-02-17</td>
<td>L3/E</td>
<td>L3/R**</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>mo. 27-02-17 - fri. 03-03-17</td>
<td>L4</td>
<td>L4/R**</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>mo. 06-03-17 - fri. 10-03-17</td>
<td>L5</td>
<td>L5/R**</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>mo. 13-03-17 - fri. 17-03-17</td>
<td>L6/E</td>
<td>L6</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>mo. 20-03-17 - fri. 24-03-17</td>
<td>L7</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>mo. 27-03-17 - fri. 31-03-17</td>
<td>L8</td>
<td>L8 (Resits 1.2)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>mo. 03-04-17 - fri. 07-04-17</td>
<td>L9/E</td>
<td>Examinations 2.1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>mo. 10-04-17 - th. 13-04-17</td>
<td>Resits 2.1</td>
<td>Resits 1.2**</td>
<td>Fri. 14-04 Good Friday</td>
</tr>
<tr>
<td>16</td>
<td>tu. 18-04-17 - fri. 21-04-17</td>
<td>L1</td>
<td>L1 (Resits***)</td>
<td>Mo. 17-04 Easter Monday</td>
</tr>
<tr>
<td>17</td>
<td>mo. 24-04-17 - fri. 28-04-17</td>
<td>L2</td>
<td>L2</td>
<td>Th. 27-04 Kings Day</td>
</tr>
<tr>
<td>18</td>
<td>mo. 01-05-17 - th. 04-05-17</td>
<td>L3</td>
<td>L3/R**</td>
<td>Fr. 05-05 Liberation Day</td>
</tr>
<tr>
<td>19</td>
<td>mo. 08-05-17 - fri. 12-05-17</td>
<td>L4/E</td>
<td>L4/R**</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>mo. 15-05-17 - fri. 19-05-17</td>
<td>L5</td>
<td>L5/R**</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>mo. 22-05-17 - fri. 26-05-17</td>
<td>L6</td>
<td>L6</td>
<td>Th. 25-05 Ascension Day</td>
</tr>
<tr>
<td>22</td>
<td>mo. 29-05-17 - fri. 02-06-17</td>
<td>L7/E</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>tu. 06-06-17 - fri. 09-06-17</td>
<td>L8</td>
<td>L8</td>
<td>Mo. 05-06 Whit Monday</td>
</tr>
<tr>
<td>24</td>
<td>mo. 12-06-17 - fri. 16-06-17</td>
<td>L9</td>
<td>L9 (Resits 1.2)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>mo. 19-06-17 - fri. 23-06-17</td>
<td>L10</td>
<td>Examinations 2.2</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>mo. 26-06-17 - fri. 30-06-17</td>
<td>L11/E/R</td>
<td>Resits 2.1**</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>mo. 03-07-17 - fri. 07-07-17</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>mo. 10-07-17 - fri. 14-07-17</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>29–35</td>
<td>mo. 17-07-17 - fri. 01-09-17</td>
<td>Vacation</td>
<td>Summer holidays</td>
<td></td>
</tr>
</tbody>
</table>

L: lectures E: exams R: resits;  
* For Artificial Intelligence courses the resits are scheduled in the last week of the following block.  
** For Computing Science courses the resits are scheduled either in week 3, 4, 5 of the following block or at the end of the next exam period.  
*** For some Non-Life Sciences courses (mainly IEM and (Applied) Physics) the resits will take place in the first lecture week of the following block.
A2.3 FINANCIAL MATTERS
The University Student Desk (USD, see C2.2) provides information about registration procedures, tuition fees and everything you need to do to ensure that your registration becomes and remains valid. They also provide students who have paid their fees and have registered as students at the University of Groningen with a University Pass, the so called RUG-pass.

A2.3.1 Tuition fees
Information regarding tuition fees can be found on the website:
  • myuniversity.rug.nl/infonet/studenten/inuitschrijving/collegegeld/
International students can find information on tuition fees on the following website:
  • www.rug.nl/education/international-students/financial-matters
You can also contact the USD for further information.

A2.3.2 Student finance – DUO grants
For more information about Student Finance and grants (and the changes as of 1 September 2015 in this system) for Dutch students, please contact the Dienst Uitvoering Onderwijs (DUO) Groningen office:
  • www.duo.nl

A2.3.3 Study costs
The University of Groningen has a policy on study costs. The policy aims to control costs so that the study cost component does not exceed the 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 2016-2017 is € 740,-. Each programme phase has a cost ‘ceiling’ (standard sum x length of programme phase, i.e. propaedeutic, bachelor, master, major, minor).

Sometimes it is not possible to avoid exceeding 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 other arrangements may be possible. Students can obtain information on the cost policy at www.rug.nl/insandouts or Frequently asked questions on /myuniversity. They can also visit the University Student Desk or their academic advisor.

A2.4 REGISTRATION FOR COURSE UNITS AND EXAMS
Registration for course units and exams is compulsory and should be completed in time and is done via ProgRESS WWW:
  • progRESSwww.nl/rug

- Timely registration for course units is considered to be registration at least 4 weeks before the period the relevant course unit starts in.
  • Registration for a course unit obliges the registered person to appear for the first session of the course unit.
  • ProgRESS WWW does not allow you to register for more than four courses in a period. In case you want to register for more courses in a period please contact your academic advisor.
  • Please deregister for a course unit in case you decide not to attend.

- Registration for written examinations is coupled to the registration for course units! Students are responsible for a timely registration at least one week before the date of the exam:
  • In case you attend a (re-)exam you need to be present at the start of the (re-)exam.
- In case you register for a course unit you will automatically be registered for the exam.
- In case you fail the exam you will automatically be registered for the re-exam.
- It is possible to register separately for an exam or re-exam, i.e. you can register for a (re-)exam without registering for the course.
- Despite the automatic exam registration the student remains responsible for being properly registered for (re-)exams.
- **Please deregister for a (re-)exam in case you decide not to attend.** There is an opportunity to sign out until at least 1 week before the date of the (re-)examination.

**Note:** Some degree programmes, for example Artificial Intelligence and Industrial Engineering and Management, include a lot of course units offered by other faculties. Different registration procedures apply to these course units! Please check the programme-specific section of this Student Handbook for the registration deadlines for these course units, or contact the Education Office of the relevant degree programme or faculty.

You can always contact the student information desk of the faculty that offers the course unit, i.e. the Education Support Desk (see Section A3.1.1) for courses offered by the Faculty of Mathematics and Natural Sciences, if you have trouble registering. The Board of Examiners may grant permission to take a course unit or examination, even when a student is not properly registered, in special cases of force majeure. Please contact the academic advisor for more information.

**Coupling between ProgRESS WWW and Nestor**

Nestor is the electronic learning environment of the University of Groningen (see Section A4.3.6) and is used by the lecturer of a course to provide course material (like slides, reader, exercises) and post announcements.

Registration in ProgRESS WWW and enrolment in a Nestor course are coupled:

- Registration in ProgRESS WWW for a course or exam automatically results in enrolment in the corresponding Nestor course.
- Enrolment in a Nestor course does not mean you are allowed to participate in the course itself, therefore you need to be registered in ProgRESS WWW for the course.
- If you are planning a resit only, please do not register in progress for the whole course unit (including practicals and or group assignments) but send a request to be admitted to Nestor to have access to the learning environment of the course unit.

<table>
<thead>
<tr>
<th>Registered/access in</th>
<th>I have access to the course in Nestor</th>
<th>I am allowed to participate in the course</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProgRESS WWW</td>
<td>Course</td>
<td>Yes (if available)</td>
</tr>
<tr>
<td>ProgRESS WWW</td>
<td>Exam</td>
<td>Yes (if available)</td>
</tr>
<tr>
<td>Nestor</td>
<td>Course</td>
<td>Yes (if available)</td>
</tr>
</tbody>
</table>
A2.5 CREDIT POINTS AND MARKING SYSTEM

University degree programmes comprise several course units. Each course unit is awarded a number of ECTS credit points (ECTS: European Credit Transfer and Accumulation System). ECTS is an EU standardized system for measuring student workload 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.). 60 ECTS credit points represent one year.

A2.5.1 Marking system

After an exam is completed, the results are administered in the automated results registration system (ProgRESS WWW). A list of the results you have achieved can be found on the internet:

- progRESSwww.nl/rug

Please contact the Education Support Desk (ESD) immediately if you find an error in your registered marks.

If an official results transcript is required, a printout can be requested from the Education Support Desk (ESD, see Section A3.1.1).

In general, each course unit is examined either by an examination (written or oral), a written assignment, or a presentation. The Dutch marking scale ranges from 1 (lowest) to 10 (highest). 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

A mark below 6 requires the course unit to be repeated until a 6 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, taking into account the student workload. Alternatively, an assessment can be registered as pass or fail only. This type of assessment is used for practicals and also for the registration of results from abroad (based on the transcript of records of the foreign University).

A2.5.2 Fraud

Fraud and plagiarism are not accepted at this University or anywhere else in the academic community. In all cases where plagiarism is found or suspected, the Board of Examiners will act accordingly. If the Board decides that plagiarism has occurred, it will impose a sanction in accordance with the Rules and Regulations (see Section C1.3). In general, this will result in the student being excluded from participation in examinations or other forms of testing for the relevant course unit for the current academic year.

A2.6 BINDING STUDY ADVICE: THE BSA SYSTEM

A binding (negative) study advice is a binding decision regarding the continuation of the Bachelor’s degree programme.

To be allowed to continue your Bachelor’s degree programme, you must have earned at least 45 ECTS credit points by the end of your first year and have gained your propaedeutic certificate by the end of your second year.

If you fail to satisfy these requirements, you will be issued a binding (negative) study advice. This means you are not allowed to continue your degree programme and will not
be allowed to register for the same Bachelor’s degree programme for the next two years. You can, however, register for other degree programmes. However, a negative BSA for a certain degree programme may also apply to a cluster of related degree programmes (see the website below for the clusters within FMNS).

If you decide in your first year to deregister for your degree programme before the 1st of February, it is possible to register in a later academic year for the same degree programme again, thereby avoiding a binding study advice in the academic year of deregistration.

If you fail to satisfy the BSA requirements due to personal circumstances, you can apply for an adapted BSA threshold. Please contact the academic advisor as soon as the circumstances arise.

More information about the BSA system can be found on:
- myuniversity.rug.nl/infonet/studenten/bindend-studie-advies/

A2.7 STUDY DELAY AND GRADUATION FUND (PROFILERINGSFONDS)
If circumstances beyond your control affect your progress during your studies, you may be eligible for financial assistance from the Graduation Fund (Profileringsfonds). The conditions are set out in the regulations pertaining to the Fund:
- myuniversity.rug.nl/infonet/studenten/profileringsfonds/

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 academic 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 academic advisor will direct you to a student counsellor if your delay amounts to or is expected to amount to more than 15 ECTS credit points. 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 academic advisor, you must contact a student counsellor immediately, even if you have not been told to do so by the academic advisor. You must follow the advice of and the agreements made with the academic 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 apply late you will not receive any financial compensation.
A2.8 GRADUATION AND APPROVAL OF STUDY PROGRAMME
The degree application comprises two steps:
1. The approval of your study program by the Board of Examiners.
2. The actual degree application ultimately resulting in the graduation ceremony.

Starting the application process takes place by means of registration in ProgRESS WWW the same way you register for a module, exam or re-sit, and subsequently composing your study program in ProgRESS WWW (see Section A4.3.7).

In ProgRESS WWW you go to:
Enrolments RuG > Mathematics and Nat. Sciences > (Under)Graduate school > BSc /MSc “Program” > Aanvraag examen BSc/MSc “Program”
Once you have submitted your programme the Board of Examiners will decide about approval of your programme.

ProgRESS WWW detects when you have finished all modules of your approved study programme. The administration will than start the process of the degree application. You can follow the progress of this process in the degree application module in ProgRESS WWW.

Information regarding ceremony dates can be found on the Student Portal or the programme-specific section of the Study Guide.

On request, students who drop out can receive a statement of their academic record including the course units passed.

Honours predicate
In some cases a student will be awarded an honours predicate, Cum Laude or Summa Cum Laude. The specific guidelines for this predicate can be found for the Bachelor’s programmes in the Teaching and Examination Regulations (see Section C1.2) and for the Master’s programmes in the Rules and Regulations of the Board of Examiners (see Section C1.3).

A2.9 OBJECTION AND APPEAL PROCEDURES
If you have a complaint, or if you disagree with a certain decision, you can voice your concerns in an informal and/or a formal way:
- **Informal** - The quickest way to solve a problem is to talk to the person or body with whom you have the problem. If the relationship or atmosphere between you and the person in question does not allow for informal talks, you can ask your academic advisor or the SSC student counsellors for advice.
- **Formal** - You can lodge an official complaint, objection or appeal if there are degree programme-related matters that you are not happy with or do not agree with.
A2.9.1 Board of Appeal for Examinations (CBE)
The Board of Appeal for Examinations (CBE) is an independent body where administrative appeals can be lodged against individual decisions by Boards of Examiners, examiners and Admissions Boards on the basis of Article 7.60 of the Higher Education and Research Act (WHW). This may concern decisions about subjects specifically related to teaching, such as:
- Marking of examinations and final assessments;
- Admission to examinations;
- Admission to a degree programme;
- Assessment of the entrance examination (colloquium doctum);
- Establishing the number of ECTS credits earned;
- Granting of exemptions.

For more information, see the Student Portal.

Appeals can be submitted to the Central Portal for the Legal Protection of Student Rights (CLRS, see A2.9.3).

A2.9.2 Complaints, concerning sexual harassment, aggression, violence and discrimination (SIAGD)
Complaints concerning, for example, sexual harassment, aggression, violence or discrimination should be reported to the University of Groningen Confidential Advisor. The Confidential Advisor is available to both students and staff members. The Confidential Advisor has an independent position within the University and all consultations are treated confidentially. For more information, see the Student Portal.
If you feel you are the victim of unwanted behaviour, you can also submit a written complaint to the Central Portal for the Legal Protection of Student Rights (CLRS, see A2.9.3). All documents related to such complaints are treated strictly confidentially.

A2.9.3 Central Portal for the Legal Protection of Student Rights (CLRS)
Appeals against individual decisions by Boards of Examiners or official complaints concerning sexual harassment, aggression, violence or discrimination can be submitted in writing to the Central Portal for the Legal Protection of Student Rights at the following address:

CONFIDENTIAL University of Groningen
Central Portal for the Legal Protection of Student Rights (CLRS)
P.O. Box 72
9700 AB Groningen
the Netherlands

Every complaint will be treated as confidential. More information can be found on:

- www.rug.nl/education/laws-regulations-complaints/complaintobjectionappeal

A2.10 COMMITTEES
The Faculty of Mathematics and Natural Sciences has a number of managerial bodies, including:

A2.10.1 Board of Examiners
The Board of Examiners [Examencommissie, EC] draws up rules related to the practical aspects of examinations, such as how exams may be taken, what the criteria for a ‘cum laude’ predicate are and how registration is arranged. In addition to these general rules, the Board of Examiners is also responsible for individual matters such as approval of individual study programmes, granting exemption from course units, admission to course units to which you would normally not be admitted, assessing force majeure in
situations related to registration and examinations and investigating potential cases of fraud. The Board of Examiners is also your point of call for complaints about examinations and marking.

Each degree programme has its own Board of Examiners, which is only authorized to rule in matters concerning that specific degree programme. Some degree programmes include course units offered by other degree programmes. The Board of Examiners for the degree programme setting the examinations is authorized to assess the examinations, deal with any complaints and decide upon requests for alternative exam regulations. Course units taught by other degree programmes or faculties are the responsibility of the Board of Examiners of the degree programme in question.

The Board of Examiners comprises at least of one member who is a lecturer in the degree programme and one member from outside the programme. Please see the programme-specific section of the Study Guide for more information and a list of members of the relevant Board of Examiners.

A2.10.2 Programme Committee
The Programme Committee [PC, Opleidingscommissie, OC] handles all important matters regarding a degree programme, with the exception of individual problems. This committee directly advises the Faculty Council with regard to the content of the Teaching and Examination Regulations [OER, onderwijs- en examenregeling]. Additionally, the Committee is responsible for the evaluation of course units and the evaluation of the degree programme. It also issues solicited and unsolicited advice to the Programme Director about educational issues. A Programme Committee consists of both staff members and students. Information on the Programme Committee members for your degree programme can be found in the programme-specific section of the Study Guide.

Student platforms and Bètastuf
Most degree programmes also have a student platform, in which students from all cohorts meet to discuss their degree programme. This way, problems can be identified at an early stage and possibly even resolved before the end of the course unit in question. Student representatives from the Programme Committees (OCs) also attend these meetings, which may therefore also serve as input for the OCs. Please check the programme-specific section of the Study Guide for more information about your degree programme’s student platform and how to contact it. Bètastuf is the overarching organisation for all the student-representation in FMNS.

See for more information:
• www.rug.nl/fwn/organization/betastuf

A2.10.3 Admission Board BSc Programmes
Students who apply for admission to a Bachelor’s degree programme based on prior education that according to Dutch higher education law does not give entry to the degree programme of your choice (e.g. a non-Dutch diploma, Dutch diploma without the proper profile, or Dutch propaedeutic certificate of a university of applied sciences) will be assessed by the Admission Board BSc Programmes (CBT, Commissie Bijzondere Toelating). For more information about the admissions procedure, see Section A2.1.

Contact information can be found on the FMNS website:
• www.rug.nl/fwn/beta-studie/praktisch/toelating-inschrijving/
A2.10.4 Admissions Board for the Master’s programme
Students can be admitted to a Master's degree programme once they have successfully completed a related Bachelor's degree programme at the University of Groningen. Students with a 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 Admissions Board of the programme. Each (cluster of) Master's degree programmes has its own Admissions Board. For more information about the admissions procedure, see Section A2.1.

A2.10.5 Faculty Board
The Faculty Board (Faculteitsbestuur, FB) is responsible for the management and administration of the Faculty, and for the supervision of the quality of the teaching and research. The FB also draws up the budgets and allocates the staff.

After each meeting, the Faculty Board sends an overview of the topics discussed and decisions taken to the Faculty Council, the Director of Undergraduate and Graduate Studies and the directors of the research institutes for their information, unless the interests of the University or of the involved persons preclude this.

A2.10.6 FMNS Faculty Council
The Faculty Council [Faculteitsraad] is FMNS's consultative participation body. It has staff and student members and is authorized to discuss the general affairs of the Faculty with the Faculty Board, to make suggestions and to voice its opinions. The Faculty Council has rights of approval and rights to advise the Faculty Board about matters that are specifically relevant to the Faculty. In addition, the Faculty Council has rights of approval with regard to the Faculty Regulations and a large part of the Teaching and Examination Regulations. Where the Faculty Board has the right to take certain measures independently, the staff section of the Faculty Council has rights to advise as well as rights of approval.

More information can be found on the website:
- www.rug.nl/about-us/organization/administrative/participation/faculty-councils/faculty-council-fwn
A3
STUDENT SUPPORT

A3.1 EDUCATION SUPPORT CENTRE
The staff of the FMNS Education Support Centre (ESC) provides support to the teaching organization. Staff members are academic advisors, degree programme coordinators, schedulers, exchange coordinators, student administration, and secretaries. Their support involves:
- Providing information for students and prospective students about the teaching programme;
- Helping students with study-related problems;
- Organizing registration for course units and examinations;
- Administering examination results and degree certificates;
- Compiling lecture and examination timetables;
- Providing information about study abroad and financial support;
- Formulating and implementing education policy, etc.;
- Conducting and processing surveys in the field of teaching quality assurance;
- Supporting the Programme Committees and Board of Examiners.

The ESC has offices at Zernike and at the A. Deusinglaan (ADL) location. Although FMNS students are welcome to visit both locations if they have general questions, programme-specific knowledge is mainly concentrated at the location where the students follow most of their course units.

A3.1.1 Education Support Desk
The Education Support Desk (ESD) is the ESC’s front office. This is where students can turn to with questions and comments about the teaching organization. Please feel free to contact the ESD via e-mail or phone, or drop by during opening hours.

You may visit the ESD for the following kind of matters:
- To hand in programme-related forms or documents;
- To get a certified transcript of records (free of charge);
- In case of questions about the processing of grades in ProgRESS WWW;
- In case of enrolment problems in ProgRESS WWW;
- If you have questions about graduation (after reading the relevant information on this Nestor page).

ESD Zernike
Location: Bernoulliborg, Nijenborgh 9, building 5161, first floor
Opening hours: 10:30 – 12:00 (all week days)
13:00 – 15:00 (not on Wednesday and Friday)
Telephone: (050) 363 4422
(between 9.00 – 12:00 and 13:00 – 16.00)
E-mail: esc.fwm@rug.nl
ESD ADL
Location: UMCG, Antonius Deusinglaan 1, building 3214, ground floor
Opening hours: 12:00 – 14:00
Telephone: (050) 363 3315 or (050) 363 3343
(between 9:00 – 12:00 and 13:00 – 16:00)
E-mail: esc.fwn@rug.nl

For detailed information about closing days (for instance due to holidays) see the Student Portal.

A3.1.2 Academic Advisor
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 academic advisor [studieadviseur] is to assist students in finding solutions to any problems encountered while studying. In practice, this concerns matters like the choice of degree programme, study pace or an improvement in study methods. You can visit the open office hours of an academic advisor or make an appointment via the Education Support Desk or using youcanbook.me. For an overview of the academic advisors see the Nestor page of the Education Support Centre and for the contact information of the academic advisor relevant for you see the programme-specific section of the Study Guide.

During the academic year academic advisors organize meetings to support students with certain aspects of their study. In the Thesis Support Group students, who have problems keeping pace when working on a large research project, meet weekly under the supervision of an academic advisor. They discuss their progress and set goals for the coming week. Similarly, other groups of students meet on a regular basis to increase their general study progress.

Problems of a more general nature (e.g. the financial consequences of study delay) are often dealt with by consulting the University student counsellors. You can also discuss social matters with the academic advisor if you need a confidant for personal problems. In some of these cases the academic advisor will recommend the more specialized assistance provided by the Student Service Centre (SSC, see section A3.4.2).

Students can book their own appointment with an academic advisor, using an online booking system (https://youcanbook.me), for which the specific URL can be found at Nestor.

A3.1.3 Degree Programme Coordinator
The degree programme coordinator [onderwijscoördinator] supports the teaching process within the programme, is the secretary of the Board of Examiners and advises the Programme Committee. Consult the contact information in the programme-specific section of the Study Guide if you wish to contact the degree programme coordinator.

A3.2 STUDYING WITH A PERFORMANCE DISABILITY
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.) permitting exceptions from the Teaching and Examination Regulations (see section C1.2);
- Extracurricular individual examinations;
- Different examination time or place;
- Relaxation of study progress rules;
- Replacement assignment for compulsory lectures or practical’s, etc.

In consultation with the academic 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.

**Please inform as soon as possible the academic advisor in case you have a performance disability.**

**A3.3 STUDYING ABROAD**

Several FMNS Bachelor’s and/or Master’s degree programmes offer students the opportunity to gain academic and social experience abroad. Next to attending regular courses at a host university, you can also opt for other projects, such as: work placements, minors (3rd year BA) or MA research projects. Please ask your academic advisor whether an exchange period or a project fits in your programme. If your academic advisor finds your project feasible, go to the Exchange Office (see A3.3.2) who will tell you how to proceed.

**A3.3.1 Organizing study period abroad**

**Where can you go?**

If you want to study at another European university, you can be hosted at the following Erasmus partner universities of the FMNS Faculty: check the Student Portal.

**Note:** contact the Exchange Office (Bernoulliborg) to know whether you are eligible for an Erasmus exchange period and to check which places are still available.

If you would like to spend a study period outside Europe, you could leave within the framework of the Multi-Faculty Exchange (MFE). The RUG has university-wide agreements with some highly ranked universities worldwide, see the Student Portal.

Bear in mind that the deadline for MFE is extremely early (last year: February 1st) and that many documents (as an official language test) should be handed in by then. The deadline for the academic year 2015-16 was not known at the moment this study guide was prepared.

In case you wish to conduct an internship, be aware that you can go anywhere in Europe (with an Erasmus funding) or outside Europe (with a Marco Polo scholarship). For information about funding and/or eligibility, contact the Exchange Office.

**How can you finance your study period abroad?**

The easiest way to finance a study period or a work placement abroad - within Europe - is with an Erasmus grant. This scholarship entitles you to an allowance of 12 months, which you can use in several (interrupted) times. For destinations outside Europe (be it for a study programme or for an internship), you can apply for a grant from the University’s Marco Polo travel fund. Know that a combination of both these grants (Erasmus and Marco Polo) is not possible. For more details about these grants or any additional funding, please contact the Exchange Office (see A3.3.2).

**Are you eligible for a grant?**

To be eligible for an Erasmus or Marco Polo grant, you must at least have completed the first year Bachelor’s degree programme.

Besides, the following conditions apply to both grants:

- Internship duration: min. 2 months/ max. 12 months.
- Study period: min. 3 months/ max. 12 months.
**Which requirements must your study programme abroad meet?**  
Before your departure, the Board of Examiners must approve the study programme you compiled for your study period at the hosting university. Be aware that, without this approval, your results will not be included in your list of marks after your return.

**How do you prepare your stay abroad?**  
There are a number of things to arrange before you can go abroad: the application procedure at the host universities, a housing request, etc.  
Keep in mind that hosting universities all have different application deadlines. The deadlines for the grants also vary according to your dates of departure and arrival.  
This being said, remember that you first have to be officially nominated as an exchange student by the Exchange Office before you can start applying at the host university.

**When should you start preparing your stay abroad?**  
For an Erasmus exchange, it is recommended to contact the Exchange Office at least 8 months before the start of the semester abroad.  
For a MFE application, please pass by 4 months before the deadline.

**A3.3.2 Exchange Office**  
The Exchange Officers for FMNS are:  
- Henriëtte Mulder (at Zernike)  
- Margriet Hulshof (at ADL)  
They can advise and help you complete all the necessary procedures.

You can contact them by e-mail:  
- exchange.science@rug.nl  
- m.a.hulshof@rug.nl  
Or come by during the Office Hours:  
  - Exchange Office, Bernoulliborg, room 5161.0050  
  - ADL 1, room 3213.0017  

For additional information, see:  
- www.rug.nl/fwn/informatievoor/studenten/studerenbuitenland

**A3.4 NON-DEGREE-PROGRAMME-RELATED SUPPORT**  
During your studies you may run into all kinds of problems and questions. The following organizations may be able to help you:

**A3.4.1 University Student Desk**  
If you have any questions about application, admission, registration or deregistration, study delay, student finance and other financial matters, please consult the knowledge base at:  
  - www.rug.nl/education/hoezithet

If you cannot find the answer to your question, just click the contact button to send an e-mail.

You can also contact the University Service Desk (USD) at the Academy Building about any of these issues. If the USD cannot help you, they will refer you on, for example to the Student Service Centre. You can make an appointment for the SSC student counsellors’ office hours via the USD. At the end of August and the first weeks of the academic year the USD holds office at the Zernike Complex as well.

For the contact details and the opening hours of the USD, go to:
A3.4.2 Student Service Centre (SSC)

The Student Service Centre is the student counselling expertise centre of the University of Groningen. The student counsellors, psychologists and trainers work together to provide an integrated package of student support with the aim of helping students with their studies. They can prevent or remove possible impediments to your study progress so that you can develop fully during your time at university.

The SSC has a wide range of support facilities – information and advice, individual sessions, short-term therapy and a wide variety of workshops and training courses.

Information, advice and counselling

The student counsellors have been appointed by the University to provide confidential counselling for students. They deal with all kinds of non-degree-programme-related matters such as significant study delay (more than 3 months (15ECTS)), legal matters, complaints, objections and appeals, but also questions concerning choice of degree programme, financial help and personal and confidential matters.

You can make an appointment with a student counsellor via the Student Service Centre, Uurwerkersgang 10, telephone: (050) 363 8066 or via the University Student Desk (USD), Broerstraat 5, telephone: (050) 363 8004.

Short-term therapy

Not everyone will have an easy time adjusting to a new environment, strange customs and a different language. This does not necessarily mean that you will need professional help, but if problems begin to affect your studies and your personal life, you can always ask the psychological counsellors for help. This help is available to all students at the University. An initial assessment is free of charge, follow-up sessions will cost EUR 40 (once-off payment).

Training courses and workshops

Do you have a tendency to procrastinate? Are you not sure how to deal with Multiple-choice exams? Is learning how to study effectively still a challenge for you? For all these study issues and more you can find a course or workshop at the Student Service Centre.

Please visit the Student Portal for more information.
Open office hours for International Students
Living and studying in a foreign country is a great experience, but sometimes problems can stand in the way of studying successfully. Do you doubt your study methods? Are you encountering study problems? Or are you experiencing personal difficulties? Come to the open office hours for international students at the Student Service Centre of the University of Groningen. An expert from the Student Service Centre will try to help you solve your problems. In some cases they might refer you to a student counsellor, a psychological counsellor or one of the workshops of the Student Service Centre. Participation is free. You don’t have to register. Just come in during the hours that are stated on the Student Portal and report to the information desk at the Student Service Centre, Uurwerkersgang 10 in Groningen.

A3.4.3 International Service Desk (ISD)
The International Service Desk (ISD) provides information to foreign students, prospective students and foreign researchers, specifically with regard to studying, 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.

For more information, see:
• www.rug.nl/education/international-students/international-service-desk

A3.4.4 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 student 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. ESN 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. A small-scale activity such as a dinner or movie is organized every Sunday. And last but not least, ESN-Groningen publishes a magazine especially for international students, the WaM.

Location: Pelsterstraat 23, 9711 KH Groningen
Telephone: (050) 363 7176
E-mail: info@esn-groningen.nl
Website: www.esn-groningen.nl

If you want to be kept informed of all the upcoming events and activities send a mail to their e-mail address.
A3.4.5 Careers advice before, during & after your degree

**NEXT**
The University of Groningen wants to offer its students the best possible facilities to prepare and develop their careers. Within the framework of NEXT, various activities are organized to help students make choices – and study choices in particular – and prepare them for the job market. In order to achieve this, NEXT is working actively with faculties, study associations, alumni organizations and other providers in the field of careers services. Announcements can be recognized by the NEXT logo.

Visit for more information:
- [www.rug.nl/next](http://www.rug.nl/next)

The Faculty of Mathematics and Natural Sciences will make student career events, student-assistant positions and regular job vacancies related to their degree programmes available in the Student Portal at the tab Career.

A3.5 HEALTH AND SAFETY

A3.5.1 Fire and emergencies
Dial (050 363) 8050 in the event of fire or an accident. Clearly explain the situation and location. For other less urgent matters, call (050 363) 5520 to report malfunctions or irregularities.

A3.5.2 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 may 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. This is also known as the ‘5W approach’.

**Workload**
Undertake regular time planning and prevent creating peaks in workload. If necessary, take a ‘study skills’ course at the Student Service Centre (tel. (050) 363 8066). 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 help you unwind. If you do not feel on top of things drop by your academic 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 between 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 on your computer for more than five or six hours a 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 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. 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.

Finally
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:
Mr A. Weitenberg, or the Head of the Department of Occupational Safety, Mr J. Jager.
E-mail: a.c.d.weitenberg@rug.nl   Telephone: (050) 363 4618
E-mail: jack.jager@rug.nl       Telephone: (050) 363 4427
A4
FACILITIES

A4.1 BUILDINGS
The teaching and support facilities of the faculty are accommodated in a number of buildings:

- **Linnaeusborg** (buildings U, 5171–5174): Centre for Life Sciences, Nijenborgh 7, 9747 AG Groningen; telephone reception (050) 363 2021. Open: 8:00 – 20:00.

- **Bernoulliborg** (building V, 5161): ESC – Mathematics – Computing Science Artificial Intelligence, Nijenborgh 9, 9747 AG Groningen; telephone reception (050) 363 6868. Open: 8:00 – 20:00.


- **Kapteynborg** (building J, 5419): Astronomy, Landleven 12, 9747 AD Groningen; telephone secretary (050) 363 4074. Open during office hours, ring the bell to enter the building.

- **ADL1** (buildings 3211–3217/3219): ESD, Medical Sciences, Dentistry and Pharmacy, Antonius Deusinglaan 1, 9713 AV Groningen; telephone reception (050) 363 8000. Open: Mon–Thurs: 8:00 – 20:30; Fri: 8:00 – 17:30.

For a map, route description and more information about the buildings, see:
- [www.rug.nl/fwn/organization/locaties](http://www.rug.nl/fwn/organization/locaties)

A4.1.1 House rules, regulations
Staff, students, visiting researchers and visitors are required to obey the facility house rules.

- Smoking ban. In accordance with Dutch law there is a general ban on smoking in public buildings;
- Mobile phones should be switched off 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.

Everyone who works or studies at FMNS will come into contact with matters of safety, health and the environment. Many national rules and regulations about health have been formulated in the Working Conditions Act. The Environmental Protection Act contains a lot of rules concerning the environment. The consequences of these regulations for students and staff members are described in several manuals available on the internet:
- [myuniversity.rug.nl/infonet/medewerkers/fwn/arbomilieuveiligheid](http://myuniversity.rug.nl/infonet/medewerkers/fwn/arbomilieuveiligheid)

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 escape routes;
- 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!

Building rules: Faculty of Medical Sciences
- All bikes should be placed in the bike parking facilities below building 3219 or in the bicycle racks next to this building. Nowhere else!
- Food and drink are prohibited in the lecture halls with the exception of bottled water;
- All lectures start at the time indicated in the timetables. Someone from the Education Support office will be present (Keuninzaal and 3219.0061) 15 minutes before the scheduled start of the lecture to give technical support where required;
- Doors to the lecture halls will be closed shortly after the start of the lecture to avoid interruption from late comers. It is possible to leave the room at anytime;
- Please be quiet. Noise, even whispering is distracting for lecturers and fellow students.

Protocol for removal of bikes at Faculty of Medical Sciences
The Faculty of Medical Sciences has strict rules for the management of bike parking around the Antonius Deusinglaan 1 and 2 buildings because bikes which are not parked in the parking facilities cause a lot of inconvenience: bikes which are not parked correctly will be fixed on the spot and removed upon repeated violation.

A4.2 LIBRARIES
The mission of the library of the University of Groningen is to support and promote academic teaching and research by providing high-quality information services, the aim is to achieve this by adopting a demand-oriented and innovative approach. The University of Groningen has one central University Library (UL) and three location libraries: the University Library Zernike, the Central Medical Library and the Library of Behavioural and Social Sciences. Many facilities are provided collectively by these libraries. There is, for example, one central catalogue and one lending system, and a large number of online databases can be accessed through the university network.

A4.2.1 University Library
The central University Library (UL, or in Dutch ‘UB’) functions as a facility centre for the entire university community – for faculties and library users. The collections of Arts, Archeology, Law, Philosophy, Theology and Religious Studies have been moved to the UL recently, and are available in the study halls. For students there are lots of facilities and there is room to study. Furthermore, the library holds vast collections of reference and teaching material, either available in the study halls or in the closed depots. Interdisciplinary works, bibliographical material and a number of special collections can also be found in the UL.
Electronic library
An important facility is the electronic library, for consulting catalogues, e-books and e-journals, online databases, etc. Word processing facilities are also provided. Access to this information is limited to students and staff of the University of Groningen, and is for personal study or research only.

A new catalogue has been introduced recently, SmartCat: a catalogue containing all printed and electronic works owned by the University of Groningen libraries, with direct links to the full text. Furthermore, the University Library provides access to a large number of academic journals online, see:

- [myuniversity.rug.nl/infonet/studenten/bibliotheek/zoeken/elektijdshr/](http://myuniversity.rug.nl/infonet/studenten/bibliotheek/zoeken/elektijdshr/)

You can access almost all online catalogues, databases, e-books, e-journals, etc. from any computer within the RuG network, and, even outside the campus through Connect, see:

- [myuniversity.rug.nl/infonet/studenten/bibliotheek/zoeken/connect](http://myuniversity.rug.nl/infonet/studenten/bibliotheek/zoeken/connect)

Borrowing
You can use your University Card to borrow publications from the libraries of the University of Groningen. The loan period for books is four weeks unless otherwise stated. Please return books or renew the loan before the loan period expires.

In general, loans can be renewed online through SmartCat by clicking on Borrower Information, provided that the loan period has not expired, that nobody has put a hold on the book and there are no fines outstanding. Borrowed material can be returned to any UL location. You can e-mail any questions to:

- [bibliotheek@rug.nl](mailto:bibliotheek@rug.nl)

For more information, go to the Student Portal.

Address University Library
Location: Broerstraat 4, 9712 CP Groningen
Telephone: (050) 3635020 and/or (050) 3635000
E-mail: [bibliotheek@rug.nl](mailto:bibliotheek@rug.nl)

A4.2.2 Library at Zernike campus
The UL Zernike is the joint library of three faculties located on the Zernike Campus: Economics and Business, Mathematics and Natural Sciences and Spatial Sciences. The library is responsible for the scientific information supply for students and staff of these faculties, and offers an extensive collection of journals, books and databases, printed and/or electronic. The electronic collection can be found through the Student Portal.

You can access most databases from anywhere, using the internet. For instance your home computer. In the UL Zernike you can find literature in one of the discipline-related collections, you can borrow or return books, you can use one of the 84 university workstations, or simply find a quiet place to study. The library offers tutorials and support in literature searches. For instance an information literacy training and RefWorks workshops.

Visit our library and have a look at what it has to offer. You are very welcome!

For current opening hours, address details and a range of scientific information and workshops, please go to the Student Portal.
Here you will find both general and location-specific information.

**Address University Library Zernike**
Location: Nettelbosje 2, 9747 EA Groningen  
2nd floor of the Duijzenberg building  
Telephone: (050) 363 3708  
E-mail: zernike-bibliotheek@rug.nl

**A4.2.3 Library of the University Medical Center Groningen**
More information on the Central Medical Library can be found on the Student Portal.

**Address Central Medical Library**
Location: Hanzeplein 1, 9713 GZ Groningen  
Winkelstraat 1 or Poortweg 12, 4th floor, Y 4.202  
Telephone: (050) 363 3048 and/or (050) 361 2596  
E-mail: cmb@umcg.nl

**A4.3 INFORMATION AND COMMUNICATION CHANNELS**

**A4.3.1 Personal account**
After enrolment, you will receive a student number and a personal computer account by email. A student computer account, consisting of a login name and a password, provides access to several web-systems and storage servers. This includes:
- Access to the Faculty Novell servers, for the use of computer applications;  
- Access to the Internet;  
- Use of a personal data storage server;  
- Use of an e-mail account;  
- Access to Nestor, the electronic learning environment of the University of Groningen;  
- Access to ProgRESS WWW, where you can enrol in courses and exams, and view your study results.

You will 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 per email. You can change your password at:
- myuniversity.rug.nl/infonet/studenten/ict/werkplek/

For information about IT facilities for students accessible with your account see the IT knowledge base for students on the Student Portal.

**A4.3.2 Student Portal**

The Student Portal is a protected environment that contains information for students of the University of Groningen. You can log in with your student number.

**Personalize your dashboard**
Once you log in to the Student Portal you will be taken straight to your personal homepage, known as the Dashboard. A small part of the Dashboard contains information for everyone. The rest can be furnished to taste, using what are known as widgets. You can, for example, install widgets for Twitter, the UK, the CIT Service Desk, the Library or My News. Have a look in the Widget Store (via the button Options on the Dashboard) to get an idea.
All information from the RUG Planner, ProgRESS WWW and Nestor, to name but a few applications, are also easily accessible via your own Dashboard.

*The Student Portal* is also the primary source for the Education Support Desk to provide you with up-to-date information concerning your study program. This involves important announcements about your program (such as deadlines, procedures, changes, workshops), but also documents that you will need to apply for graduation, a minor or a bachelor project, documents about studying abroad, information about minor, master possibilities, etc.

Students are urged to check this site daily, to avoid missing important events. All information that is published on *the Student Portal* is considered to be known by students. Practically, this means that any problems arising from not having read the information on *the Student Portal*, will be solely the responsibility of the student.

### A4.3.3 E-mail

- [googleapps.rug.nl](http://googleapps.rug.nl)

Your e-mail address is one of the primary means of personal communication of the University and the Faculty. For example, if one of the University employees (teacher, academic advisor, etc.) would like to send you a personal message, he/she will send it to your University e-mail address. Your e-mail address consists of name@student.rug.nl. Your name is made up of your initials and your surname, separated by dots.

Your University e-mail may also be used by the university to send you important messages such as requests for enrolment for certain courses or alterations to the timetables.

Students are expected to check their mailbox every day. For your own convenience, you may choose to forward your University mail to your private mail (use the settings after login).

The University of Groningen uses Google Apps for Education which gives students permanent access to their e-mail (Gmail), calendar (Google Calendar), chat (Google Talk), documents (Google Drive) and web pages (Google Sites).

For more information, see the Student Portal.

You can access your Google Apps University of Groningen account via:

- [googleapps.rug.nl](http://googleapps.rug.nl)

This is where you log in with your student number and password (RUG account). The first time you log in, you will see a screen with a request from SURFconext. Click on *Yes, share this information* to activate your Google Apps for Education account.
Ocasys is the university course catalogue. It contains information about the content of courses, learning objectives of courses, necessary literature of courses, assessment form and computation of final grade of courses, and the general outline of the degree programmes. You can search in Ocasys for courses as well as for degree programmes. However, the full description of the degree programmes can only be found in the programme specific part of the studyguide. Ocasys serves with regard to the assessment form of courses as an appendix of the Teaching and Examination Regulations (see Section C1.2). It contains the official information about the way courses are assessed.

You can compose your own schedule by searching for courses or a degree programme. Please check the schedules on a regular basis, changes are still being made.

Nestor is the electronic learning environment of the University of Groningen. Lecturers use Nestor to provide information about courses, to set electronic examinations and to exchange documents within their students. Students use Nestor to read important announcements, to cooperate with group members and to submit assignments. You will be enrolled in a Nestor-course environment after you enrol for the specific course or corresponding exam in ProgRESS WWW. However, enrolment in a Nestor course does not mean you are allowed to participate in the course itself, therefore you need to be registered in ProgRESS WWW for the course (see also Section A2.4).

ProgRESS WWW is a web-based application used by the University of Groningen. Students need to register for modules and exams well in advance. You may also use ProgRESS WWW to view your study results.

You can use PCs at various University facilities by logging 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 courses, but when these are not scheduled you can use the room for self-study. Printers are also available for students.

Using the University IT facilities implies that you agree to the usage rules for University IT facilities as published on:

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!

A4.4 PRINTING, COPYING AND SCANNING
Students can use the multifunctional printers for printing, copying and scanning. Printing facilities are located close to the student computer rooms. The printers and copiers for students have equipment for reading and devaluating the card and choosing the job to print. You can pay your printouts with a credit on your University Card. This credit can be topped up through MyOrder or through Webdeposit. Identify yourself at a printer with a University Card or by entering your student number and password, to release the machine or print job.

For more information, see the Student Portal.
B Master’s degree programmes
Chemistry
Chemical Engineering
B1
GENERAL INFORMATION

B1.1 INTRODUCTION
The University of Groningen offers the opportunity to study Chemistry as well as Chemical Engineering. Graduates of these Master programmes are awarded the degree Master of Science (MSc).

Data liable to change during the academic year, such as schedules for classes and examinations, and detailed information about the contents of the courses can be found on the following websites:

For your schedule:
- http://rooster.rug.nl
- http://www.rug.nl/fwn/roosters

For course information:
- https://www.rug.nl/ocasys/fwn/vak/showpos?opleiding=5557% (Chemistry)
- https://www.rug.nl/ocasys/fwn/vak/showpos?opleiding=3235% (Chemical Engineering)

In case of individual situations or circumstances for which this study guide does not provide sufficient information, it is advised to consult the study advisor.

B1.2 GRADUATE SCHOOL
The Faculty of Mathematics and Natural Sciences comprises of an undergraduate school, a graduate school, an education support center and thirteen research institutes.

In the field of Chemistry the following centres of research are important:

Zernike Institute for Advanced Materials (ZIAM): materials research
- http://www.rug.nl/research/zernike/

Contact information:
Prof. dr. T.T.M Palstra  t.t.m.palstra@rug.nl  050 363 9631
(scientific director)
J.K. de Boer  j.k.de.boer@rug.nl  050 363 4843
(secretariat)

Stratingh Institute: organic chemistry and inorganic chemistry
- http://www.rug.nl/research/stratingh/

Contact information:
Prof. dr. J.C. Hummelen  j.c.hummelen@rug.nl  050 363 5553
(scientific director)
H.H. Biemold  h.h.biemold@rug.nl  050 363 4235
(secretariat)
Groningen Biomolecular Sciences and Biotechnology Institute (GBB): biomolecular research
- http://www.rug.nl/research/gbb

Contact information:
Prof. dr. B. Poolman  gbboffice@rug.nl  050 363 4008
(scientific director)

T. Hummel  t.hummel@rug.nl  050 363 4203
(secretariat)

Research Institute of Technology and Management (ITM): chemical technology
- http://www.rug.nl/research/itm/

Contact information:
M.M. de Jonge  m.m.de.jonge@rug.nl  050 363 4484
(secretariat)

These institutes are subdivided in various research groups, which you can find here:
- http://www.rug.nl/research/fmns/group/chemistry-oriented;

or here if you are interested in chemical biology:
- http://www.rug.nl/research/fmns/group/biology-oriented;

or here if you are interested in materials and chemistry that is close to physics:

The greater part of the scientific staff in the field of chemistry is active in one of these research institutes, while taking part in teaching activities of the undergraduate and graduate school.
The Master programmes Chemistry and Chemical Engineering are part of the graduate school. The director of the Master programme for Chemistry is prof. dr. S. Otto.
The director of the Master programme for Chemical Engineering is prof. dr. F. Picchioni.

B1.3 BETA SCIENCE SHOP
Non-commercial groups and institutions can profit from all the knowledge and experience of the Faculty via the Beta Science Shop.
The Science Shop acts as a mediator between the questioners on the one side and the researchers (both students and staff) on the other. Eligible groups are, for example: environmentalist groups, labour unions, patient groups, community organizations, schools and authorities.
Questions can cover any topic of expertise within the beta sciences, from mathematics and engineering to biology and the life sciences.

Coordinators of the Science Shop are:
Drs. C.M. Ree  c.m.ree@rug.nl  050 363 4132
Dr. H.A.J. Mulder  h.a.j.mulder@rug.nl  050 363 4436

More information can be found:
**What does the Science Shop do?**

Environmental movements, labour unions and other non-commercial groups can present their questions to the Science Shop. When these questions are suitable for research projects or educational projects, the Science Shop will find researchers or students to do research on the question. Students can carry out a project within their study programme. This usually concerns a literature/patent study, expert interviews, making calculations and/or doing some modelling and design (of part of a process, of software, or of information sheets), and sometimes it also concerns experiments. The length and the level of the project can be tailored to the student’s options, so it can be the subject for your BSc or MSc research project.

**What do you learn from it?**

Research into a client’s question has several aspects you ordinarily do not encounter during your studies. This can be very instructive. You can play a role in a social issue. You will discuss the question together with the client, discuss the (im)possibilities of scientific research and its role in the client’s strategy. It can bring you in frequent contact with authorities and with research institutions during your research. As a result you can write a report that shows scientific quality, but that is understandable for laypeople too. Your report could eventually lead to an external publication of the Science Shop and/or an article in a popular magazine.

**How does it fit into your studies?**

There are several possibilities to fit projects of the Science Shop into your studies. For example:

- as optional credits at the Science Shop, in co-operation with a supervisor within the Faculty; the length and the level of the project can be discussed freely.
- as research project or graduation thesis (BSc or MSc) in any discipline of the Faculty, provided that there is prior agreement with the responsible member of staff within that discipline
- as integrative project, working visit or internship in Chemical Engineering
- as project at the ESRIG - Energy and Sustainability Research Institute Groningen (ESRIG)
- as traineeship in the Master Science, Business and Policy (SBP)
- as assignment in the Master Education & Communication

Projects may be carried out individually or in groups of two or three students. Supervision/advice will be sought at research schools, and if required also outside the Faculty, depending on the subject of the project. The projects can be planned at any time during the studies. The offer of projects changes frequently; an overview is available on the website. It is recommended to apply for a project in good time, because of the choice and preparation of the project.

When you plan to do a Science Shop project, or if you would like to see if there are interesting projects available, just contact the two coordinators. Students from all disciplines in the Faculty can apply and are more than welcome.

**Some recent examples**

*Chemistry: Cleaner PUR production*

Polyurethane is a widely used polymer with an increasing amount of applications and good market perspectives. A Chinese company is active in the production of the isocyanate MDI, a major polyurethane feedstock, and has showed some interest in Delfzijl as a location for a new MDI plant. However, MDI has a bad reputation in occupational health as an inductor of respiratory diseases; moreover, the MDI production process includes hazardous substances like phosgene and aromatic chlorinated solvents. So a student of Chemistry conducted a literature survey to cleaner production processes for MDI and polyurethane, on request of
the regional Environmental Federation. There are some interesting perspectives for cleaner processes; however, they’re still in a research stage.

*Environmental Health: Fragrances and sensitivity*

The effects of environmental pollution on human health is a matter of concern to the Platform of Health and Environment. An investigation of environmental factors related to health complaints (as experienced by the complainers) showed a high score for fragrances as a cause of sensitivity in the respiratory system. Fragrances are widely used in cosmetics, food and several household products and their application is emerging rapidly. A student of Chemistry reviewed the chemistry of fragrances and the technology to provide long-lasting odours, for instance in laundry. However, literature on their respiratory effects is scarce and no valid explanation could be found for the phenomena of multiple chemical sensitivity.

**B1.4 SUPPORTIVE STAFF AND COMMUNITTEES**

**Academic advisor**
- Drs. ing. W.G. (Wendy) Hof
  w.g.hof@rug.nl
  (050) 363 4291

**Programme coordinator**
- Drs. R.V. (Renske) Elferink-Vonk
  r.v.elferink@rug.nl
  (050) 363 5194

**Board of examiners**
- (Kim) Winters
  escchemistry@rug.nl
  (050) 363 3318

**Practical coordinator**
- Ing. J. (Jort) Robertus
  j.robertus@rug.nl
  (050) 363 6967

**Chemistry practicals**
- R. (Roelof) Kloosterman
  R.Kloosterman@rug.nl
  (050) 363 4366
- R.M. (Rene) Liewes
  R.M.Liewes@rug.nl
  (050) 363 4290
- J. (Jur) van Dijken
  J.van.Dijken@rug.nl
  (050) 363 4290

Other supportive staff members are part of the Education Support Center, see chapter A3.

**Programme committee**
The task of a Programme Committee is to advise on the teaching and examination regulations, (i.e. the implementation of the teaching programmes in the relevant discipline), on matters relating to the implementation of the teaching programmes (i.e. the annual evaluation of how the teaching and examination regulations are implemented) and to give solicited and unsolicited advice on all education-related matters in the relevant discipline. The Programme Committee can issue its advice to the Programme Board, to the Faculty Board (usually through the Programme Board), or to individual teachers and staff members.
Programme committee Chemistry and Chemical Engineering
Chairman: Prof. Dr. S.J. (Siewert-Jan) Marrink
Secretary: Drs. R.V. (Renske) Elferink-Vonk
m.w.Fraaije@rug.nl r.v.elferink@rug.nl
(050) 363 4345 (050) 363 5194

Further information about the Programme Committees can be found at Student Portal

Board of Examiners
The Boards of Examiners is responsible for assuring the quality of assessment procedures, ensuring that examinations and final assessments proceed satisfactorily, and for assessing whether individual students have fulfilled the requirements for the award of the degree certificate. The Boards of Examiners are also responsible for special arrangements, exemptions etc. for individual students. Student requests and questions should be directed to the secretary of the board.

Board of Examiners for Chemistry and Chemical Engineering
Chairman: Prof. Dr. J.G. (Gerard) Roelfes
Secretary: (Kim) Winters
j.g.roelfes@rug.nl eschemistry@rug.nl
(050) 363 7745 (050) 363 3318

Further information about the Boards of Examiners can be found at Student Portal.

B1.5 STUDY ASSOCIATION
DE CHEMISCHE BINDING
De Chemische Binding is the study association for students of Chemistry and Chemical Engineering at the University of Groningen. It was founded in 1959 as a sub faculty association. Eight years later it became a study association. The goal of our association is to support our students with their study and to look after their interests.

To reach this goal, we supply the books and lab coats for the students. Furthermore, we organize study related activities like lectures, excursions and symposia. We have a committee named de CB-Stem, a participation committee, which evaluates the courses to improve the quality of the education. For third year students we organize a parent day for the parents of the students. They will get a tour through the labs and will do some practical work themselves too. And last but not least, every year we travel to different countries to visit chemistry related companies and universities.

We try to make an almanac every year. In this almanac you will find descriptions of the study associations in Groningen, related study associations throughout the country and research groups of the University of Groningen. Also there is a register of all the students with their picture and phone number, which can be very handy.

After a hard day of studying it is also important to relax! Therefore we organize activities like a board games evening, the night volleyball tournament, the klaverjas competition, the pool tournament, disco bowling, Christmas dinner and a barbecue at the end of the year. We also have the Friday-afternoon-drinks, which are organized every Friday.

Next to these activities we have an association magazine named Het Chemisch Bindmiddel, which contains reports of activities, columns and descriptions of researches. Also every year the Open Nederlandse Chemie Sportdagen (O.N.C.S.) is organized, at which all the related study associations through the country come together to sport.
Most of the activities are organized by our committees, which are all introduced in the almanac. These committees are supported and guided by the board of De Chemische Binding.

You can become a member at the beginning of your study, but of course also later on. If you are interested in one of the committees, in De Chemische Binding or if you have questions, you can come by at our place: het CB-Hok (at the back of the canteen in the NCC, second door on the right). You can also reach us via:

De Chemische Binding, Nijenborgh 4

Phone: 050-363 4117
E-mail: cbestuur@chemische-binding.nl
Internet: http://www.chemische-binding.nl

G.T.D. BERNOUILLI
The Gronings Technologen Dispuut Bernoulli (G.T.D. Bernoulli) was founded on May 20, 1985 and is the study association for students with an interest in process and product technology. The association is mainly focused on students from the third year of the bachelor programme and from the two years of the master programme of Chemical Engineering. The main goal of the study association is to enrich the student life of all Chemical Engineers. We do this by small things such as providing coffee and tea during coffee-hours and drinks every Friday afternoon, as well as by organizing lectures and excursions with companies. Typically, G.T.D. Bernoulli organizes such lectures or excursions once a month, as well as a monthly social activity. These are ways to get to know your fellow students better. Also by visiting various companies, you get a better picture of what is possible in the field of Chemical Engineering.

Examples of activities we organize are wokken, theme drinks, paintball, table tennis tournament, hitchhiking and the end of the year BBQ. It is very important that you enjoy your time as a student and by organizing these kind of activities, we hope to contribute to that! We also have a magazine, called the Groningenieur (GRIR), in which research and reports are written. The magazine also contains many pictures of activities and some fun articles as well as a puzzle.

Furthermore, we are in close contact with the Chemical Engineering department. Together we organize for instance information sessions on master thesis subjects or practice sessions for difficult courses. Many of G.T.D. Bernoulli’s members have already followed courses that you might still have to pass, and can help you with any questions you might have. There is also an annual symposium on a typical Chemical Engineering topic organized by us.

All in all, the association provides a foundation for your studies and offers many possibilities. Once you are in the third year of your bachelor’s Chemical Engineering or in your master, you can join G.T.D. Bernoulli. It is possible to subscribe online via the website or ask someone in our Lounge! You can find us here:

G.T.D. Bernoulli, Nijenborgh 4, “Bernoulli Lounge” Room X5118.0238
Telephone: 050 363 4399
E-mail: board@gtdberoulli.nl
Internet: http://www.gtdberoulli.nl/
Society of polymer chemists “Netwerk”

On the 24th of October 1991 the association of the Polymer Science group was established: “Netwerk” (Network). This society is meant for the entire research group, i.e. science staff, general staff and, of course, the students. At the moment “Netwerk” has around 50 members. The goal of the society is maintaining contact between organizations in the field of polymer chemistry, in particular in trade and industry. Several activities are organized in the light of this goal, such as excursions, lectures and symposia. Furthermore, “V.v.P Netwerk” sets up activities within the group to encourage mutual contact between the members. For example, the General Polymer Colloquia (GPCs) and drinks, but there is also an annual sports tournament in which the participants compete for the “Netwerk” cup. With these activities “V.v.P. Netwerk” makes sure the members of the polymer chemistry group get to know each other in a rather different manner than during the work in the lab.

If you would like to become a member of “V.v.P Netwerk”, or if you would like more information email us or visit the website.

Society of polymer chemists ”Netwerk”
Nijenborgh 4, department Polymer chemistry
Telephone: 050 3634510 (secr.)
E-mail: vvp@rug.nl
internet: www.vvpnetwerk.com
B2

STUDY AFFAIRS

B2.1 STUDY EXPENSES

Costs of textbooks and educational tools are relatively low. For the master programme € 1000,- covered most of the compulsory textbooks, manuals, practical materials, excursions, etc. last year.

The University of Groningen 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.

Students can obtain information on the cost policy at www.rug.nl/insandouts. They can also visit the University Student Desk or their study advisor.

The study costs for the master programme in Chemistry and Chemical Engineering are estimated well below the maximum of € 1440,-.

B2.2 STUDENT ASSISTANTSHIP

Senior students have the opportunity to gain valuable experience as a teaching assistant. Teaching assistants mainly teach exercise classes or assist during computer sessions or practicals. Also, grading homework or exams may be a task of teaching assistants. Of course the teaching assistant is paid for his services.

Students interested in a teaching assistantship can gain more information from the study advisor, check Student Portal (tab Mycareer) or wait an email from the programme coordinator advertising for assistants.

B2.3 EXAMS

Procedures during exams

Students are required to show their student card at written exams.

Graphing calculators are not permitted unless such is explicitly allowed by the lecturer of the course.

Electronic pocket calculators without graphic display are allowed.

Students are obliged to follow the directions of the vigilance personnel.

B2.4 GRADUATION

Enrolment procedure for graduation

1. Courses should be filled in in Progresswww.

2. Approval by the Board of Examiners

   The Board of Examiners considers the list of results on the course units that are part of the degree programme. The procedures should be completed about six months before the graduation date and at least one month before the graduation date (= the date on the graduation certificate). When all courses are finished, the student will receive an invitation and receive a schedule with time and place of the ceremony.

3. Research thesis

   Together with the request for graduation a digital copy of the final version of the master's thesis should be handed in at the Education Support Desk. An electronic copy should uploaded into the repository of the library. Instructions are on the application form for your diploma.

Graduation is only possible for enrolled students. It is strongly advised that the student files a request for graduation as soon as (or even some weeks before) all requirements of the curriculum have been met in order to prevent unnecessary tuition costs.
Graduation ceremony

The graduation ceremony usually takes place in the Academy building Broerstraat 5 in Groningen. After proper registration the student will receive a schedule with time and place of the ceremony.

At the graduation ceremony the graduate receives a graduation certificate together with a diploma supplement stating the grades on the separate course units.

Usually the graduation date coincides with the date of the graduation ceremony. In some cases (usually around September 1) the graduation ceremony may be postponed to September. This may be the case when the last examination results are obtained in the last weeks of August and the administrative procedures for graduation cannot be timely fulfilled before August 31 (i.e. before the end of the academic year). When the examination results do so permit, the graduation date can be set at August 31, whereas the graduation ceremony takes place in September.
B3
MASTER OF CHEMISTRY

B3.1 INTRODUCTION
To be admitted to the master programme in Chemistry, the student must have obtained the prerequisite bachelor degree in Chemistry. In case a student does not meet this requirement, but does hold a bachelor degree in a related field, the student can in some cases still be admitted. In this case the student must consult the study advisor to set up an individual programme to eliminate deficiencies.

A student can graduate:
- for a position as a scientific researcher or
- in the field of policy and management functions in trade and industry and public authorities, for which scientific knowledge and skills are desirable (SPB-variant)

The studies are mostly attended on an individual basis in research projects and/or traineeships at companies/administrative bodies. Furthermore, specific courses have to be taken for each variant.

The master is primarily concentrated on the profession of a researcher. This study concentrates on a continuing research in preparation for a dissertation (PhD). Obviously, students graduating the SBP-variant are also allowed to apply for PhD positions. In fact, for some PhD positions the SBP-variant may be more desirable than the regular master.

B3.2 LEARNING OUTCOMES OF THE MASTER'S DEGREE PROGRAMME CHEMISTRY
The objectives of the master’s degree programme Chemistry are:

- to prepare students for an independent professional career; in this context this means being able to carry out fundamental or applied scientific research, as well as applying state of the art scientific knowledge in a wide variety of new practical situations,
- to make students develop skills, knowledge and insight in a specialization area of the field of study, with a focus on insight in and approach to scientific problems,
- to make students develop the ability to clearly and concisely communicate the acquired knowledge to others.

The objectives of the programme result in the following learning outcomes

G. General academic skills for the master’s degree programme Chemistry
The graduate
1. is able to keep up with and make use of professional literature in relevant subfields,
2. is able to make himself/herself familiar with a subfield of the own discipline within a reasonable time span,
3. is able to formulate a research plan based on a problem description in a subfield of the own discipline,
4. is able to analyze, interpret using state of the art information, and draw conclusions from research results,
5. is able to operate effectively in a position in which knowledge and research skills within the field of the own discipline are required,
6. is able to perform in a multidisciplinary team, transfer knowledge to others, give oral presentations, write a report or internationally accessible scientific article, and take part in a scientific discussion,
7. is able to design, conduct and evaluate experiments and the necessary checks and balances independently,
8. is able to relate his/her own results and conclusions to results already available in the literature,
9. has sufficient understanding of the role of the own discipline in society to come to a well-considered choice and practice of profession,
10. has an understanding of the role of the own discipline in a sustainable society.

CH. Specific academic knowledge and skills for the master’s degree programme Chemistry. The graduate
1. has advanced knowledge of aspects of one of the following fields of knowledge:
   - Advanced Materials: synthesis, characterization and properties of materials; the relation between chemical and physical properties of materials on the one hand and the nature of the chemical bonding, and molecular and crystal symmetry on the other hand.
   - Catalysis and Green Chemistry: reactions and interactions of molecules and the application of this insight in synthetic chemistry and catalysis as well as knowledge about sustainable chemistry.
   - Chemical Biology: behavior and design of biochemical systems and their function properties. Synthetic biology as well as protein engineering.
2. is able to judge whether the properties of created products and possible side or waste products can result in undesired side effects in the short or long term,
3. is able to work at academic level on a research problem in an area of chemistry, which is not his/her own main field of study,
4. Science, Business and Policy specialization is prepared for a professional career in management and policy.

B3.3 STUDY PROGRAMME

B3.3.1 Core programme
Part of the master programme Chemistry is mandatory for all students:

- Reaction Mechanisms (5 ECTS)
- Structure Determination with Spectroscopic Methods (5 ECTS)
- Final Exam (5 ECTS)
- Colloquium (5 ECTS)
- Master research project (45 ECTS)
- Second research project (15 ECTS)

Students are allowed to add 5 extra ECTS to their second research project at the expense of an elective. They will need to request permission from the Board of Examiners. The core programme consists of 80 ECTS in total. The remaining 40 ECTS consists of a track-specific programme of 20 ECTS and an elective part of 20 ECTS.
**B3.3.2 Track-specific programme**
Within the master programme there are three different tracks, which are related to different areas of research at the University of Groningen.
- Advanced Materials for the students who completed the Smart Materials track.
- Catalysis and Green Chemistry for students who completed the Sustainable Chemistry and Energy track. This track is shared with the master programme Chemical Engineering.
- Chemical Biology for the students who completed the Chemistry of Life track.

Each track consists of four mandatory courses, each worth 5 ECTS.

If you are unsure which track most suits you, you can discuss this with your study advisor.

Further information on the master programme, including track-specific courses and suitable electives can be found on Ocasys:

**B3.4 EXAMINERS AND SUPERVISORS**
For your two research projects, colloquium and final exam you will need to find your own examiners and supervisors. A list of teachers who are allowed to be an examiner can be found on the Student Portal community Master Chemistry and Chemical Engineering, under Board of Examiners.

**B3.5 ERASMUS MUNDUS MASTER PROGRAMME TCCM**
The Erasmus Mundus master programme Theoretical Chemistry and Computational Modeling (TCCM) is very suitable for students who have an interest in theoretical chemistry and want to study abroad as part of an international master programme.

For more information:

You can also talk to the contact person for the programme:
**Prof. dr. R. Broer**  
r.broer@rug.nl  
050 363 4374

**B3.6 PROGRAMME SBP-VARIANT SCIENCE, BUSINESS AND POLICY**
Within the framework of the MSc-degree programme in Chemistry students who speak and understand Dutch may opt for the SBP-variant Science, Business and Policy.

There are two introduction courses: Introduction science and business and introduction science and policy.

The goal of this variant is to combine your specific scientific knowledge with insights in other disciplines, for example business and administrative management. The SBP-variant is meant for students who would like to work at a chemically oriented company or for students who like to be involved in policy making by public authorities.

As you can see in the table below, 60 ECTS of the SBP-variant are still specific to Chemistry, and the other 60 ECTS focus on business, policy and a traineeship.

Intensive courses will acquaint you with the main scientific frameworks and concepts in a relatively short time. You will apply this knowledge to project assignments of companies and public authorities in multidisciplinary projects. Students can take part in projects in their own field of interest.
M-variant ‘Science, Business and Policy’

<table>
<thead>
<tr>
<th>Course</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core programme of Chemistry</td>
<td>20</td>
</tr>
<tr>
<td>(Colloquium, Final Exam, Reaction Mechanisms, Structure Determination with Spectroscopic Methods)</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td>Research project</td>
<td>30</td>
</tr>
<tr>
<td>Introduction Science and Policy</td>
<td>10</td>
</tr>
<tr>
<td>Introduction Science and Business</td>
<td>10</td>
</tr>
<tr>
<td>Traineeship Business and Policy</td>
<td>40</td>
</tr>
<tr>
<td><strong>totaal</strong></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>

After the course you will follow the graduation-traineeship route Business and Policy, which consists of a traineeship of six months in a company or a government organization. The traineeship will continue where the introductory course has ended and will offer acquaintance with and exercise in project management. The traineeship is complemented with lectures, training, sharing experiences and reports in the two preparative weeks, a return week and a concluding week.

The traineeship gives you an opportunity to explore future professions and working conditions. During this traineeship the student works on solving a certain problem, either in business or government, with a relation to chemistry.

Take into account the following:
- The traineeship coordinator has to be consulted at least six months in advance of the traineeship
- Students can only do a traineeship after completing the introductory course Science, Business and Policy and the specific scientific programme of the section.

You can find more information about the course Business and Policy and the graduation-traineeship route below. For more information about the specialization Science, Business and Policy contact:

(lecturer and traineeship coordinator)
Mr. dr. H. Gommer  h.gommer@rug.nl  06-55751097
Drs. A.J. Abma  a.j.abma@rug.nl  050 363 2263
(lecturer)

See also:
- www.rug.nl/fwn/sbp
B4
MASTER OF CHEMICAL ENGINEERING

B4.1 INTRODUCTION
To be admitted to the master programme in Chemical Engineering, the student must have obtained the prerequisite bachelor degree in Chemical Engineering. In case a student does not meet this requirement, but does hold a bachelor degree in a related field, the student can in some cases still be admitted. In this case the student must consult the study advisor to set up an individual programme to eliminate deficiencies. Graduates will obtain a Master’s degree (MSc).

The studies are mostly attended on an individual basis in research projects and/or traineeships at companies/administrative bodies.

While the master programme in Chemical Engineering prepares students for a job in a company, students can also become researchers by applying for a suitable PhD position.

B4.2 LEARNING OUTCOMES OF THE MASTER’S DEGREE PROGRAMME CHEMICAL ENGINEERING

The objectives of the master’s degree programme Chemical Engineering are:

- to prepare students for an independent professional career; in this context this means being able to carry out fundamental or applied scientific research, as well as applying state of the art scientific knowledge in a wide variety of new practical situations,
- to make students develop skills, knowledge and insight in a specialization area of the field of study, with a focus on insight in and approach to scientific problems,
- to make students develop the ability to clearly and concisely communicate the acquired knowledge to others.

The objectives of the programme result in the following learning outcomes

G. General academic skills for the master’s degree programme Chemical Engineering
The graduate
1. is able to keep up with and make use of professional literature in relevant subfields,
2. is able to make himself/herself familiar with a subfield of the own discipline within a reasonable time span,
3. is able to formulate a research plan based on a global problem description in a subfield of the own discipline,
4. is able to analyze, interpret using state of the art information, and draw conclusions from research results,
5. is able to operate effectively in a position in which knowledge and research skills within the field of the own discipline are required,
6. is able to perform in a multidisciplinary team, transfer knowledge to others, give oral presentations, write a report or internationally accessible scientific article, and take part in a scientific discussion,
7. is able to design, conduct and evaluate experiments and the necessary checks and balances independently,
8. is able to relate his/her own results and conclusions to results already available in the literature,
9. has sufficient understanding of the role of the own discipline in society to come to a well-considered choice and practice of profession,
10. has an understanding of the role of the own discipline in a sustainable society.
CE. Specific academic knowledge and skills for the master’s degree programme Chemical Engineering.

Engineering knowledge and skills:
- the graduate has acquired specific knowledge and skills in the area of **fundamental and applied engineering sciences**. More specifically, the graduate
  1. is able to design a realistic process including specifying the sub-steps, like drawing flow charts, describing equipment and process flows, and calculating the behavior of process equipment; as well as to provide alternatives for these separate steps,
  2. has an understanding of i) process-product relations ii) ways to minimize byproduct and waste streams iii) manufacturing routes for classes of molecules and products.

Academic knowledge and skills in the product and process technology:
- the graduate is able to design chemical products based on a multidisciplinary approach (chemical and technological aspects). More specifically, the graduate
  1. has knowledge on product formulation, specifications, analytical methods, interactions between components and relevant physical and mechanical methods for the manufacture of chemical- or biotechnological products within one of the ‘product sectors’ bio-based products, industrial catalysts or polymeric products.
  2. is able to design a realistic product and associated process within one of the ‘product sectors’ bio-based products, industrial catalysts or polymeric products. This includes an analysis and design of all sub-steps, including specification of product properties, product flow diagrams, a description of process and processing equipment, as well as to provide alternatives for these steps.

**B4.3 STUDY PROGRAMME**

**B3.3.1 Core programme**
Part of the master programme Chemical Engineering is mandatory for all students:
- Bio-based products (5 ECTS)
- Catalysis for Engineers (5 ECTS)
- Interfacial Engineering (5 ECTS)
- Particulate Products (5 ECTS)
- Polymer Products (5 ECTS)
- Advanced Product Engineering (5 ECTS)
- Internship (15 ECTS)
- Master research project (50 ECTS)

The core programme consists of 95 ECTS in total. The remaining 25 ECTS consists of a track-specific programme of 15 ECTS and an elective part of 10 ECTS.
B3.3.2 Specializations
Within the master programme there are five different specializations:
In the product sector:

- Industrial Catalysts
- Polymeric Products
- Bio-based Products

In the process sector:

- Advanced process technology

One specialization is shared with the master programme Chemistry.

- Catalysis and Green Chemistry.

Each track consists of three mandatory courses, each worth 5 ECTS.

If you are unsure which track most suits you, you can discuss this with your study advisor. As part of your elective, you are allowed to take courses from one of the other tracks.

Further information on the master programme, including track-specific courses and suitable electives can be found on Ocasys:


B4.4 EXAMINERS AND SUPERVISORS
For your two research projects and traineeship final exam you will need to find your own examiners and supervisors. A list of teachers who are allowed to be an examiner can be found on the Student Portal community Master Chemistry and Chemical Engineering, under Board of Examiners.
**B5**

**POST MASTERS DEGREE PROGRAMMES**

**B5.1 POST-MASTER TEACHING DEGREE LVHO**

This degree programme is only available in Dutch, therefore the following information will only be provided in Dutch.

Wil je docent worden, maar ook je masterbul in Chemistry of Chemical Engineering halen? Dan kun je na je vakmaster de post-master Leraar Voorbereidend Hoger Onderwijs (LVHO) doen. Met deze master kun je in één jaar je eerstegraads onderwijsbevoegdheid halen. Net als de educatie-track van de Educatie en Communicatie-master is de LVHO ook praktijkgericht met de stage als het hoofdonderdeel.

Voor meer informatie:

- [http://www.rug.nl/education/lerarenopleiding/onderwijs/lerarenopleidingalsmasternamaster/](http://www.rug.nl/education/lerarenopleiding/onderwijs/lerarenopleidingalsmasternamaster/)
C
Rules and Regulations, Addresses
**C1**

**RULES AND REGULATIONS**

Many things treated in this Study Guide are based on formal documents approved on the basis of the Higher Education Act by the Board of the University, the board of the faculty, the faculty counsel or by the Board of Examiners. In case of doubt or in case of conflicts it is advisable to refer to these formal documents. Of importance are the following.

**C1.1 STUDENT CHARTER**

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 Student Charter.

The Act stipulates that the Student Charter comprises two sections: a university-wide section and a programme-specific section.

- The *university-wide section* describes the rights and obligations that apply to the University as a whole, such as registration and protection of rights. You can find this section on myuniversity ([myuniversity.rug.nl](http://myuniversity.rug.nl)> students > regulations, complaints and participation > regulations > student 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 degree programmes. These sections include the Teaching and Examination Regulations (OER), Rules and Regulations for examinations and final assessment and other regulations and provisions set by the various degree programmes and faculties. You can consult your programme-specific section at the faculty Education Offices and in the Study Guides.

**Applicability**

The Student Charter applies to academic year 2015-2016. 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**

At the start of the academic year all students will be sent an e-mail by the Board of the University informing them where they can find the Student Charter on the internet and where they can consult a hardcopy of the Student Charter.

**Using 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. 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 University Student Desk and read the Student Charter and the associated regulations carefully.
Items in the Student Charter
The university-wide section of the Student Charter contains information on the rights and obligations of students regarding the following items:
- Admission;
- Registration and deregistration;
- Tuition fees;
- Teaching, including the binding study advice;
- Examinations and final assessments;
- Financial assistance;
- Consultative participation;
- Rules of behaviour;
- Legal rights.

C1.2 TEACHING AND EXAMINATION REGULATIONS (OER)
The Teaching and Examination Regulations is established by board and council of the faculty. It contains a number of regulations with respect to structure and content of the degree programmes, form and frequency of examinations, admission regulations, tutoring, cum laude, etc.

The OER can be found at:
- myuniversity.rug.nl/infonet/studenten/fwn/reglementen/oer-en/

C1.3 RULES AND REGULATIONS OF THE BOARD OF EXAMINERS
The Rules and Regulations of the Board of Examiners contain a number of additional regulations concerning examinations: e.g. registration for examinations, procedures for exemptions, assessment, fraud, cum laude, etc.

The Rules and Regulations of the Boards of Examiners of the degree programmes of the Faculty of Mathematics and Natural Sciences can be found at:
- myuniversity.rug.nl/infonet/studenten/fwn/reglementen/renr
C2
ADDRESSES CENTRAL BODIES UNIVERSITY OF GRONINGEN

C2.1 GENERAL ADDRESSES

Board of the University (CvB)
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 5285

University Council (U-raad)
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 8535
E-mail: uraad@rug.nl
Website: www.rug.nl/uraad

Legal Affairs Office (ABJZ)
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 5440
Website: myuniversity.rug.nl/infonet/medewerkers/organisatie/bvdu/abjz/

Donald Smits Center for Information Technology (CIT)
Visiting address: Zernikeborg, Nettelbosje 1
Postal address: P.O. Box 11044, 9700 CA Groningen, the Netherlands
Telephone: (050) 363 9200
E-mail: secretariaat-cit@rug.nl
Website: www.rug.nl/cit

CIT Helpdesk
Telephone: (050) 363 3232
E-mail: servicedesk.cit@rug.nl

Health, Safety and Environment Service (AMD)
Visiting address and postal and address: Visserstraat 49, 9712 CT Groningen, the Netherlands
Telephone: (050) 363 5551
E-mail: amd@rug.nl
Website: www.rug.nl/amd

Office of the Confidential Advisor
Marijke Dam, Confidential Advisor
Visiting and postal address:
Visserstraat 47, 9712 CT Groningen, the Netherlands
Telephone: (050) 363 5435
E-mail: j.m.dam@rug.nl
Website: www.rug.nl/vertrouwenspersoon

Complaints Committee for harassment, sexual harassment and aggressive, violent or discriminatory behavior (SIAGD)
Postal address: Antwoordnummer 172, 9700 AB Groningen, the Netherlands
C2.2 ADDRESSES FOR STUDENTS

University Student Desk (USD)
Visiting address: Broerstraat 5
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 8004
Website: www.rug.nl/insandouts
www.rug.nl/usd
or myuniversity > frequently asked questions

International Service Desk (ISD)
Visiting address: Broerstraat 5
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 8181
E-mail: isd@rug.nl
Website: www.rug.nl/isd

Student Service Centre
Visiting address: Uurwerkersgang 10
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Telephone: (050) 363 8066
E-mail: ssc-secretariaat@rug.nl
Website: www.rug.nl/ssc

NEXT Career Services
Visiting address: Uurwerkersgang 10
Postal address: Postbus 72, 9700 AB Groningen
E-mail: next@rug.nl
Website: www.rug.nl/next

Central Portal for the Legal Protection of Student Rights (CLRS)
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
Website: www.rug.nl/clrs or
myuniversity > frequently asked questions

University Funds Committee (UFC)
Postal address: P.O. Box 72, 9700 AB Groningen, the Netherlands
E-mail: ufc@rug.nl
C3

FACULTY ADDRESSES

C3.1 BUILDINGS
  Open: 8:00 – 20:00.
  Open: 8:00 – 20:00.
  Open: 8:00 – 20:00.
- **Kapteynborg** (building J, 5419): Astronomy, Landleven 12, 9747 AD Groningen; telephone secretary (050) 363 4074.
  Open during office hours, ring the bell to enter the building
- **ADL1** (buildings 3211–3217/3219): ESD, Medical Sciences, Dentistry and Pharmacy, Antonius Deusinglaan 1, 9713 AV Groningen; telephone reception (050) 363 8000.
  Open: Mon–Thurs: 8:00 – 20:30; Fri: 8:00 – 17:30.

For a map, route description and more information about the buildings, see:
- [www.rug.nl/fwn/organization/locaties](http://www.rug.nl/fwn/organization/locaties)

See Chapter C4 for maps of the buildings of the faculty.

C3.2 LIBRARY
**Central Medical Library**
Location: Hanzeplein 1, 9713 GZ Groningen
  Winkelstraat 1 or Poortweg 12, 4th floor, Y 4.202
Telephone: (050) 363 3048 and/or (050) 361 2596
E-mail: cmb@umcg.nl

**University Library Zernike**
Location: Nettelbosje 2, 9747 EA Groningen
  2nd floor of the Duisenberg building
Telephone: (050) 363 3708
E-mail: zernike-bibliotheek@rug.nl

C3.3 EXCHANGE OFFICE
**Henriëtte Mulder**
Location: Bernoulliborg, Nijenborgh 9, room 5161.0050,
E-mail: exchange.science@rug.nl

**Margriet Hulshof**
Location: Antonius Deusinglaan 1, room 3213.0017
E-mail: m.a.hulshof@rug.nl

See:
- [myuniversity.rug.nl/infonet/studenten/fwn/studeren-buitenland/algemeneinformatie/contactexchange](http://myuniversity.rug.nl/infonet/studenten/fwn/studeren-buitenland/algemeneinformatie/contactexchange)
C3.4 EDUCATION SUPPORT DESK

ESD Zernike
Location: Bernoulliborg, Nijenborgh 9, building 5161, first floor
Opening hours: 10:30 – 12:00 (all week days)
13:00 – 15:00 (not on Wednesday and Friday)
Phone: (050) 363 4422 (9.00 – 12:00 and 13:00 – 16.00)

ESD ADL
Location: UMCG, Antonius Deusinglaan 1, building 3214, ground floor
Opening hours: 12:00 – 14:00
Telephone: (050) 363 3315 or (050) 363 3343
(9.00 – 12:00 and 13:00 – 16.00)
E-mail: esc.fwn@rug.nl
C4
LOCATIONS

C4.1 ZERNIKE

Translation:
- Ingang = Entrance
- Chemie-Fysica-Milieukunde = Chemistry – Physics – Environmental Sciences – Industrial Engineering and Management – Nanoscience
- Tentamenhal = Examination building, Aletta Jacobs
C4.2 ADL

**ADL2**
Ant. Deusinglaan 2
9713 AW Groningen
phone 050 363 3270 / 8000

**Medical Sciences, Dentistry and Pharmacy (ADL1)**
Ant. Deusinglaan 1
9713 AV Groningen
phone 050 363 8000

**University Medical Center Groningen (UMCG)**