STUDY GUIDE
2016-2017

MASTER’S DEGREE PROGRAMME

BIOMEDICAL ENGINEERING

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
RIJKSUNIVERSITEIT GRONINGEN
COLOFON
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A

General part
A1 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>
<td>180</td>
<td>Computing Science</td>
<td>180</td>
</tr>
<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>
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<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>
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<th>ECTS</th>
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</thead>
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<tr>
<td>Applied Mathematics</td>
<td>120</td>
<td>Education and Communication**</td>
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</tr>
<tr>
<td>Applied Physics</td>
<td>120</td>
<td>Energy and Environmental Sciences</td>
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</tr>
<tr>
<td>Artificial Intelligence</td>
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<td>Human-Machine Communication</td>
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<td>Astronomy</td>
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<td>Industrial Engineering and Management</td>
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<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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<tr>
<td>Biomedical Sciences</td>
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<td>Molecular Biology and Biotechnology **</td>
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<tr>
<td>Chemical Engineering</td>
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<td>Chemistry</td>
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<td>Pharmacy**</td>
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<tr>
<td>Computing Science</td>
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<td>Physics</td>
<td>120</td>
</tr>
<tr>
<td>Ecology and Evolution **</td>
<td>120</td>
<td>Water Technology (Joint Degree) ***</td>
<td>120</td>
</tr>
</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, systematical, 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](http://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](http://www.evobio.eu)
- TCCM (as part of the Master’s programme Chemistry), [tccm.qui.uam.es](http://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/shp](http://www.rug.nl/fwn/shp) 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

Or contact the coordinator Vanessa van Hest:
- 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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<td>36</td>
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<td>37</td>
<td>mo. 12-09-16 - fri. 16-09-16</td>
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<td>38</td>
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<td>L3/E</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>mo. 03-10-16 - fri. 07-10-16</td>
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<td>42</td>
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<td>L1</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>mo. 14-11-16 - fri. 18-11-16</td>
<td>L2</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>mo. 21-11-16 - fri. 25-11-16</td>
<td>L3/E</td>
<td>L3/R: lectures &amp; resits &gt; 17:00 h</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>mo. 28-11-16 - fri. 02-12-16</td>
<td>L4/E</td>
<td>L4/R**</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>mo. 05-12-16 - fri. 09-12-16</td>
<td>L5/E</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>Resits 1.2</td>
<td>Examinations 1.2</td>
<td></td>
</tr>
<tr>
<td>52-1</td>
<td>mo. 26-12-16 - fri. 06-01-17</td>
<td>Vacation</td>
<td>Vacation Christmas and New Year</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>mo. 09-01-17 - fri. 13-01-17</td>
<td>L1</td>
<td>L1/R**</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>mo. 16-01-17 - fri. 20-01-17</td>
<td>L2</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>mo. 23-01-17 - fri. 27-01-17</td>
<td>L3/E</td>
<td>L3/R***</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>mo. 30-01-17 - fri. 03-02-17</td>
<td>L4/E</td>
<td>L4/R***</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>mo. 06-02-17 - fri. 10-02-17</td>
<td>L5/E</td>
<td>L5/R***</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>mo. 13-02-17 - fri. 17-02-17</td>
<td>L6/E</td>
<td>L6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>mo. 20-02-17 - fri. 24-02-17</td>
<td>L7/E</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>mo. 27-02-17 - fri. 03-03-17</td>
<td>L8/E</td>
<td>L8 (Resits AI*)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>mo. 06-03-17 - fri. 10-03-17</td>
<td>Resits 1.2</td>
<td>Resits 1.1**</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>mo. 13-03-17 - fri. 17-03-17</td>
<td>L9/E</td>
<td>Examinations 2.1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>mo. 20-03-17 - fri. 24-03-17</td>
<td>Resits 2.1</td>
<td>Examinations 2.1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>mo. 27-03-17 - fri. 03-04-17</td>
<td>L9/E</td>
<td>Resits 1.2**</td>
<td>Fri. 14-04 Good Friday</td>
</tr>
<tr>
<td>14</td>
<td>mo. 03-04-17 - fri. 07-04-17</td>
<td>L1/R**</td>
<td>Mo. 17-04 Easter Monday</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>mo. 10-04-17 - th. 14-04-17</td>
<td>L2/R**</td>
<td>L2 Th. 27-04 Kings Day</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>tu. 18-04-17 - fri. 21-04-17</td>
<td>L3/R**</td>
<td>L3/R: lectures &amp; exams</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>mo. 24-04-17 - fri. 28-04-17</td>
<td>L4/R**</td>
<td>Fr. 05-05 Liberation Day</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>mo. 01-05-17 - th. 04-05-17</td>
<td>L5/R**</td>
<td>L5</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>mo. 08-05-17 - fri. 12-05-17</td>
<td>L6/R**</td>
<td>L6 Th. 25-05 Ascension Day</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>mo. 15-05-17 - fri. 19-05-17</td>
<td>L7/R**</td>
<td>L7</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>mo. 22-05-17 - fri. 26-05-17</td>
<td>L8/R**</td>
<td>L8 Mo. 05-06 Whit Monday</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>mo. 29-05-17 - fri. 02-06-17</td>
<td>L9/R**</td>
<td>L9 (Resits AI*)</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>tu. 06-06-17 - fri. 09-06-17</td>
<td>L10/E</td>
<td>Examinations 2.2</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>mo. 12-06-17 - fri. 16-06-17</td>
<td>L11/E/R</td>
<td>Resits 2.1**</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>mo. 19-06-17 - fri. 23-06-17</td>
<td>Resits 2.2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>mo. 26-06-17 - fri. 30-06-17</td>
<td>Resits 2.2.</td>
<td>Resits 2.2.</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>mo. 03-07-17 - fri. 07-07-17</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, therefor 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 sent 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><em>ProgRESS WWW</em></td>
<td>Course</td>
<td>Yes (if available)</td>
</tr>
<tr>
<td><em>ProgRESS WWW</em></td>
<td>Exam</td>
<td>Yes (if available)</td>
</tr>
<tr>
<td><em>Nestor</em></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:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Outstanding; a remarkable performance; seldom given</td>
</tr>
<tr>
<td>9</td>
<td>Excellent</td>
</tr>
<tr>
<td>8</td>
<td>Very good</td>
</tr>
<tr>
<td>7</td>
<td>Good</td>
</tr>
<tr>
<td>6</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>&lt;6</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

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 programme 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 programme 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 “Programme”
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 then 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 (collaquium doctum);
- Establishing the number of ECTS credits earned;
- Granting of exemptions.

For more information, see the Student Portal.

Applies 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 Student Portal).

**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.fwn@rug.nl

**ESD ADL**
Location: UMCG, Antonius Deusinglaan 1, building 3214, ground floor
Opening hours: 12:00 – 14:00
Telephone: (050) 363 3315 or 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 Student Portal.

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 and Arlette van Berkel (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:
- www.rug.nl/usd
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.

For more information see the Student Portal.

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).

For more information, see the Student Portal.

You can make an appointment with a psychological counsellor via the Student Service
Location: Uurwerkersgang 10, 9712 EJ Groningen
Telephone: (050) 363 8066
E-mail: ssc-secretariaat@rug.nl

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 to 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
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 (Keuningzaal 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 any time;
- 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, Archaeology, 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/elektijdschr/

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

**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

For more information, go to the Student Portal.

**Location:**

Broerstraat 4, 9712 CP Groningen

**Telephone:** (050) 3635020 and/or (050) 3635000

**E-mail:** 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.

**Location:**

Nettelbosje 2, 9747 EA Groningen

2nd floor of the Duisenberg 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.

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 programme (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

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

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.

A4.3.4 Ocasys

- www.rug.nl/ocasys

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 study guide. 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.

A4.3.5 Schedules

- rooster.rug.nl

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.
A4.3.6 Nestor

- www.Nestor.rug.nl

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, therefor you need to be registered in ProgRESS WWW for the course (see also Section A2.4).

A4.3.7 ProgRESS WWW

- progRESSwww.nl/rug

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.

A4.3.8 Student PCs

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.

A4.3.9 Usage rules

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

- www.rug.nl/rc/security/aup

Users of the university computer systems should be aware they are not the only users of these computers. Many computers are multi-user systems, and the users of these computers belong to a community. Therefore, the ground rule on which this AUP (Acceptable Use Policy) is based is similar to the ground rule on which traffic is based: users of the University computer systems may not endanger these systems, nor may they hinder other users.

Some of the implications of this ground rule are that users are not allowed to send unsolicited e-mail or try to obtain or use other users’ passwords, either accidentally or ‘for fun’. Abusing University computer systems may result in disciplinary action!

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.
Programme Specific Information
Biomedical Engineering
B1 BIOMEDICAL ENGINEERING

THE STUDY AND AFTERWARDS

Goal of the study guide
The aim of this part of the study guide is to provide students and lecturers of the Master's degree programme Biomedical Engineering (BME) with specific information about the BME programme.

Additional information can also be found on: http://www.rug.nl/masters/biomedical-engineering/

B1.1 THE FIELD AND JOB PERSPECTIVES
Biomedical Engineering is a field at the interface of medical sciences and engineering which leads to technological applications in health care. It aims at:

- Advanced technical support in health care
- Development of resources and instrumentation for health care

A biomedical engineer has knowledge of engineering and medical science and is trained in applying that knowledge. This combination makes the biomedical engineer employable in the industrial as well as the health care sector. Within the industrial sector, biomedical engineers are responsible for the development and improvement of, for example, artificial organs, lenses, catheters, medical instruments or equipment for rehabilitation. Within the health care sector there is also demand for biomedical engineers, e.g. in applied or fundamental research, or in management. Biomedical engineers also find jobs as researchers or lecturers at universities or colleges.

B1.2 THE MASTER'S DEGREE PROGRAMME BIOMEDICAL ENGINEERING OF THE UNIVERSITY OF GRONINGEN
Students begin their academic training by following a Bachelor's degree programme of three years. Subsequently, they have the possibility to move on to a (more specialized) Master's degree programme. Within the Faculty of Mathematics and Natural Sciences (FMNS), a Master's degree programme typically lasts 2 years. The RUG offers a unique Biomedical Engineering programme, because it is supported by the expertise of own experts in both the technological field (represented by the FMNS), and the biomedical field (represented by the University Medical Center Groningen (UMCG)). BME students will be introduced to subjects on the interfaces of medical science, dentistry, (applied) physics, chemical technology, mathematics, and computer science. The formal responsibility lies with the Faculty Board of the FMNS.

B1.2.1 SPECIALIZATIONS MASTER'S DEGREE PROGRAMME BIOMEDICAL ENGINEERING
The BME programme offers three specializations:

1. Diagnostic Imaging and Instrumentation
2. Prostheses & Implant Interface Technology
3. Prostheses & Implant Design

Within the specialization Diagnostic Imaging and Instrumentation you will learn how to develop and to improve medical equipment used to visualize structures in the human body, such as x-ray, MRI-, PET- and CT scans and electron microscopy, as well as equipment which is used to visualize metabolic processes within a cell, or to measure the electronic activity in the brain. Other examples of non-imaging instruments are anaesthesia-instruments and measuring instruments for temperature, blood pressure, heartbeat.

The specialization Prostheses & Implant Interface Technology focuses on materials and interfaces of implants and endo-prostheses, which are introduced into the body with the intention of restoration of
body functions. It concerns research on existing interfaces and the design of innovative interfaces that improve the reaction with the surrounding tissue and are able to prevent implant infections. Also regenerative medicine solutions will be studied and designed.

The specialization **Prostheses & Implant Design** focuses on the design of innovative implants and endo-prostheses, which are introduced into the body with the intention of restoration of body functions. In addition, also external prostheses (to replace amputated arms, legs, hands, etc.) and orthoses (that support weakened body parts) are studied and designed.

To support Healthy Ageing, sensor systems are designed to measure a person’s physical, cognitive and mental condition and lifestyle in terms of nutrition and motion. Training systems are designed to improve a person’s condition.

### B1.2.2 Goals and teaching outcomes of the BME programme

Within the degree programme Biomedical Engineering, students can acquire knowledge, skills and insight in the field of the Biomedical Engineering, so that they are able to work independently as biomedical engineers, scientists or scientific designers.

The MSc graduate in Biomedical Engineering:
1. Has thorough knowledge of concepts, methods and techniques of biomedical engineering and is able to apply the required mathematical and computer technological methods;
2. Is acquainted with the quantitative character of engineering and has insight in the main methods used in engineering;
3. Has the ability to communicate effectively in written and verbal form about biomedical engineering and its applications, also in a multidisciplinary environment;
4. Is able to manage projects and to function in a team;
5. Is acquainted with the (technological) biomedical literature in his/her specialization, able to find relevant information in the international literature and critically judge the methodical quality;
6. Is experienced in executing scientific research;
7. Has knowledge of (for the biomedical engineering important) medical subjects and specialist knowledge of a (sub) specialization in engineering;
8. Has the capacity to diagnose and analyse medical problems, transfer them into technological challenges and develop a goal-oriented solution;
9. Is aware of potential social and ethical implications of scientific research in biomedical engineering and has the ability to critically evaluate the effects of the research carried out under his/her responsibility;
10. Recognizes the need for, and has the ability to engage in ongoing learning beyond the MSc level in a way that may be largely self-dependent.

After following the **Diagnostic Imaging and Instrumentation** specialization, students must be able to:
- conduct scientific research on the functioning of medical instruments, both from biological and physical points of view and based on a modelling approach;
- conduct scientific research on medical imaging techniques, using biological and physical insights and based on a modelling approach;
- improve diagnosis by designing prototypes of new, technologically innovative medical instruments and imaging techniques that are based on fundamental scientific research;

Furthermore, the specialization Diagnostic Imaging and Instrumentation offers students with a bachelor degree in Life Science & Technology and the courses Waves & Optics and Radiation Safety level 3, admission to the postgraduate programme ‘clinical physicist’.

After following the **Prostheses & Implant Interface Technology** specialization, students must be able to:
- conduct scientific research on the functioning of prostheses, implants and scaffolds for regenerative medicine applications, using biological, chemical and mechanical insights and based on a modelling approach;
- improve the interface of prostheses, implants and scaffolds in relation to an optimal interaction with the body, using biological, chemical and mechanical insights.
- improve the interface of prostheses, implants and scaffolds to decrease the chance of infections using biological, chemical and mechanical insights.

After following the Prostheses & Implant Design specialization, students must be able to:
- design prototypes of new, technologically innovative implants, including artificial organs or organ support systems, external prostheses and orthoses that are based on results of fundamental scientific research;
- conduct scientific research on the functioning of prostheses and implants, external prostheses and orthoses using biological, chemical and mechanical insights and based on a modelling approach;
- improve existing prostheses and implants, external prostheses and orthoses in relation to interaction with the body, using biological, chemical and mechanical insights.
- Design innovative sensor and intervention systems to measure and improve the physical, cognitive and mental condition of a person and his/her lifestyle.
B2 ORGANIZATION BME MASTER’S DEGREE PROGRAMME

B2.1 GRADUATE SCHOOL OF SCIENCE

The BME Master's degree programme is an interdisciplinary programme, supported by the Faculty of Mathematics and Natural Sciences (FMNS) and the University Medical Center Groningen (UMCG). The formal responsibility for the practical organization rests with the Faculty Board of the FMNS. Education within the FMNS is divided into an undergraduate and a graduate school. The Graduate School of Science (GSS) combines research with the teaching of Master's and PhD students, while the Undergraduate School of Science (UGS) organizes the Bachelor’s degree programmes. Postal address of the Graduate School of Science: Nijenborgh 9, 9747 AG, Groningen (For web page click here).

B2.1.1 Office of the BME Master’s degree programme

The Master’s degree programme BME is supported by the Education Support Centre of the FMNS. Please note that this information is subjected to change during the academic year. Any change will be announced via the Student Portal.

<table>
<thead>
<tr>
<th>STUDY SUPPORT</th>
<th>OFFICE HOURS</th>
<th>E-MAIL</th>
<th>TEL.</th>
<th>BUILDING/ ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme coordinator: Irma Knevel</td>
<td>Mon-Wed/Fri: 9.00 -17.00h</td>
<td><a href="mailto:i.c.knevel@rug.nl">i.c.knevel@rug.nl</a></td>
<td>8098</td>
<td>3213.009</td>
</tr>
<tr>
<td>Academic advisor:</td>
<td>Mon-Fri: 9.00 – 17.00 h</td>
<td>Click here for details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BME office: Hester Bathoorn</td>
<td>Mon-Wed/Fri: 9.00 - 17.00 h</td>
<td><a href="mailto:esc-bme@rug.nl">esc-bme@rug.nl</a></td>
<td>9142</td>
<td>3216.0107</td>
</tr>
<tr>
<td>ESC-ADL desk</td>
<td>Mon-Fri: 12.00 - 14.00 h</td>
<td><a href="mailto:esc.fwn@rug.nl">esc.fwn@rug.nl</a></td>
<td>3315/ 3343</td>
<td>3214.0048</td>
</tr>
<tr>
<td>ESC-Zernike desk</td>
<td>Opening hours: click here</td>
<td><a href="mailto:esc.fwn@rug.nl">esc.fwn@rug.nl</a></td>
<td>4422</td>
<td>5161, 1st floor</td>
</tr>
</tbody>
</table>

The core business of the Education Support Centre (ESC) is to support the teaching process within the degree programmes. This involves:

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

Websites
Student Portal BME master: click here
Education Support Centre: click here

The director of the BME master programme is:
Prof. dr. ir. G.J. (Bart) Verkerke
Room: 3215-1105B
Antonius Deusinglaan 1, 9713 AV Groningen
Tel. (050) 363 3126
g.j.verkerke@gmail.com
B2.1.2 Study association GLV Idun
GLV Idun is the association for all students of the Life Sciences programmes of the University of Groningen. Bachelor’s students of Biology, Life Science & Technology, Master’s students of Biology (and all biology-related Master’s programmes, such as Biomedical Sciences, Ecology & Evolution, Marine Biology and Molecular Biology & Biotechnology), Biomedical Engineering, and Medical Pharmaceutical Sciences will be accepted for membership.

Membership: open to all students of Life Sciences,
E-mail address: bestuur@glv-idun.nl
Telephone: 050 363 2074 or 8716
One of the duties of GLV Idun is the sale of textbooks. Members get a 16% discount on their books.

B2.2 COMMITTEES OF THE BME MASTER’S DEGREE PROGRAMME

The Programme Committee [Opleidingscommissie or OC]
Dr. M. Greuter (UMCG), chairman
Dr. A. K. Biegun (KVI)
Dr. B. Crielart (FWN)
Dr. J. Sjollema (UMCG)
Dr. A.T.M. Willemsen (UMCG)
Dr. I.C. Knevel (FMNS), secretary
Academic Advisor, advisory member
Prof. Dr. Ir. G.J. Verkerke (UMCG), advisory member
Student members: B. Bouwmeester, J. de Vries, C. van Leijsen, 2 vacancies

Contact: esc-bme@rug.nl

The Board of Examiners [Examencommissie of EC]
Dr. ir. F.W. Wubs (Chair, FMNS)
Dr. P. van Rijn (UMCG)
Dr. A.T.M. Willemsen (UMCG)
Dr. I.C. Knevel (Secretary, FMNS)

The Board of Examiners meets every 1st Tuesday of the month.
Requests to the board can be emailed to esc-bme@rug.nl.

Advisory Board
The Advisory Board assures the feedback between the professional field where the graduates will find employment and the programme. Tasks of the Advisory Board are to advise/give input to the programme regarding the capabilities the (potential) employer expects from the graduates, to advise on the learning goals of the programme, provide any sort of input that is useful for the programme, and act as a Curriculum Committee.

Members Advisory Board:
Ir. A. Wachtmeester (BMTZ) Prof. N. Maurits (UMCG)
Drs. J.W. den Boer (Umaco) Prof. P. Segers (UGent)
Drs. K. Hilverda (Philips Drachten) Prof. K. Mottaghy (RWTH Aachen)
Ir. E. Schulting (IMDS) Prof. R. Reilly (TCD)
Dr. ir. A van der Plaats (Organ Assist) Prof. V. Rogalewicz (CTU Prague)
Ir. J. Hoekstra (Pezy)

Contact: esc-bme@rug.nl
**B2.3 INSURANCE**

The University of Groningen is not liable for any costs (medical or otherwise) or damage caused by students. Therefore, students are obliged to insure themselves against accidents being the result of their own actions as for example a student’s-laboratory-accidents-insurance (*studenten-laboratorium ongevallenverzekering*). The study associations for students of life sciences can arrange this for you if you are a member. Foreign students can contact the degree programme coordinator for assistance.

**B2.4. Hepatitis vaccination**

For the course Integrated Lab Course Biomaterials (MLBMTLAB) vaccination against Hepatitis B is compulsory. You can register on ProgRESS WWW via Enrollments RUG/Mathematics and Natural sciences/Graduate school (MSc) 16-17/MSc Biomedical engineering/Hepatitis B vaccination.

**B3 STUDY AFFAIRS**

**B3.1 ADMISSION**

**B3.1.1 Bachelor degrees which guarantee direct admittance**

The following academic bachelor degrees give direct access to the Master’s degree programme BME:
- Life Science & Technology (RUG) with major Biomedical Engineering
- Physics with the track Life and Health (RUG)
- Other Dutch University BSc degree in Biomedical Engineering

**B3.1.2 Other academic Bachelor degrees**

Graduates with a Bachelor degree in
- Applied Physics
- Physics
- Electrical Engineering
- Mechanical Engineering
- Chemical Engineering

are not automatically admitted to the programme due to lack of knowledge in the field of the Biomedical Engineering. The Admission Board will determine the deficiencies of the student and recommend an individual study programme or a bridging programme.

**B3.1.3 Graduates of Universities of Applied Sciences (HBO); pre-master programme**

Graduates of a University of Applied Sciences (in Dutch: Hoger Beroeps Onderwijs (HBO)) programme, related to the field of Biomedical Engineering, are usually required to pass a Pre-master programme (or bridging programme) before they are admitted to the Master’s degree programme BME. A pre-master programme typically contains 15, 30, 45 or 60 ECTS of Bachelor courses. As there is no standard pre-master programme for HBO graduates, the Admission Board will determine the contents individually. Before the student is able to enrol for a pre-master programme, he/she has to consult the academic advisor first (see B3.2.1.).

After completion, a certificate for completing the pre-master programme will not be issued. Students who wish to receive an official document stating all passed courses, may request a transcript of records at the Education Support Desk at any time, free of charge.

The specializations Electrical Engineering, Applied Physics, Mechanical Engineering and Medical Technology are examples of BME-related HBO-specializations. Admission to the Master’s degree programme Biomedical Engineering, or to a pre-master programme, is always judged individually by the Admission Board.
B3.2 STUDY GUIDANCE

B3.2.1 Academic advisor
Not all students will reach the end of their degree programmes without encountering problems. Successful study depends on many different factors, and it is therefore understandable that students sometimes need to consult an impartial expert. The task of the academic (or study) advisor is to assist students in finding solutions to any problems encountered while studying. In practice, this concerns matters like the choice of programme, study pace or an improvement in study methods. Problems of a more general nature (e.g. the financial consequences of study delay) are often dealt with by consulting the university student counsellors. Social matters can also be discussed with the academic advisor, if students need a confidant for personal problems. In some of these cases, the academic advisor will recommend the more specialized assistance of, for example, the student psychologists. Note that the academic advisor has an independent role, and works under a professional privacy-code, meaning that all conversations remain confidential.

The academic advisor for BME is Mirjan van Timmeren. If you have a question or want to discuss your programme you can contact the study advisor in several ways:

1. Send an email (m.m.van.timmeren@rug.nl)
2. Short question (<10 min) can be handled during open office hours. Please note that this can (only for short questions <10 min).

Open office hours Tuesday: 11:00-12.30 h - Location ADL room 3213.0015
3. For longer questions you can book an appointment yourself via https://mmvantimmeren.youcanbook.me/.

These open office times may change during the academic year; please consult Student Portal for the most up-to-date open office hours.

Study programme
All students need to hand in a Study programme to the Board of Examiners, prior to the academic year. Deadline for handing in Study programme: 28 September 2015 (see also Chapter B4.3.3).

If you have suffered from study delay during the first year, or if you don’t wish to follow the advertised time table choices, you should first contact the academic advisor and discuss your plans, before submitting your programme proposal to the Board of Examiners. The form that needs to be used to send in your programme proposal can be downloaded via the student Portal Biomedical Engineering. If you fail to ask prior permission to the Board of Examiners, you take a big risk as your courses may be rejected at the time of graduation, meaning you cannot graduate! So make sure you plan ahead and discuss things regularly with your mentor.

Study delay
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 (click here).

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 will be 15 ECTS or more. You will have to make an appointment with a student counsellor for a follow-up report yourself.
If during the academic year the delay (caused by circumstances beyond your control) amounts to 15 ECTS or more, you must contact a student counsellor immediately, even if you have not been told to by the academic advisor. You must follow the advice of and the agreements made with the academic advisor and the student counsellor, to prevent not being eligible for financial support from the Graduation Fund. Apply in good time for financial assistance: if you are too late, you will not receive any financial compensation.

**B3.2.2 Study mentor**

The study mentor is an experienced scientist working within the scientific domain of the master programme. The mentor guides the student throughout the whole master programme from the first module through the graduation ceremony. In this way the mentor ensures, in collaboration with the Board of Examiners, that the learning outcomes related to specific knowledge and skills are met. A study mentor advises you on the contents of your programme and the choices you have to make to prepare for a professional career after graduation.

Before you start, you will have to choose a study mentor. Most students will choose a mentor from the research area in which they intend to perform their research project (Possible research groups can be found under the Student Portal. In order to choose, students must define their field of interest, and thereafter, investigate the research group to which a potential supervisor belongs. We advise you to visit the website of the research groups, read recent scientific articles and get a feeling for the area of activity of the group you hope to be a part of.

You are solely responsible for making a first appointment and maintain contact with your mentor during your master’s programme. Choose your mentor from the list below, send him/her a request to be your mentor, and mail the result to: esc-bme@rug.nl.

**List of Study Mentors and their Expertise**

- prof. dr. P. van Dijk, [p.van.dijk@umcg.nl](mailto:p.van.dijk@umcg.nl) (hearing)
- dr. M.J.W. Greuter, [m.j.w.greuter@umcg.nl](mailto:m.j.w.greuter@umcg.nl) (radiology)
- dr. M.C. Harmsen, [m.c.harmsen@umcg.nl](mailto:m.c.harmsen@umcg.nl) (tissue engineering)
- dr. T.G. van Kooten, [t.g.van.kooten@umcg.nl](mailto:t.g.van.kooten@umcg.nl) (biocompatibility of biomaterials)
- prof. dr. H.C. van der Mei, [h.c.van.der.mei@umcg.nl](mailto:h.c.van.der.mei@umcg.nl) (infection of implants)
- dr. R.J. Renken, [r.j.renken@umcg.nl](mailto:r.j.renken@umcg.nl) (MRI)
- prof. dr. Ir. G.J. Verkerke, [g.j.verkerke@umcg.nl](mailto:g.j.verkerke@umcg.nl) (prostheses, orthoses and implant design)
- dr. ir. A.T.M. Willemsen, [a.t.m.willemsen@umcg.nl](mailto:a.t.m.willemsen@umcg.nl) (nuclear medicine)

**Responsibilities of a mentor**

- Your mentor is the final assessor of the Internship and the Master’s Project. He/she has the final responsibility for the grade, based on the evaluation of the daily supervisor.
- Your mentor will give you substantive advice about the Internship and MSc Project, and will share his/her contacts both in the Netherlands and abroad.
- Your mentor will check if your MSc and Internship proposals are complete, and sign them.
- Your mentor will check your seminar reports and sign them.
- Your mentor can give you advice about your study programme (in addition to the academic advisor).
- You can contact your mentor if you have (academic) problems.
- You can contact your mentor if you would like to have advice about your future career.
B4 TEACHING PROGRAMME

B4.1 GENERAL INFORMATION

B4.1.1 Course duration
The Master’s degree programme Biomedical Engineering is a two-year degree programme in accordance with the Higher Education and Research Act (Wet op het Hoger onderwijs en Wetenschappelijk onderzoek (WHW)).
A successfully passed examination entitles to an academic degree of Master of Science (M.Sc.) in Biomedical Engineering and the Dutch academic degree of engineer “ingenieur” (Ir.).
The Master’s degree programme that is described in this chapter, is meant for students who start the degree programme in September 2013. For students who have begun in a previous year, in principle the programme described in the OER of that year is applicable.

B4.1.2 Year calendar: Semesters and periods
An academic year is divided in two semesters. Every semester is divided in two periods. For the academic year 2016/2017, the dates of the semesters and the periods have been determined as specified in the presented in Chapter A2.2 Academic calendar.

B4.1.3 Credits
The study load of the programmes is expressed using the European Credit Transfer System (ECTS), a way of measuring and comparing learning achievements used throughout the European Union. 1 ECTS credit point is equivalent to a study load of 28 hours. The curriculum of one academic year comprises of 60 ECTS credit points.

B4.2 PROGRAMME ITEMS

B4.2.1 Overall composition of the programme
The BME-programme is full time and consists of 120 ECTS.
The components of the programme are:
1. general courses in the first year
2. specialization courses in the second year
3. an external internship (15 ECTS) and
4. a Master’s project consisting of a scientific research or design project (35 ECTS)

During the periods of the Master’s project and internship, a student has the chance to put their theoretical knowledge into practice. Students often work in one of the research groups of the RUG or UMCG during the Master’s project, but they may also work in a company. The external internship has to be conducted in industry or in a hospital.
B4.3 PRACTICAL ORGANIZATION OF THE PROGRAMME

B4.3.1 Course information
Information about the courses can be found on www.rug.nl/ocasys. General time tables are published on the Biomedical Engineering Student Portal. Day-to-day time table schedules may be downloaded via http://roosters.rug.nl. Information about the elective course “Radiation Safety” can only be found below. The course is a national course and only taught in Dutch. The courses cannot be found on Ocasys.

Radiation Safety (only in Dutch - syllabus on request available in English)
This is a course, for which the RUG department of Health, Safety and Sustainability bears responsibility and for which the learning outcomes are determined on the national level. Hence no information can be found on Ocasys. If you wish to attend Radiation Safety, this is your own responsibility. The course will be taught in block Ib, Iia (practicum) and Iib (exam). Make sure you plan your Master project well to minimize interference with the course. If you plan to go abroad for your Master's project, you will not be able to attend the Radiation Safety course.

Coordinator: Dr. H.F. Boersma (phone 050 363 6124, email: h.f.boersma@rug.nl)
Instructor(s): Dr. H.F. Boersma

Entrance requirements: Radiation Physics
Semester: Ib, Iia, Iib

Learning goals: To acquire, in addition to the Radiation Physics course, knowledge needed to meet the requirements of Dutch legislation to qualify for 'radiation protection expert' ('Coördinerend stralingsbeschermingsdeskundige', formerly known as 'level 3 expert'). This level of expertise is mandatory in the Netherlands, for those who are responsible for the radiation safety of larger applications of ionizing radiation (isotope laboratories, large (numbers of) sealed sources, X-ray machines and simple accelerators). The course also aims to provide adequate knowledge in the field of radiation safety, which is necessary for some medical professions, especially for medical physicists. This level of expertise is the minimum level needed to act as a registered Radiation Protection Expert in the Netherlands.

Textbooks and other resources: Literature will be provided (€100,-) Syllabus “Cursus Coördinerend Stralingsbeschermingsdeskundige I & II” – RUG Practicumhandleiding Handboek Radionucliden Pocket Calculator Casio FX-82

Course topics: Relevant knowledge in the fields of radiation biology and genetics is provided. Principles of internal contamination with radioactive isotopes and its health effects are discussed (internal dosimetry). Relevant Dutch legislation and rules are presented, along with the necessary information to apply for licenses. Exercises focus on internal dosimetry and the application for licenses. The practical work treats all relevant aspects of radiation safety in practice (interaction of ionizing radiation with matter, shielding, decontamination, isotope identification, risk communication etc.). A complete test examination is offered. Successful completion of the Radiation Physics course is assumed.

Method of instruction: Lectures, tutorials and practical
Type of assessment: Nationally coordinated exam and reports of practical work
Study load: 3 ECTS + 2 ECTS (practical assignments).

Roosterwijzigingen voorafgaand aan de opleiding worden op onze website geplaatst, eventuele roosterwijzigingen tijdens de opleiding worden zoveel mogelijk per e-mail doorgegeven en indien mogelijk ook geplaatst op onze website. Let er wel op dat het rooster op de website het volledige rooster van deze opleiding is. Van de student wordt verwacht dat hij in de periode tussen 6 januari 2017 en het college 'Maatschappelijke aspecten' op dinsdag 28 maart 2017 een
casus uitwerkt waarin onder meer ervaring met het uitvoeren van risico analyses wordt
opgedaan en waarin een korte presentatie en/of voorlichtingstekst wordt voorbereid. Deze
uitwerking dient met een voldoende te worden beoordeeld.
Het bijwonen van de colleges op dinsdag 28 maart 2017 is verplicht. Ook is het bijwonen van de
introductiebijeenkomst op 6 januari 2017 verplicht.

**Maximum aantal studenten:** 4; met een mogelijke uitleg naar acht, afhankelijk van de
beschikbaarheid van het practicum.

**Deadline aanmelden:** Voor definitieve aanmelding is woensdag 16 november 2016. Je kunt je voor
dit vak aanmelden door het invullen van het aanmeldingsformulier. Beschikbaar via
amd@rug.nl of de webpagina van deze opleiding. Voor nadere informatie over het vak kan
contact met de coördinator worden opgenomen (h.f.boersma@rug.nl, tel.050-3636124).

**B4.3.2 Time schedule 2016-2017**
Please:
- Be aware that scheduling is only guaranteed if you follow only first year OR second year courses. It is
  your own responsibility if you wish to attend both first and second year courses in the same academic
  year: time table clashes may occur.
- Note that the Study Guide version of the year schedule might be subject to change (see the Biomedical
  Engineering Student Portal for up-to-date version of the schedule).
- Note that following other courses than the electives mentioned in the schedule is possible, however, you
  have to ask permission from the Board of Examiners and scheduling of the courses is not guaranteed.
  Please consult the academic advisor (for contact details see here) beforehand when you plan to deviate
  from the course schedule on the next pages.
Course schedule: 1st Semester (period Ia and Ib)

<table>
<thead>
<tr>
<th>Week no.</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
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<td>7 14 21 28 5 12 19 26 2 9 16 23 30</td>
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</tbody>
</table>

**Schedule 2016-2017**

**1st year: General Courses**
- **Biomaterials 2**: Technology & Ethics
- **Modelling and Simulation**: Radiation Physics OR Engineering & Biotribology
- **Control Engineering**: Mechatronics

**1st year: CEMACUBE**
- **Biomaterials 2**: Technology & Ethics
- **Modelling and Simulation**: Neuromechanics OR Imaging Techn. Radiology 1
- **Basic Biomedical Knowledge 1**: Basic Biomedical Knowledge 2

**2nd year: Specialisation Courses - Diagnostic Imaging & Instrumentation**
- **Physics in Nuclear Medicine**: Medical Physics in Radiation Oncology
- **Magnetic Resonance Physics**: Image Processing
- **Imaging Techniques in Radiology 2**: Preparation MSc Project

**2nd year: Specialisation Courses - Prostheses & Implant Interface Technology**
- **Interface Biology**: Recent Development in Biomaterials
- **Surface Characterisation**: Colloid & Interface Science
- **Integr. Lab Course in Biomaterials**: Preparation MSc Project

**2nd year: Specialisation Courses - Prostheses & Implant Design**
- **Robotics**: Neuromechanics
- **Interface Biology**: Prosthetics and Orthotics
- **Product Design by FEM**: Preparation MSc Project

**Important dates period Ia and Ib**

**Year 1:**
- 2 Sep. 2016: Introduction Master FWN Zernike
  - Room: Bernoulliborg hall 5161.151
- 6 Sep. 2016: Introduction: 12.00 - 15.00h
  - Room: See [http://rooster.rug.nl](http://rooster.rug.nl)
- 30 Sep. 2016: Deadline Study Programme Proposal

**Year 2:**
- 6 Sep. 2016: Introduction for 2nd year: 15.00-17.00h
  - Room: See [http://rooster.rug.nl](http://rooster.rug.nl)
- 13 Dec. 2016: BME Winter symposium: 12.00 - 17.00h
  - Room: See [http://rooster.rug.nl](http://rooster.rug.nl)
- 30 Nov. 2016: Deadline Master project proposal
- 30 Nov. 2016: Deadline Abstract Winter symposium
Course schedule: 2\textsuperscript{nd} Semester (period IIa and IIb)

<table>
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<tr>
<th>Year 2017</th>
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<tbody>
<tr>
<td><strong>February</strong></td>
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<td>Week no.</td>
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<td>Monday</td>
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</table>

**Schedule 2016-2017**

**1st year: General Courses**
- Interdisciplinary Project
- Biomedical Instrumentation 2
- Stat. Meth. in Physics OR Scientific visualization

**1st year: CEMACUBE**
- Interdisciplinary Project
- Biomedical Instrumentation 2
- Stat. Meth. in Physics OR Scientific visualization

**2nd year: Specialisation Courses - Diagnostic Imaging & Instrumentation**
- MSc Project

**2nd year: Specialisation Courses - Prostheses & Implant Interface Technology**
- MSc Project

**2nd year: Specialisation Courses - Prostheses & Implant Design**
- MSc Project

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**Important dates period IIa and IIb**

**Year 1:**
- 15 March 2016 \hspace{1cm} Deadline Internship Proposal

**Year 2:**
- 3 April 2017 \hspace{1cm} Deadline Midterm review
- 5 June 2017 \hspace{1cm} Deadline Abstract Summer symposium
- 20 June 2017 \hspace{1cm} BME Summer symposium: 9.00 - 17.00h  \hspace{1cm} Room: See [http://rooster.rug.nl](http://rooster.rug.nl)
B4.3.3 Study Programme proposal
At the start of your master programme you will need to fill in a Programme proposal. The form that needs to be used to send in your programme proposal can be downloaded at the BME Student Portal (see Study Programme Proposal). You need to hand in your proposal by email to esc-bme@rug.nl before the deadline of: 30 September 2017.

The programme proposal will be examined by the Board of Examiners and you will receive a message when your programme proposal is approved. If during your master you want to change your Programme proposal, you will need to adjust your most recent proposal and motivate on the proposal why you want to change your programme. Note that you need to do that before the change will take place. You send the request for the change in your programme to the Board of Examiners (esc-bme@rug.nl) for approval.

If you fail to ask prior permission to the Board of Examiners, you take a big risk as your courses may be rejected at the time of graduation, meaning you cannot graduate! So make sure you plan ahead and discuss things regularly with your mentor.

B4.3.4 Seminars (previously called: Colloquia)
A Seminar refers to a scientific discussion, seminar or a symposium. In practice you may consider it as a presentation of a scientist (staff members and guest lecturers) about a specific topic. All students in the Master’s degree programme Biomedical Engineering have to follow 8 BME-related seminars. Seminars are not regularly scheduled, so it is the responsibility of every student to actively search and participate in seminars, and that he/she has successfully followed the 8 seminars at the time of diploma application.

The following rules and guidelines apply to the organization and implementation of the seminars in the programme:

- You are encouraged to start attending seminars already in the first year. This way, you are sure that you will be able to attend 8 seminars (8 points) during your master.
- Seminars are usually advertised by research groups or institutes. Some seminars are announced on the BME Student Portal (Seminars), but you are encouraged to find suitable seminars yourself.
- The topics of the seminars should be BME-related. Or more specific: the topic should be about scientific research in the field of BME, preferably with enough engineering content, e.g. it is not the purpose to follow 8 seminars about ‘gender issues in BME’. If you are unsure whether a certain topic may count as a BME seminar, please ask the coordinator beforehand (i.c.knevel@rug.nl).
- An advertised seminar counts as 1 point. Other possibilities to reach 8 seminar points: The lecture of the invited keynote speaker on the BMT symposium counts as 1 seminar point. A BME-related scientific congress can also count for seminar points: every half day counts as 1 seminar point. So participation in a 2-day fulltime scientific congress may count as 4 seminar points.
- Presentations given by MSc students or PhD students about the progress of their research projects are not valid seminars.
- Students need to prove that they participated in the seminars. That is why students have to write a short report (half- A4 page minimum per seminar point (font size 10)) about the contents of the seminar. In case of participation in a scientific congress, a short summary of the talks in a half-day session should be written. The report should be signed by your mentor, and you can email the scanned report to esc-bme@rug.nl or handed in the original at the ESC desk or Letter box. Please do not forget to mention you name and student number on the report.
- Upon application for your diploma, your seminar reports will be checked by the Board of Examiners. When you cannot prove that you have participated in 8 seminars, you won’t be able to graduate.
B4.3.5 Internship

Note: The most up-to-date version of the guidelines can be found on the BME Student Portal!

The internship is an opportunity to put acquired knowledge into practice and gather experience in the professional setting of either a company or hospital. For students with a background in applied sciences (in Dutch: HBO) it is also possible to conduct a research project at one of the research groups of the university or to extent their Master’s Project by 10 ECTS. Please note that internship and Master’s project should not be performed with the same daily supervisor. So choose your internship wisely! An important goal of the internship is to practice various skills that are needed to finish a project successfully: planning, data collection, analysis, writing and presentation. The topics chosen are usually not technically risky, so that a clear result is likely. An internship comprises the following phases:

1. Planning and preparation: Students start discussing the project with their supervisors (daily supervisor and mentor), read relevant literature. In case of a design project: perform the analysis phase and make a planning.
2. Data collection and analysis: Data will be collected according to the agreed research plan. In case of a design project: perform the syntheses phases.
3. Presentation: Towards the end/at the end of the internship, an oral presentation is given to your colleagues. (see Chapter 5 for guidelines on how to present)
4. Report: Results will be presented in a report. (see Chapter 5 for guidelines on how to make a good report)

The following guidelines apply to the organization and implementation of the internship:
- The internship should be performed at a company or hospital.
- The internship is conducted under the direct supervision of a daily supervisor and one of the mentors appointed by the Board of Examiners. A list of mentors can be found in this study guide and on the BME Student Portal.
- Start orientating and arranging your internship as soon as possible, at least half a year in advance. It might take much time to find a place, a mentor and an external (company) supervisor.
- Fill in the Internship Application form (See Internship at the BME Student Portal), let it be signed by your mentor and send it to the programme coordinator before the deadline of: 15/3/2017.
- Please formulate the research question or goal of your internship project. Describe the methods that you are going to use and why. You could even speculate about possible outcomes or pitfalls. In short, show us, that you know what you are going to do. Formulate in your own words, but use formal language. Also include a time planning per week. Notice the following rule: 15 ECTS equals 15*28 hours study load (420 hours), divided by the 40 study hours of a full time week gives 10.5 weeks of fulltime work load.
- Regular progress meetings with the daily supervisor will take place, in which the student will be given clear feedback on his or her progress. The student also should send the mentor an update at least every four weeks.
- The report should be written in English. For an exemption, approval by the Board of Examiners is necessary.

Assessment of the Internship

An assessment form is used to mark the internship and is signed by two assessors, the mentor and the daily supervisor. The assessment form can be found on the BME Student Portal (Assessment form). Your mentor is always the first assessor. The assessment will be based on the advice of the second assessor (the daily supervisor) about the daily performance of the student, the final report and the oral presentation given in the group/company of the daily supervisor.

This assessment form is completed and discussed with the student. After signing by the mentor and daily supervisor, the assessment form also serves as evidence for passing the internship. Therefore, the original form needs to be handed in at the ESC desk at ADL. There is a Letter box available for handing in forms when the desk is closed.

In case of a research project the emphasis in the assessment is on the scientific research skills of the student. The supervisors assess the research carried out on the extent to which the student was able to formulate a hypothesis, did preliminary literature-search, proposed a research method and planned to
carry it out. In addition, the student is judged on how he/she was able to communicate on the research undertaken and the results obtained. Key points covered in the assessment of the report/presentation are:

- Is the design and content of the report academically sound – in other words, is there a clear line leading from the introduction to the research question and via materials and methods and findings to conclusions/discussion?
- Is there an effective division into introduction, materials and methods, findings and conclusions/discussion?

In case of a design project the emphasis in the assessment is on the way the methodical design process is followed in terms of all steps of the analysis and synthesis phases.

Both types of reports will be assessed using the following criteria (see Chapter 5):

- Is the report well presented? Does it have a clear structure? Are the figures etc. clear? Is the text understandable for other BME-students?
- Are the separate parts well organized in terms of content? (i.e. are the arguments well-structured and substantiated?)
- Are the bibliography and appendices complete?

**B4.3.6 Master’s project**

*Note: The most up-to-date version of the guidelines can be found on the Student Portal!*

The Master’s project generates the experience in each of the stages of research or design: planning, data collection, analysis, synthesis (in case of a design project), writing and presentation. A Master’s project, whether it is a research or design project, comprises the following phases:

1. Planning and preparation of research: Students start discussing the project with their supervisor, read relevant literature. For a design project the analysis phase is performed. Write a literature review and methodological planning of the research or design project.
2. Data collection and analysis: Data will be collected according to the agreed research plan. For a design project the synthesis phases are performed.
3. Presentation: Towards the end/at the end of the research project an oral presentation is given to a scientific audience (usually the research group).
4. Report: Results will be presented in a report.

The following guidelines apply to the organization and implementation of the Master’s project:

- The Master’s project may be performed externally (in a research group not directly related to the School of Life Sciences or the UMCG, outside the university or abroad in a company or hospital).
- Internship and MSc project should be performed in different research groups.
- The Master’s project is conducted under the direct supervision of one of the mentors appointed by the Board of Examiners. A list of mentors can be found in this study guide.
- The Master’s project report should be written in English. For an exemption approval by the Board of Examiners is necessary.
- Before your project: Start orientating and arranging your Master’s project as soon as possible, preferably at the end of the 1st year. Please approach a supervisor, whose work is appealing to you and ask if (s)he is willing to supervise you. Just as during your internship you need 2 supervisors, your mentor and the daily supervisor from the group where you perform your project.
- Fill in the application form for the Master’s project (Student Portal: Application form). The form needs to be signed by your mentor and your supervisor. A scan of the signed form can be emailed to esc-bme@rug.nl. Deadline handing in master project form: **30 November 2016**.

Please formulate the research question or goal of your Master’s project, describe the methods that you are going to use and why. You could even speculate about possible outcomes or pitfalls. Formulate in your own words, but use formal language. Also include a time planning per week. In short, show us, that you know what you are going to do.

Notice the following rule: 35 EC stands for 35*28 hours study load (980 hours), divided by the 40 study hours of a full time week gives 24.5 weeks. Of the 35 ECTS, 5 ECTS is preparation, and 30 * 28 h = 840 h = 21 weeks is for the actual project performance.

- Regular progress meetings (at least every four weeks) with the daily supervisor will take place, in which the student will be given clear feedback on his or her progress. In case of an external project the student should send the internal supervisor an update at least every four weeks.
- Propose your master’s project proposal with a poster presentation (size A1) on the BME Winter (or Summer) Symposium. In case of a research project, present the research question(s) and your strategy to answer these questions. In case of a design project, present the analysis phase. In both cases you should include a realistic time planning. Let your supervisor read the abstract before your hand it in!
- Halfway through the project, the daily supervisor will need to complete a Midterm review/assessment in the presence of the student. The purpose of this meeting is to discuss the progress of the project, to give and get feedback at an early stage of the project and identify problems. The midterm assessment form can be found on the BME Student Portal (Midterm review/assessment). Send the filled in and signed form to esc-bme@rug.nl or put it in the ESC-ADL letter box. The form will be forwarded to the programme coordinator to be included in the records of the Board of Examiners.
- Present your Master’s project progress on the second BME Summer (or Winter) Symposium. Make sure you give a clear overview of everything you have done so far, including obtained results and conclusions, and eventually your further plans or implications of this project for the future. Please invite your supervisor(s) to attend your presentation at the symposium and let them read the abstract before your hand it in! Please note that the presentation at the second Symposium does not replace the final project presentation.

Symposia dates
- Winter symposium: 13-12-2016 | **Deadline** handing in abstract: **30-11-2016**
- Summer Symposium: 20-6-2017 | **Deadline** handing in abstract: **5-6-2017**

- Please note:
  - **Presenting on both symposia is mandatory.** A final mark for your project will only be issued and processed after you have fulfilled all your presentation duties.
  - All abstracts should be handed in **before the deadline** (see above), to prevent being excluded for participation and subsequent study delay.
  - You are expected to attend the whole programme of the winter and summer symposium.
  - Duration presentations: Poster presentations are 5 min and the oral presentations 15 minutes presentation and 5 minutes discussion.
  - Printing costs poster are paid for by the research group.

**Important deadlines** during your master:

<table>
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<th>Year</th>
<th>Type of form/abstract</th>
<th>Deadline</th>
<th>Who needs to sign the form:</th>
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<td>30 September 2016</td>
<td>Mentor and Supervisor</td>
</tr>
<tr>
<td>1</td>
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<td>15 March 2017</td>
<td>Mentor and Supervisor</td>
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<td>2</td>
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<td>3 April 2017</td>
<td>Supervisor and student</td>
</tr>
<tr>
<td>2</td>
<td>Abstract Summer symposium</td>
<td>5 June 2017</td>
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You can send (a scan of) your proposal/application form(s)/abstract(s) before the deadline to esc-bme@rug.nl or hand it in at the ESC-Desk/Letter box.

**Assessment of the Master research project**
The Master Assessment form is used to mark the research project and is signed by two assessors, the mentor and the (daily) supervisor. The mentor is always the first assessor. The assessment will be based on the advice of the daily supervisor about the daily performance of the student, the final report and the oral presentation given in the group of the daily supervisor.

**How to get the Assessment form?**
Supervisors can request the form by email (esc-bme@rug.nl) or collect the form at the ESC-ADL or ESC-Zernike Desk during opening hours or (see Chapter A2.1.1). The original assessment form needs to be handed in at the ESC-ADL desk or in the letter box at the ESC desk (outside opening hours).

To complete the student’s dossier for the Board of Examiners, your final report should be uploaded according to the instructions on the BME Student Portal (see here).
In case of a research project the emphasis in the assessment is on the scientific research skills of the student. The supervisors assess the research carried out on the extent to which the student was able to formulate a hypothesis, did preliminary literature-search, proposed a research method and planned to carry it out. In addition, the student is judged on how he/she was able to communicate on the research undertaken and the results obtained. Key points covered in the assessment of the report/presentation are:
- Is the design and content of the report academically sound – in other words, is there a clear line leading from the introduction to the research question and via materials and methods and findings to conclusions/discussion?
- Is there an effective division into introduction, materials and methods, findings and conclusions/discussion?

In case of a design project the emphasis in the assessment is on the way the methodical design process is followed in terms of all steps of the analysis and synthesis phases.

Both types of reports will be assessed using the following criteria:
- Is the report well presented? Does it have a clear structure? Are the figures etc. clear? Is the text easy to read?
- Are the separate parts well organized in terms of content? (i.e. are the arguments well-structured and substantiated?)
- Are the bibliography and appendices complete?

Moreover, the project will be assessed during the:
- Midterm assessment
- BME Winter Symposium
- BME Summer Symposium
- 8 Seminars

**B5 GUIDELINES: REPORTING AND PRESENTATIONS**

*Note: The most up-to-date version of the guidelines can be found on the BME Student Portal!*

**B5.1 REPORT GUIDELINES**

The following guidelines are applicable to the report you will have to write both for the Internship and the Master project (unless otherwise mentioned).

The report should contain (explained in more detail below):
- BME standard Title page
- Table of Contents
- Abstracts
- Introduction
- Method
- Results
- Discussion
- Ethics paragraph (only in case you do a Master project)

**Title page.** This is the first page of the report (before the contents) and should contain the following information:
- Title of your project
- Your full name and student number
- Name and address of the department/company where you carried out the project
- Time period of your research
- Project type (Internship or Master project)
- Your supervisor (name, function and department/company)
Your mentor (name, department/research group). You need to use the BME title page format. A word file of the BME Title page format can be downloaded from the Student Portal.

Example filled in BME Title page:

MECHANICAL BEHAVIOUR OF A NOVEL NON-FUSION SCOLIOSIS CORRECTION SYSTEM

Full name student
S1234567

Dept. of Biomechanical Engineering
University of Harderwijk
the Netherlands

Period: 02/02/2015 - 03/07/2015

Internship

Supervisor: Richard E. Searcher, Dept. of Biomechanical Engineering
University of Harderwijk

Mentor: A.H. Mentor, UMCG, Department ABC
The title should informative and to the point; avoid unnecessary frills ('Some contributions to the knowledge of...’ etc.). If necessary, use a subtitle. The sources for any figures on the title page should be reported on the inside page.

Table of contents. Make sure that the page numbers in the text are correctly listed in the table of contents (All text editing programs have an automated function. It is worth checking them out!). If necessary, you can subdivide chapters into sections and subsections, but avoid a three or four-step subdivision.

Abstract. This is a very brief summary of the essence of the report (about 200 words). Stick to the main points and avoid too much detail. Shortly describe the topic, the method, the results and the implications. An example is presented on the Student Portal.

The literature cited should appear in a bibliography. A preface/afterword and/or appendices are optional. Before you start with the full report, make an outline and discuss it in detail with your supervisor! Hopefully, this will save you the disappointment of having to radically restructure.

Ethics paragraph Conclude your Master's project with an Ethics paragraph. Ethics review becomes a (legal) requirement in doing research. Reviewers want to know whether researchers understand the ethical consequences and societal impact of their research. The paragraph should be approximately 500 words and should contain information on the societal impact and the key ethical issues should be identified. In order to write your ethics paragraph, use the ethics check list (see BME Student Portal). For the Internship, an ethics paragraph is not compulsory.

In case of a research project:
- Introduction to the research question
- Materials and methods
- Results
- Discussion and conclusions

Introduction: Here you should work from the literature towards the research question, using all the information that is relevant to your argument. A good way to structure your introduction is to focus gradually on your particular research topic against a background of the broader research area. The research question will then follow logically from the introduction. Formulating a good research question is not easy. This should occur naturally to the reader as a result of your presentation of the known facts. The research question can be of a purely exploratory nature, or the arranging of known facts can produce a hypothesis to be tested in your research. It is then important to predict as accurately as possible the outcome of the research on the basis of this hypothesis.

Materials and Methods: Here you explain how the experiments were designed, what the experimental set-up was and how they were carried out. Use figures to supplement, shorten or clarify the text. If it is relevant (e.g. because of seasonality), you should state when the experiments took place (refrain from describing your log in terms of time investment). Demonstrate clearly (perhaps with an example) how and in what form you collected and processed your data. Describe the statistical approach you used. Be meticulous about your statistical approach. Report the number of measurements, the margins of error and whether certain trends or differences are significant. If your experimental set-up and methodology differed from the literature, you must describe them in detail. If you used established methods, a brief description, with a reference to the literature, will suffice.

Results: Present the findings in brief using figures and tables. Emphasize the points that relate to the research question, first the main points and then any interesting details. Figures and tables form the basis of this part of the report. Present the results point by point and in a logical sequence. Avoid giving the same information twice in a different form. Generally speaking, tables should be used to make numerical comparisons and graphs to show or compare trends. Be aware that an interpretation is already inherent in the way in which you present and summarize the findings. This is where your conclusion begins to take shape.
Conclusions and discussion: First of all, take a positive global look at the results, and only then go into detail. State explicitly the conclusions arising from the results and discuss or substantiate them from the literature. Distinguish between direct conclusions and further interpretations. You may also point out positive or negative aspects of the method used, and explore the question as to why you arrived at these particular findings and whether they match your expectations. Finally, you may make recommendations for further research. You can draw conclusions from the results, stating your arguments for doing so. Where possible, test the conclusions against your own expectations or the literature, being as specific as possible. Argued speculations may be included, but avoid risky suggestions or vague assumptions.

If the results do not confirm your hypothesis, don’t immediately assume all manner of vague ‘errors of measurement’ or ‘inaccuracies’ (nor should you do so if the findings do match your expectations). If there is a specific reason for this, try to assess the effects of a particular error or anomaly on your results. Do not immediately start to qualify the results in favour of the hypothesis. If you have measured properly, accurately and reliably, your results are facts; the hypothesis was only an intellectual construct.

Bibliography: This should contain all the cited literature. Bibliography programs such as Endnote or Reference Manager do make your life easier. Follow the conventions used in recent editions of reputable journals.

Appendices: It may be useful to include the raw data as appendices to the report. This allows the reader to check your results or to process them in some other way. Present the raw data in the form of graphs and tables that are referred to in the report. Each appendix should have an identifying number or letter and a heading.

Preface/Afterword/Acknowledgements (optionally): This is where you state the reasons for or objectives of the research which are not part of the academic objective; words of thanks, etc.

Content
You must pay attention to language use, ease of reading (not too many repetitions, clear and unambiguous sentences, etc.) and consistent subject-verb agreement. You should also consider the academic content of the Introduction, Materials and Methods, Results and Discussion:
- Have you included everything required to answer the research question?
- Have you made any claims that are not related to the research question, or that cannot be supported by demonstrable findings?
- Are the text/figures/tables clear and unambiguous?
- Are your arguments organized in a manner that is academically convincing?

In case of a design project:
- Analysis phase
- Synthesis phases
- Discussion and conclusions

Analysis phase: Discuss the problems to be handled and summarize it in a cause-effect diagram. Formulate the goals of the product that you are designing (so not the goal of the project). Describe possible strategies for realising the product that solves the problem. Select the best one, this is your design assignment. Mention the deliverables of the project and the patient group that you focus on. Formulate requirements and wishes and finally formulate the functions that need to be performed by the product.

Synthesis phase: Find out how the functions that you have defined can be realised. For every function you have to create ideas. These ideas can be summarized in a morphological scheme. Selecting one idea for every function and combining them will result in pre-concepts. Different selections of ideas will give you different pre-concepts. Then you have to select three or four best pre-concepts. Use the list of requirements and wishes to select them. Work out the details of these pre-concepts to achieve concepts. Again make a selection to define the best one. Work out this concept even more detailed including materials selection, sizes of the overall geometry and of the most important parts and create a prototype.
Proof that it will be strong enough by calculating stresses in the most critical parts. Make an estimation of the costs. Perform a FMEA to determine the risks and find solutions to lower the most important risks. Describe how you are going to test the quality of the prototype.

Discussion: Here you assess your final design and compare it to the list of requirements and wishes. In case a requirement has not been met, further study is required. In case it is not sure if a requirement has been met, experiments are required. Add a conclusion that states the outcome of your project.

Layout and appearance
A research report should be well presented so that it is inviting for the reader to read. The separate chapters, sections and other parts should be clearly reflected in the titles and headings. Pay attention to the layout of figures and tables (e.g. the space around them, captions, the space they take up in relation to their significance, etc.). There are no strict guidelines for the length of the Internship or Master project report. In general the student is asked to make the report a much to a point as possible (so if you could describe your work in less words, please do so). The assessment of the report will be made on the quality instead of on the quantity, hence a lengthier report will certainly not improve the quality and grade of the work.

General layout: Label all graphs, drawings, diagrams, figures etc. as ‘figures’ and number them consecutively. In the text, refer to tables and figures by their number. The function of tables is the succinct presentation of processed and organized data as pure findings, while graphs should give a quick overview of the nature of the relationships investigated. Because an interpretation is often implicit in the manner of presentation, you need to constantly ask yourself which of the two types is most appropriate for particular findings. Often, graphs are the preferred form. If you opt for tables, make sure that they are small, legible and clear. (Large quantities of data can be included in tables in an appendix.) The caption (located above a table and below a graph) should explain what the table or graph represents, usually without reference to the text. Above the columns of a table and along the axes of a graph, state which variable is plotted and the units in which that variable is expressed. The independent variable is set out along the horizontal axis of a graph and the dependent one along the vertical axis. The scale division along the axes always starts at zero, unless there are important reasons for doing otherwise (logarithmic scale, temperature). The scale division should not be too crude, nor too fine, and should present only round values. If the points on a graph suggest a clear relationship, you can attempt to draw a smooth curve along the dots. Otherwise, straight lines connecting the dots must suffice. Under no circumstances may a curve suggest a greater degree of relationship than the measuring points warrant. Do not mention numbers in the text that are listed in tables, unless for a specific reason, and round numbers in tables and text correctly.

B5.2 PRESENTATION GUIDELINES
During your Internship and Master’s Project you will have to give presentations. You can use the following guidelines when preparing a presentation.

For the Internship you present the results at the research group you worked with. For the master project you need to present at the Winter symposium (poster) and Summer symposium (oral presentation), as well as for the research group (final oral presentation). The final oral presentation is an essential component of the Internship and a Master’s project and counts toward the final assessment. Through the presentation you learn to present your work orally and to discuss it. It allows you to show the kind of work you have done, the origin of the research question, your findings and what you have done with them. It also gives other members of the research group an opportunity to give their input into your research and the processing of your findings. Since you may incorporate comments from the discussion into your report it is advised to do your presentation before completing your report.

General tips: Make sure that you stick to your speaking time and that your presentation goes smoothly, it is advisable to rehearse it several times in advance. Your research group will always make space and an audience available for this purpose.
Be aware of the audience you are addressing – the presence of members of your research group means
that your presentation has to be pitched at an appropriate level. Work out in advance how you intend to use the PowerPoint slides.

**PowerPoint slides and illustrations:** When using slides, be consistent in your layout, typography and - where applicable- use of colour. Specific headings and/or colours should identify the different parts of your argument. Do not put too much information on one slide. Make sure that the letters are large enough; standard font sizes are usually too small! The illustrations (drawings, tables, graphs, diagrams) must be essential; in other words, leave out any that are not strictly necessary. Think hard about which illustrations you should include and what you wish to convey with each figure or table. All figures and tables should have a caption explaining what they are about, but you should also say it once more to your audience. Explain which variables are plotted along the axes of a graph and the units in which they are expressed. Make consistent use of references, abbreviations, etc.

**The presentation:** Almost everyone who speaks in public suffers to some degree from stage fright. One advantage of this is that speakers do not approach their task too lightly. Proper preparation is vital: know what you are going to say. It is important for both the audience and yourself not to lose the thread of your argument. Staying on track can be difficult, particularly if you are not entirely sure of yourself. Outline in brief the key steps of your presentation on the PowerPoint slides. This will help the audience to follow your argument, and will allow you to see at a glance where you have got to. If you are worried about forgetting your text altogether, it may be helpful to write your opening sentences out in full as the start is the most difficult and you can then rest assured that it will go smoothly. Stand where everyone can see and hear you properly. Look at the audience and try to appear relaxed. Pause briefly between the different parts of your argument to accentuate the structure. Analyse the speaking style of people who you consider being interesting speakers – you can learn a lot from them!

There are no strict guidelines for the length of the Internship or Master project presentation. However, for presentations the maximum duration is usually known beforehand (ask your supervisor if unsure). Always leave enough time for questions and discussion. The time remaining is then available for the actual presentation. Please note that during the Winter/Summer symposium the presentations are much shorter when compared to the final presentation.

**In case of a research project the following structure is customary:**

**Title:** This should be short, informative and catchy. Avoid unnecessary frills ('Some contributions to the knowledge of....' etc.). Maybe consider a subtitle. Present the title on the first PowerPoint slide to ensure that your audience knows what your presentation is about.

**Introduction:** Summarize in a few sentences the work of the research group with which you have done your project. Focus gradually on your specific contribution and explain the relevance of your research. Formulate the main research question.

**Material and methods:** Report on the materials (e.g. nature, origin and number of the patients) as well as the experimental set-up and techniques, and methods of analysis used, including the applied statistics. Explain the methods that your audience needs to know in order to follow your argument. Be aware of how familiar or unfamiliar your audience may be with the techniques you have used.

**Results:** The experimental data should be arranged and presented concisely – first all the main points and then interesting details. Drawings, tables and graphs form the basis of this part of your presentation. Be aware that an interpretation is already inherent in the way in which you present and summarize the findings. Be meticulous about your statistical approach to the data. Report the number of measurements, the margins of error and whether certain trends or differences are significant. The effective application of statistical methods can avoid considerable confusion in the discussion.

**Discussion and conclusions:** Here you discuss the conclusions to be drawn from the results, complete with the arguments that you have used. In addition to the direct conclusions arising out of your findings, it is often also possible to formulate interpretations derived from these. When you are presenting interpretations, explain the assumptions that you have made. Test your conclusions against the literature or your own expectations or hypotheses. If certain experiments failed or kept failing during your research, try to outline the reasons for this. Negative results can also be of considerable interest. Finally, show the
extent to which your research question has been answered and what the implications are for your line of research. Avoid the temptation to make risky suggestions or vague assumptions. You could end by making suggestions for further research.

**Summary:** A concise summary of the main conclusions (‘take home message’) from your research is very useful.

**In case of a design project the following structure is customary for your presentation:**

**Title:** This should be short, informative and catchy. Avoid unnecessary frills (‘Some contributions to the knowledge of...’ etc.). Maybe consider a subtitle. Present the title on the first PowerPoint slide to ensure that your audience knows what your presentation is about.

**Introduction:** Summarize in a few sentences the work of the research group with which you have done your project. Focus gradually on your specific contribution and explain the relevance of your project. Give a short overview of current literature on the topic, including some present solutions and their drawbacks.

**Analysis phase:** Present the problems to be handled in a cause-effect diagram and discuss the most important ones. Formulate the goals of the product and describe possible strategies for realising the product that solves the problem and the best one, your design assignment with its deliverables and demarcation in terms of patient group that you focus on. Present the most important requirements and wishes and finally formulate the functions that need to be performed by the product.

In the **synthesis phase** present only the three or four best pre-concepts and the selection you made to define the best one. Give all necessary details of the final prototype including materials selection, sizes of the overall geometry and strength. Give a short estimation of the costs and present the major risks and solutions to lower these risks. Describe how you are going to test the quality of the prototype.

Finally end with a **discussion** in which you assess your final design and compare it to the list of requirements and wishes. Add a conclusion that states the outcome of your project and end your presentation with a take-home message on the last slide.

**B5.3 PLAGIARISM**

Plagiarism is not accepted at this university or elsewhere in the scientific community. In all cases in which plagiarism is found or suspected, the supervisor/examiner will inform the Board of Examiners. When the Board decides that plagiarism has occurred they will sanction in accordance with the "Regulations and Guidelines". In general, this will mean that a student is excluded from participation in examinations or other forms of testing of the concerning module for the current academic year. In case of plagiarism during the Internship/Master thesis phase, the student risks exclusion for the research and will have to re-do the whole project. Plagiarism means using ideas and formulations conceived by others without stating the source. Examples of plagiarism include copying an assignment from a fellow student or senior student, cutting and pasting text from the internet without stating the source of the text, submitting the same assignment more than once, copying an essay from a student at another university or copying part of a book or article. Of course, using source material is allowed, as long as the source is correctly referenced in the text of the report as well as in the reference list.


This checklist for avoiding plagiarism is also from the Little, Brown Handbook:

**Type of source**

Are you using:
- your own independent material,
- common knowledge, or
- someone else’s independent material?
You must always acknowledge someone else’s material in the correct manner.
Quotations
- Do all quotations exactly match their sources? Check them.
- Have you inserted quotation marks around quotations that are stated in your text?
- Have you shown omissions with ellipsis marks and additions with brackets?
- Does every quotation have a source citation?

Paraphrases and summaries
- Have you used your own words and sentence structures for every paraphrase and summary? If not, use quotation marks around the original author’s words.
- Does every paraphrase and summary have a source citation?

The Web
- Have you obtained any necessary permission to use someone else’s material on the Web?

Source citations
- Have you acknowledged every use of someone else’s material in the place where you use it?
- Does your list of works cited include all the sources you have used?

*Please note that all project reports, essays etc. are check with an scanner for the occurrence of plagiarism!*
B6 USEFUL INFORMATION

B6.1 GENERAL 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 educational programmes, form and frequency of examinations, admission regulations, tutoring, cum laude, etc. The General OER can be found at http://www.rug.nl/fwn/education/oer-en/ (choose 2016/2017 basic OER).

B6.2 APPENDIX OER 2016-2017 BIOMEDICAL ENGINEERING

Appendix I. Learning outcomes of the degree programme (art. 1.3)

A graduate with a Master of Science in BME:

General Learning outcomes

1. Reproduce and demonstrate knowledge of anatomy of the musculoskeletal, circulatory, digestive, respiratory, excretory, endocrine and nervous systems and general knowledge of tissues
2. Reproduce and demonstrate knowledge of physiology of the muscular, circulatory, digestive, respiratory, sensory and nervous system
3. Reproduce and demonstrate knowledge of general (patho)physiologic mechanisms (inflammation, infection, immunology, repair)
4. Reproduce and demonstrate knowledge of principles of biochemistry and cell biology
5. Signal analysis, system dynamics and computational mathematics
6. Reproduce and demonstrate knowledge of biotransport in terms of heat transport, mass transport, biofluid mechanics.
7. Demonstrate a systematic approach - characterised by the development and use of theories, models and cohesive interpretations and insight into the specific nature of science, design and technology
8. Argue soundly, evaluate and judge critically on their own work and that of others.
9. Demonstrate proper co-operation with other biomedical engineers and with medical experts.
10. Integrate medical, cultural, social and ethical insights in her/his work.
11. Use current scientific knowledge, assess deficiencies and extend this knowledge by means of life-long learning. Integrate all acquired knowledge and skills to perform a research or design project.
12. Apply design skills, including design methodology, risk analysis, project management, market survey.
13. Show understanding of ethics, including regulatory affairs, and social implications.
14. Apply skills and knowledge within a European industry or hospital. Demonstrate entrepreneurial skills and IP knowledge as part of their professional development.
15. Demonstrate written and oral communication in English within the Biomedical Engineering field.
16. Reproduce and demonstrate knowledge of bio-instrumentation; overview of diagnostic instruments, their possibilities, limitations, physical principles, the phenomena they measure, the relation with the required information.
17. Reproduce and demonstrate knowledge of medical imaging in terms of an overview of present equipment for diagnostics, their possibilities and limitations, their physical principles, the phenomena they measure.
18. Apply knowledge and understanding in designing new/improved diagnostic instruments
19. Apply knowledge and understanding in research involving diagnostic instruments
20 Reproduce and demonstrate knowledge of biomaterials in terms of an overview of potential materials, their properties, applications and limitations, in terms of biocompatibility and failure mechanisms.

21 Reproduce and demonstrate knowledge of biomechanics in terms of statics, mechanics of materials (strength, stiffness, stress, deformation), dynamics (kinematics, kinetics, including gait analysis).

22 Apply knowledge and understanding in designing new or improved therapy devices.

23 Apply knowledge and understanding in research involving therapy devices.

Appendix II. Specialisations of the degree programme
(art. 2.2)

The degree programme is divided into the following specialisations:

a. Diagnostic Imaging and Instrumentation
b. Prostheses & Implant Interface Technology
c. Prostheses & Implant Design
Appendix III. Content of degree programme (art. 2.3)

Course details and mode of assessment and examination are described in Ocasys.

1. Course elements year 1
1a. General course elements

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomaterials 2</td>
<td>5</td>
</tr>
<tr>
<td>Biomedical Instrumentation 2</td>
<td>5</td>
</tr>
<tr>
<td>Control Engineering</td>
<td>5</td>
</tr>
<tr>
<td>Interdisciplinary Project</td>
<td>5</td>
</tr>
<tr>
<td>Mechatronics</td>
<td>5</td>
</tr>
<tr>
<td>Modelling and Simulation</td>
<td>5</td>
</tr>
<tr>
<td>Technology and the Ethics of Research</td>
<td>5</td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td>Internship *</td>
<td>15</td>
</tr>
<tr>
<td>Seminars (4) *</td>
<td>-</td>
</tr>
</tbody>
</table>

* As described in the Guidelines on the Study Portal

1b. CEMACUBE course elements

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Biomedical Knowledge 1</td>
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<tr>
<td>Basic Biomedical Knowledge 2</td>
<td>5</td>
</tr>
<tr>
<td>Biomaterials 2</td>
<td>5</td>
</tr>
<tr>
<td>Biomedical Instrumentation 2</td>
<td>5</td>
</tr>
<tr>
<td>Interdisciplinary Project</td>
<td>5</td>
</tr>
<tr>
<td>Modelling and Simulation</td>
<td>5</td>
</tr>
<tr>
<td>Technology and the Ethics of Research</td>
<td>5</td>
</tr>
<tr>
<td>Electives</td>
<td>10</td>
</tr>
<tr>
<td>Internship *</td>
<td>15</td>
</tr>
<tr>
<td>Seminars (4) *</td>
<td>-</td>
</tr>
</tbody>
</table>

* As described in the Guidelines on the Study Portal
## 2. Course elements year 2

### 2a. Course elements of the specialisation Diagnostic Imaging & Instrumentation

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Processing</td>
<td>5</td>
</tr>
<tr>
<td>Imaging Techniques in Radiology 2</td>
<td>5</td>
</tr>
<tr>
<td>Magnetic Resonance Physics</td>
<td>5</td>
</tr>
<tr>
<td>Medical Physics in Radiation Oncology</td>
<td>5</td>
</tr>
<tr>
<td>Physics in Nuclear Medicine</td>
<td>5</td>
</tr>
<tr>
<td>Master's Project</td>
<td>35</td>
</tr>
<tr>
<td>Seminars (4) *</td>
<td>-</td>
</tr>
</tbody>
</table>

* As described in the Guidelines on the Study Portal

### 2b. Course elements of the specialisation Prosthesis & Implant Interface Technology

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloid and Interface Science</td>
<td>5</td>
</tr>
<tr>
<td>Interface Biology</td>
<td>5</td>
</tr>
<tr>
<td>Integrated Lab Course Biomaterials</td>
<td>5</td>
</tr>
<tr>
<td>Recent Developments in Biomaterials</td>
<td>5</td>
</tr>
<tr>
<td>Surface Characterization</td>
<td>5</td>
</tr>
<tr>
<td>Master's Project</td>
<td>35</td>
</tr>
<tr>
<td>Seminars (4) *</td>
<td>-</td>
</tr>
</tbody>
</table>

* As described in the Guidelines on the Study Portal

### 2c. Course elements of the specialisation Prosthesis & Implant Design

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robotics</td>
<td>5</td>
</tr>
<tr>
<td>Interface Biology</td>
<td>5</td>
</tr>
<tr>
<td>Neuromechanics</td>
<td>5</td>
</tr>
<tr>
<td>Product Design by the Finite Element Method</td>
<td>5</td>
</tr>
<tr>
<td>Prosthetics and Orthotics</td>
<td>5</td>
</tr>
<tr>
<td>Master's Project</td>
<td>35</td>
</tr>
<tr>
<td>Seminars (4) *</td>
<td>-</td>
</tr>
</tbody>
</table>

* As described in the Guidelines on the Study Portal
Appendix IV. Electives (art. 2.4)
Course details and mode of assessment and examination are described in Ocasys.

1. Electives year 1

1a. General Electives

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering &amp; Biotribology</td>
<td>5</td>
</tr>
<tr>
<td>Radiation Physics</td>
<td>5</td>
</tr>
<tr>
<td>Statistical Methods in Physics</td>
<td>5</td>
</tr>
<tr>
<td>Scientific visualization</td>
<td>5</td>
</tr>
</tbody>
</table>

1b. CEMACUBE Electives

<table>
<thead>
<tr>
<th>Course element</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuromechanics</td>
<td>5</td>
</tr>
<tr>
<td>Imaging Techniques in Radiology 1</td>
<td>5</td>
</tr>
<tr>
<td>Statistical Methods in Physics</td>
<td>5</td>
</tr>
<tr>
<td>Scientific visualization</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Courses selected by students

Upon request of the student, the Board of Examiners may approve a course that is not mentioned above. The request procedure must be started at least 6 weeks before the start of the course, and starts when the Board of Examiners receives a new programme proposal, supplemented with argumentation for the request, plus a detailed course description. The argumentation should contain the relevance of the selected course for the student’s individual curriculum.

The Board of Examiners will decide on an individual basis if permission is granted. The student will be informed about the Board’s decision, within 6 weeks by email.
Appendix VI. Admission to the degree programme and different specializations (art. 5.1, 5.2, 5.3)

Admission to the Master’s degree programme
1. Holders of a Bachelor's degree in Life Science & Technology with a major Biomedical Engineering from the University of Groningen, holders of a Bachelor's degree in Physics with the track Life and Health from the University of Groningen, and holders of a Dutch University Bachelor's degree in Biomedical Engineering are considered to have sufficient knowledge and skills and will be directly admitted to the Master's degree programme.

2. Holders of a non-university Bachelor's degree in electrical engineering or mechanical engineering may be admitted individually, under the condition of successfully finishing a premaster programme first. This premaster programme will have a fixed amount of ECTS (15, 30, 45 or 60 ECTS).

3. All other students who apply for the Master's degree programme are individually screened by the BME Admissions Board. Depending on deficiencies, successfully finishing a premaster programme may be necessary before admission to the master programme is granted. This premaster programme will have a fixed amount of ECTS (15, 30, 45 or 60 ECTS). Another option is that any relevant deficiencies have to be neutralized in the first year of the Master's degree programme.

4. CEMACUBE students follow adjusted course elements in year 1 to catch up on the necessary biological background knowledge. In year 2, CEMACUBE students follow one of the regular specialization programmes.

5. International students (these are students with a non-Dutch Bachelor's degree) need to submit their application via the online application system of the University of Groningen to the Admissions Office. The admission deadlines are presented in Appendix VII. All candidates with an international degree are screened by the BME Admissions Board.

Appendix VII. Admission deadlines

Application deadlines for admission (art. 5.6.1)

<table>
<thead>
<tr>
<th></th>
<th>EU/EEA students</th>
<th>non-EU/EEA students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline of application</td>
<td>May 01, 2016</td>
<td>May 01, 2016</td>
</tr>
</tbody>
</table>

Decision deadline Admissions Board (art. 5.6.3)

<table>
<thead>
<tr>
<th></th>
<th>EU/EEA students</th>
<th>non-EU/EEA students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline of decision</td>
<td>June 01, 2016</td>
<td>June 01, 2016</td>
</tr>
</tbody>
</table>
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 the 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 the Student Portal. 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 the Student Portal.

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 the Student Portal.
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

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/usb
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

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
- Kapteynborg (building J, 5419): Astronomy, Landleven 12, 9747 AD Groningen; telephone secretary (050) 3634074 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

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
C. Rules and Regulations

C.3.4 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

Education Support Centre-Ant. Deusinglaan (ESC-ADL)
ESC Desk open: 12.00-14.00 hrs (Mon-Fri)
Building 3214 room 0048
Phone: 050 363 3315 or 3343
Email: esc.fwn@rug.nl