Appendices Master's degree programme Biomedical Engineering 2011-2012

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

The graduate in Biomedical Engineering (BME):

1. has basic knowledge in the general field of BME;
2. is familiar with existing scientific knowledge, skills and attitudes in a specific BME field of expertise and is able to increase and develop these through study;
3. is capable of designing and conducting scientific research and of designing devices or systems in the field of expertise;
4. is capable of effective communication with other experts in the fields of biomedical science and technology and with lay people, both in writing and orally;
5. is capable of cooperating with other experts in international and multidisciplinary teams;
6. is capable to critically analyze and evaluate scientific literature;
7. is capable of systematic and creative working and thinking in analyzing complex problems;
8. is capable to reason soundly, integrate medical, ethical, cultural and social aspects into her/his work and to reflect critically on his/her own and others' work;
9. is prepared for a professional career in science and technology or in management and policy;
10. is capable of following a post-graduate training in BME, performing a PhD project and training him/herself continuously

Appendix B Specializations of the degree programme (art. 2.2)

The degree programme is divided into the following specializations:
a) specialization: Function Restoration for Healthy Aging
b) specialization: Clinical Physics

c) Within the degree programme qualified students can follow the Erasmus Mundus programme Common European MAster's CoUrse in Biomedical Engineering (CEMACUBE), an intensified programme which prepares for conducting top quality research in biomedical engineering. For this programme the Erasmus Mundus Teaching and Examination Regulations apply.

Appendix C Content of degree programme (art. 2.3)

a. Function Restoration for Healthy Aging

Master's Curriculum	ECTS	Mode of examination
Biomaterials 2	5	W
Imaging Techniques in Radiology	5	RPW
Biomedical Instrumentation	5	RW
Numerical Methods	5	RW
Technology and Ethics	3	E
Multidisciplinary Project	5	RP
Neuromechanics	5	W
Quality of Life	2	R
Introduction Research Assignment	5	RP
Colloids and Interface Science	5	W
Recent Developments in Biomaterials	5	RP
Optional Modules	25	
Research Assignment	30	RP
Internship	15	RP

b. Clinical Physics

Master's Curriculum	ECTS	Mode of examination
Material Science	5	W
Imaging Techniques in Radiology	5	RPW
Biomedical Instrumentation	5	RW
Numerical Methods	5	RW
Technology and Ethics	3	E
Multidisciplinary Project	5	RP
Neuromechanics	5	W
Quality of Life	2	R
Introduction Research Assignment	5	RP
Electronics	5	RPW
Radiation Physics	5	W
Principles of Measurement Systems	5	W
Optional Modules	20	

Research Assignment	30	RP
Internship	15	RP

Mode of examination:
(W) Written or Oral Examination
(R) Practical or Report
(P) Presentation
(E) Essay

Appendix D Optional modules (art. 2.4)

a. Function Restoration for Healthy Aging

Master's Curriculum	ECTS	Mode of examination
Product Design & Finite Element Method	5	R
Stem Cells & Regenerative Medicine	5	RP
Solid Mechanics	5	RW
Physics of Transport Phenomena 2	5	W
Mechatronics	5	W
Philosophy of Natural Sciences	5	W
Reasoning and Arguing	5	W
Integrated Lab Course Biomaterials	5	RP
Surface Characterization	5	RPW
Interface Biology	5	RPW
Robotics	5	W
Molecular Biophysics	5	W
Control Engineering	5	RW
Nanophysics and Nanotechnology	5	W
Transport in Biological Systems	5	W

b. Clinical Physics

Master's Curriculum	ECTS	Mode of examination
Optical Measurements in Medicine	5	RP
Radiation Safety	3	RW
MR Physics	5	W
Advanced Imaging Techniques	5	
Applied Signal Processing	5	RW
Scientific Visualization	5	R
Computer Vision	5	RW
Mechatronics	5	W
Philosophy of Natural Sciences	5	W
Reasoning and Arguing	5	W
Medical Physics in Radiation Oncology	5	RW
Nuclear Medicine, SPECT and PET	5	W
Robotics	5	W

Control Engineering	5	RW
Transport in Biological Systems	5	W
Basic Biomedical Knowledge for Engineers 1	5	RPW
Basic Biomedical Knowledge for Engineers 2	5	RPW
Recent Advances in Clinical Medicine	5	RP

Appendix E Entry requirements and compulsory order of examinations (art. 3.2)

Module	After successfully passing exams modules
Integrated Lab Course Biomaterials	Colloid and Interface Science Interface Biology Surface Characterization
Principles of Measurement Systems	Electronics
Medical Physics for Radiation Oncology	Radiation Physics
MR Physics	Principles of Measurement Systems
Nuclear Medicine, SPECT and PET	Principles of Measurement Systems Radiation Physics
Biomaterials 2	Biomaterials 1

Appendix F Admission to the degree programme and different specializations (art. 4.1.1 + art. 4.2)

1. Holders of a Bachelor's degree in either Life Science & Technology, major Biomedical Engineering, Physics or Applied Physics, from the University of Groningen are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme.

2. Admission requirements for the two specializations:
   - specialization Function Restoration for Healthy Aging: Colloids and Interface Science as elective in the first year
   - specialization Clinical Physics: Electronics as elective in the first year

Appendix G Application deadlines for admission (art. 4.5.1)

Deadline of Application	Non-EU students	EU students
Biomedical Engineering	April 15th 2012	June 1st 2012

Decision deadlines (art. 4.5.3)

Deadline of Decision	Non-EU students	EU students
Biomedical Engineering	June 15th 2012	July 1st 2012