**Study program 2009 – 2010** (starting September 14, 2009)

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<th>First year: 60 ECTS</th>
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<td>Students with a medical or biological background:</td>
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<td>- Electronics and data acquisition</td>
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<td>- Introduction to biophysics and chemistry</td>
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<td>Students with a background in physics, chemistry or engineering:</td>
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<tr>
<td>- Introduction to immunology and genetics</td>
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<td>- Fundamentals of bioelectronics</td>
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<td>- Seminar course on biomaterials</td>
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<td><strong>Week 9 - 16</strong></td>
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<td>- Biochemistry of surfaces</td>
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<td>- Nano- and microsystems technology</td>
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<td><strong>Week 35 – 38</strong></td>
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<td>- Electrical diagnosis techniques and active implants</td>
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<td>- Nanobiochemistry</td>
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<th>Second year: 60 ECTS</th>
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<td>- Functional molecule modeling</td>
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General aims of the master program in biomedical sciences

1. The master possesses in depth knowledge of the chosen study direction in the biomedical sciences.
2. The master can communicate about the current literature in the field of biomedical sciences. The master can also critically judge the contents of this literature and can formulate new hypotheses based on this literature.
3. The master is capable of operating advanced equipment relevant for the biomedical sciences. The master also is capable of performing the most recent analytical and preparative techniques.
4. The master has sufficient knowledge and skills to initiate and execute independent scientific research in the biomedical sciences. This means that the master possesses the following independent skills: i) to develop a scientific strategy and verify a hypothesis; ii) to research the behavior of relevant living systems under new conditions; iii) to develop, implement and optimize new preparation techniques; iv) to apply research techniques from other disciplines in an adequate manner; v) within the own research area to analyze problems independently and to formulate possible solutions; vi) to critically evaluate research results and describe them in a written scientific report.
5. The master can transfer knowledge of the studied subject area to scientists from other relevant disciplines.
6. The master is capable to integrate various interdisciplinary viewpoints during the analysis of biomedical questions.
7. The master is capable of placing the acquired knowledge and insights into an ethical and societal perspective.
8. The master has acquired sufficient knowledge and competencies to write a research proposal ultimately leading to a Ph.D.
9. The master is capable of reporting scientific results in a structured manner, both orally and written in English or Dutch.
10. The master is familiar with relevant national and international scientific networks.

Additional specific aims of the master in bioelectronics and nanotechnology

1. The master is capable of utilizing (possibly modified) biological materials (for example, tissue, microorganisms, organelles, membrane receptors, enzymes, antibodies, nucleic acids, etc.) in electronic biosensors.
2. The master can indicate which specific materials can be used for typical bioelectronic systems, and can reason this selection.
3. The master can explain the physicochemical characteristics of relevant materials.
4. The master can identify the biochemical characteristics of bioelectronic components.
5. The master can use multidisciplinary information streams to identify new approaches in the field of bioelectronics and the corresponding nanotechnology.
6. The master is capable of providing a broad overview of the handling and usage of the most important materials in bioelectronics.
7. The master can work in a multidisciplinary research team en understands the scientific language of the various relevant subdisciplines.
1829 Literature study and seminar course on biomaterials

Contact person: Prof. dr. Thomas CLEIJ
Coordinator: Prof. dr. Thomas CLEIJ
Co-titularis: Prof. dr. Patrick WAGNER
Other members of teaching team: dr. Erik STEEN REDEKER

Year 1 master BMW-BEN, period 1
4.00 ECTS credits

Performance objectives

- Knowledge of the newest developments in biomaterials science.
- Being able to study, analyze and summarize scientific literature.
- Being able to present the contents of scientific articles in a group.
- The presentation of scientific information in the form of a seminar.
- The development of a critical attitude towards scientific information.
- Knowledge of the interactions between the various scientific disciplines in the domain of biomaterials science.

Teaching methods
Assisted self-study of scientific articles, lectures, student seminars, group discussions.

Keywords
Bioelectronics, literature research, biomaterials, material science, seminar course.

Prerequisites
None

Aims
The student is capable of doing an independent study and interpretation of scientific literature and can present the information in the form of a seminar.
General aims of the master program in biomedical sciences: 1, 2, 4, 5, 6, 7, 9
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 5, 6, 7

Compulsory books to buy

Recommended Reading

Assessment
Student seminar (contents and presentation), summaries of articles and oral examination.
Academic Year 2009-2010

1832 Introduction to biophysics and chemistry

Contact persoon: Prof. dr. Patrick WAGNER
Coördinator: Prof. dr. Patrick WAGNER
Co-titularis: Prof. dr. Thomas CLEIJ
(Other members of teaching team: Prof. dr. Robert CARLEER)

Year 1 master BMW-BEN, period 1
4.00 ECTS credits

Performance objectives

• Physical and chemical foundations at the basis of life-science research.
• Chemical bonds, molecular structures, ordered and disordered solids.
• Transport of molecules and electric current in liquids, gasses, and solids.
• Working principles of physical sensors and chemosensors.
• Introduction to infrared spectroscopy and optical spectroscopy.

Teaching methods
Lectures and self-study assignments, accompanied by practical assignments like i) Electrical conduction in electrolytes, ii) Infrared spectroscopy on gasses, liquids, and proteins, iii) Electrical models of the cell membrane, iv) Biomimetic solar cell and yeast-based fuel cell, v) Molecular imprinting.

Keywords
Physical transport processes, optics, polymer chemistry, nanoparticles, chemical reactions.

Prerequisites
The student has obtained an academic Bachelor degree in agreement with the admission conditions for the specialization in Bioelectronics and Nanotechnology. The course aims at students, who have followed the Major project ‘Bioelectronics’ (3rd year of the Bachelors programme Biomedical Sciences at Hasselt University) – or have a similar prior education.

Aims
The student is familiar with selected, interdisciplinary topics of biochemistry and biophysics. The student can apply these concepts in a bioelectronic context.

General aims of the master program in biomedical sciences: 1, 2, 3
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 6

Recommended reading

Assessment
Oral examination. Admission to the examination requires that the practical assignments were successfully performed.
1833 Fundamentals of bioelectronics

Contact persoon: Prof. dr. Patrick WAGNER
Coördinator: Prof. dr. Patrick WAGNER
Co-titularis: Prof. dr. Thomas CLEIJ
(Other members of teaching team: Prof. dr. Robert CARLEER)

Year 1 master BMW-BEN, period 1
4.00 ECTS credits

Performance objectives

• Chemical bonds and reaction mechanisms, structure of organic molecules.
• Diffusive transport of molecules in gasses and liquids.
• Working principles of physical sensors and chemosensors.
• Introduction to infrared spectroscopy and optical spectroscopy.
• Membrane potential and intercellular signal transduction.

Teaching methods

Lectures and self-study assignments, accompanied by practical assignments like i) Electrical conduction in electrolytes, ii) Infrared spectroscopy on gasses, liquids, and proteins, iii) Electrical models of the cell membrane, iv) Biomimetic solar cell and yeast-based fuel cell, v) Molecular imprinting.

Keywords

Physical transport processes, optics, polymer chemistry, nanoparticles, chemical reactions.

Prerequisites

The student has obtained an academic Bachelor degree in agreement with the admission conditions for the specialization in Bioelectronics and Nanotechnology. The course aims at students, who have followed the Major project ‘Bioelectronics’ (3rd year of the Bachelors programme Biomedical Sciences at Hasselt University) – or have a similar prior education.

Aims

The student is familiar with selected, interdisciplinary topics of biochemistry and biophysics. The student can apply these concepts in a bioelectronic context.

General aims of the master program in biomedical sciences: 1, 2, 3
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 6

Recommended reading

Lecture notes on ‘Biophysics and Biochemistry’ and selected scientific publications.

Assessment

Oral examination. Admission to the examination requires that the practical assignments were successfully performed.
Academic Year 2009-2010

1830 Electronics and data acquisition

Contact person: Prof. dr. Ken HAENEN
Coordinator: Prof. dr. Ken HAENEN

Year 1 master BMW-BEN, period 1
4.00 ECTS credits

Performance objectives

- The student is familiar with fundamental concepts and principles of electronics, like the role of sensors and actuators, amplification, and control and feedback.
- The student is familiar with basic electronic circuits based on operational amplifiers and knows their characteristics.
- The student is familiar with the concept ‘semiconductor’ and how they are applied in diodes.
- The student is familiar with the concept, working principle and characteristics of different field effect transistors and bipolar transistors.
- The student is familiar with the basic building blocks of digital circuits.
- The student can perform practical experiments and is able to read an electronic scheme, transfer this to an electronic board and solder the necessary components to fabricate a sensor.

Teaching methods
Lectures, practical experiments, sensor fabrication by solder assignment.

Keywords
Electronic systems, feedback, operational amplifiers, diodes, transistors, digital systems.

Prerequisites
Basic concepts of electricity

Aims
General aims of the master program in biomedical sciences: 1, 3, 4, 7
General aims of the master in bioelectronics and nanotechnology: 2, 3, 4, 5, 6

Recommended reading
Lecture notes, practical experiments notes.

Compulsory books
ISBN: 978-0-13-129396-0

Assessment
Evaluation of experimental assignments, including the sensor fabrication, the capability to solve simple problems related to the theory, and oral examination.
1831 Immunology and Genetics

Contact persoon: Prof. dr. Luc MICHIELS
Coordinator: Prof. dr. Luc MICHIELS

Year 1 master BMW-BEN, period 1
4.00 ECTS credits

Performance objectives

- The student knows the molecular structure of biomolecules.
- Understanding of the organization of the prokaryote, viral, and eukaryote genome.
- The student is familiar with the molecular processes of DNA replication, gene expression, and the control mechanisms of gene expression.
- The student has a basic knowledge of molecular genetic techniques in genomics, transcriptomics, and proteomics.
- The student is familiar with the mechanisms of the adaptive and innate immune systems.
- The student can describe the main molecular interactions between antigens, T-cell receptors and immunoglobulins.

Teaching methods
Lectures, group discussions, self-study assignments

Keywords
Nucleic acids, proteins, transcription, translation, gen regulation, immunoglobulins, T-cell receptor, lymphocytes.

Prerequisites
Basic elements of chemistry and cell biology

Aims
The student is familiar with the working principles of the genome and the immune system.
General aims of the master program in biomedical sciences: 3
General aims of the master in bioelectronics and nanotechnology: 1, 4, 7, 8.

Recommended reading
Lecture handouts will be available on BlackBoard, specific book chapters.

Assessment
Written examination
1977 Biosensors

Contact person: Prof. dr. Patrick WAGNER
Coordinator: Prof. dr. Patrick WAGNER
Co-titularis: Prof. dr. Thomas CLEIJ

Year 1 master BMW-BEN, period 2
4.00 ECTS credits

Performance objectives
- Knowledge on the most important state-of-the-art sensoric techniques for the detection of biomolecules, metabolites, and organic/inorganic contaminants.
- Awareness of the possibilities and current limitations of biosensors in the diagnosis of hereditary diseases, metabolic diseases, early diagnosis of cardiovascular damage, cancer, infections, and environmental pollution.
- Overview on working principles, assay formats, and technical layout of biosensor concepts, ranging from ion-sensitive electrodes to single-molecule spectroscopy.

Teaching methods
Lectures and self-study assignments, complemented by demonstrations in research laboratories and two practical experiments, which can be chosen from e.g. i) potassium electrode, ii) glucose electrode, iii) cyclic voltammetry and iv) antennogram detector.

Keywords
Bio- and biomimetic sensors, biochemical receptors, microbalances, surface plasmon resonance, impedance spectroscopy, field-effect transistors, labelling, total analysis system.

Prerequisites
The student has a bachelor diploma in agreement with the admission conditions for the Masters programme on Bioelectronics and Nanotechnology.

Aims
The student is familiar with various types of biosensors, allowing him to select and to design suitable sensors for specific bioanalytical tasks depending on the target molecules, sample matrix, and expected concentration range.
General aims of the master program in biomedical sciences: 1, 2, 3.
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 6.

Recommended reading
Handouts of the lecture notes are made available via BlackBoard.

Assessment
Oral examination. Admission to the examination requires that the practical assignments were successfully performed.
Academic Year 2009-2010

2017 Chemistry of surfaces

Contact Person: Prof. dr. Thomas CLEIJ
Coordinator: Prof. dr. Thomas CLEIJ
Co-titularis: Prof. dr. Patrick WAGNER
(Other members of teaching team: Prof. dr. Wim HERMENS from Maastricht University)

Year 1 master BMW-BEN, period 2
4.00 ECTS credits

Performance objectives

• Knowledge of the physical and biochemical properties of surfaces.
• An understanding of the biological activation of surfaces using covalent and non-covalent methods.
• An introduction to the experimental techniques, which can be used to modify surfaces and the ability to select a suitable technique for a specific bioelectronic application.
• Introduction to the physical and analytical techniques to study processes at surfaces.
• Knowledge of micro contact printing.

Teaching methods
Lectures, self-study assignments

Keywords
Properties of surfaces, biological activation, Langmuir-Blodgett films, self-assembly, chemical coupling methods, plasma treatment, electrochemical techniques, photochemistry, nanoparticles, FT-IR spectroscopy, micro contact printing.

Prerequisites
Basic knowledge of organic chemistry

Aims
The student is capable of selecting relevant surface modification methods for a specific application in the context of bio-functionalization. In addition, the student is aware of relevant surface analysis techniques.
General aims of the master program in biomedical sciences: 1, 2, 3, 5, 6
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 4, 5, 6, 7

Compulsory books to buy
"Biomaterials: The Intersection of Biology and Materials Science";

Other Study materials
Scientific articles for the self-study assignments (BlackBoard)

Assessment
Oral examination
1986 Nano- and Microsystems Technology

Contact person: Prof. dr. Hans-Gerd BOYEN
Coordinator: Prof. dr. Hans-Gerhard BOYEN
Co-titularis: Prof. dr. Patrick WAGNER

Year 1 master BMW-BEN, period 2
4.00 ECTS credits

Performance objectives
This course aims to provide an overview over micro- and nanotechnology with special emphasis on information storage and processing systems, materials science, design, and manufacturing issues of these systems and their components.

- Fabrication of micro- and nanostructures by top-down lithographic techniques.
- Bottom-up strategies based on the self-assembly of atomic/molecular building blocks and their impact on existing technologies.
- Functional properties of nanomaterials including basic steps of a quantum-mechanical description.
- Characterization tools for the nanoworld (AFM, STM, XPS, etc.)
- Selected materials/systems with nanomechanical and nanoelectrical properties.
- Manipulation of nanosystems.

Teaching methods
Lectures, self-study assignments, demonstrations and practicals in research laboratories.

Keywords
Optical and e-beam lithography, patterning techniques, nanoscaled (bio-)sensors, micelles, fullerenes, scanning probe microscopy, microfluidics, MEMs, NEMs, optical tweezers.

Prerequisites
Basis knowledge of materials science.

Aims
General aims of the master program in biomedical sciences: 1, 3, 8.
General aims of the master in bioelectronics and nanotechnology: 2, 3, 5, 7.

Recommended reading
Handouts of the lecture notes and selected scientific publications will be provided.

Assessment
Oral examination
Academic Year 2009-2010

1837 Junior Practical Training

Contact person: Prof. dr. Patrick WAGNER
Coordinator: Prof. dr. Patrick WAGNER
Co-titularis: Prof. dr. Thomas CLEIJ
(Other members of the team: dr. Erik STEEN REDEKER, Prof. dr. Luc MICHIELS, Prof. dr. Hans-Gerd BOYEN, Prof. dr. Marlies VAN BAEL, Prof. dr. Jean MANCA)

Year 1 master BMW-BEN
21.00 ECTS credits

Performance objectives
- The student is familiar with interdisciplinary research in the following domains: Synthesis of biocompatible and biofunctional materials.
- Preparation, characterization, and handling of biomolecules.
- Study of cells with optical and electronic methods.
- Development of miniaturized sensors and nanoscale materials analysis.

Teaching method
Project practicum (three mini projects of 4 weeks each) in the laboratories of three different research groups: i) Chemistry, ii) Biomedicine, and iii) Materials physics.

Prerequisites
The student has successfully passed all examinations of the first three teaching periods of Year 1 – master BMW-BEN.

Aims
The student has acquired hands-on experience with state-of-the-art instrumentation used in biomolecular-, nanotechnological-, and bioelectronic research. The student is especially aware of the interdisciplinary facets of current life-science research.
General aims of the master program in biomedical sciences: 1, 2, 3
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 6

Recommended reading
Specific articles from scientific journals, together with recent master theses and doctoral theses in the respective research fields.

Assessment
Each of the three modules will be evaluated on basis of the practical work in the research laboratory, the written report, and an oral presentation.
1474 Electronic diagnostic techniques and active implants

Contact person: dr. Willem DASSEN  
Coordinator: dr. Willem DASSEN

Year 1 master BMW-BEN, period 4  
3.00 ETCS credits

Performance objectives
- The student acquires a detailed insight in several, frequently occurring diseases, insufficiencies, and physical handicaps, which can be diagnosed and / or relieved by electric or electronic approaches.
- The student understands that the development of electric / electronic therapeutic methods asks for an interdisciplinary cooperation of several scientific domains.
- The course aims at enabling the students to deliver own, innovative contributions to the development of complex medical instrumentation, keeping in mind the patients quality of life as the major priority.
- Theses issues will be addressed in depth for the electric stimulation of the hart by pacemakers and defibrillators, keeping in mind also the tissue-implant interaction from an immunologic and materials-science point of views.

Teaching methods
Lectures; self-study assignments, visit to Medtronic (Bakken Research Center – Maastricht) and other companies active in the field of medical instrumentation.

Keywords
Pacemakers, telemetry, implants, Holter apparatus, legislation on medical instruments.

Prerequisites
'Electronics and data acquisition’ or equivalent prior education.

Aims
The student knows the possibilities (and current limitations) of instruments and techniques to analyse, to support, and to substitute physiological functions. This is a rapidly evolving domain and the student is aware of the most recent, forthcoming, and future developments. The student can judge the impact of these evolutions on health and quality of life of the patients in a realistic way.
General aims of the master program in biomedical sciences: 1, 4, 5, 6.
General aims of the master in bioelectronics and nanotechnology: 3, 4, 6, 7.

Recommended reading
Literature on 'Electronic diagnostic techniques' and technical documentation on specific prostheses, implants, and diagnostic instruments will be provided.

Assessment
Evaluation of experimental assignment and presentation.
2003 Nano(bio)chemistry

Contact Person: Prof. dr. Thomas CLEIJ
Coordinator: Prof. dr. Thomas CLEIJ
Co-titularis: Prof. dr. Marlies VAN BAEL
Other members of teaching team: dr. Erik STEEN REDEKER

Year 1 master BMW-BEN, period 4
3.00 ECTS credits

Performance objectives
- An introduction to a number of recent developments in nanochemistry.
- Understanding of (bio) materials science on the nanoscale.
- Understanding of the various types of nanomaterials and their classification.
- Knowledge of the synthesis of nanomaterials.
- Knowledge of the physical properties and analysis of nanomaterials.
- Knowledge of the applications of biomaterials in bio-electronics.

Teaching methods
Lectures, group discussions, presentations, self-study assignments, study groups

Keywords
Nanochemistry, biochemistry, nanobiochemistry, self-assembly, nanoparticles and nanoclusters, biomaterials, block copolymers.

Prerequisites
Passing grade in 2017: Chemistry of surfaces

Aims
The student is familiar with the most important developments and concepts in the field of nanochemistry and can apply these in the context of bioelectronics and nanotechnology.
General aims of the master program in biomedical sciences: 1, 2, 4, 5, 6
General aims of the master in bioelectronics and nanotechnology: 1, 2, 3, 5, 6, 7

Recommended Reading

Assessment
Oral examination and individual assignments
1982 Scientific writing and planning of master project

Contact Person: Prof. dr. Luc MICHIELS
Coordinator: Prof. dr. Luc MICHIELS

Year 2 master BMW-BEN, period 1
3.00 ECTS credits

Performance objectives
- To make the students familiar with the start of scientific research and the writing of a scientific research proposal.
- The central theme is a practical exercise using specific assignments of a scientific process consisting of hypothesis, problem statement, experiment, results, interpretation and conclusion.
- The application of the above concepts in the context of the senior research project in preparation of the senior practical training (2001) and master thesis (2002).

Teaching methods
Lectures, self-study assignments

Prerequisites
Major from the bachelor biomedical sciences (1269) or equivalent, junior practical training (1843).

Aims
General aims of the master in bioelectronics and nanotechnology: 5, 6, 7
The student understands the scientific process: hypothesis, problem statement, experiment, results, interpretation and conclusion.
The student is capable of formulating a scientific hypothesis and to prepare a workable research project based on the concept of the scientific process.
The student is able to formulate expected outcomes.
The student is capable to plan and execute independent research.

Other study materials
Lectures and specific literature will be available on BlackBoard.

Assessment
Written research project with SWOT analysis.
Performance objectives
- The course provides a detailed introduction into the principles and methods of statistical physics with special emphasis on small-scale systems and bio-functional entities.
- The techniques and concepts for the description of soft matter will be illustrated with case studies from molecular biology and nanotechnology.

Teaching methods
Lectures, self-study assignments, and tutored exercises.

Key words
Soft matter, proteins, Brownian motion, force, mechanical, chemical, and statistical properties.

Prerequisites
No special requirements.

Aims
The student understands several, fundamental principles of physics, especially in their application to soft matter and related topics. He can make estimates on physical observables in theoretical problems and practical experimental situations.

Recommended reading

Assessment
Written examination and evaluation of exercises.
Academic Year 2009-2010

**1980 Bio-analytical methods of molecules**

Contact Person: Prof. dr. Marc D’OLIESLAGER  
Coordinator: Prof. dr. Marc D’OLIESLAGER  
Co-titularis: Prof. dr. Sabine VAN DOORSLAER

Year 2 master BMW-BEN, period 1  
3.00 ECTS credits

**Performance objectives**

- The student acquires knowledge on a number of surface sensitive analysis techniques.
- The student acquires knowledge on the basic principles of X-ray diffraction.
- The student understands the characterization of crystals and biomolecules using various diffraction techniques (x-ray, electrons).
- The student knows the possibilities and limitations of diffraction techniques.
- The student obtains knowledge of the basic principles of magnetic resonance.
- The student has an understanding of the characterization of biomolecules using various magnetic resonance techniques.
- The students knows the possibilities and limitations of various magnetic resonance techniques.

**Teaching methods**

Lectures, study groups, laboratory work, demonstrations, practical training in X-ray diffraction experiments.

**Keywords**

Surface analysis, diffraction techniques, magnetic resonance

**Prerequisites**

Subjects from biophysics and biochemistry (1832)  
Nano- and microsystem technology (1986)

**Aims**

General aims of the master in bioelectronics and nanotechnology: 3, 4, 5, 6

**Assessment**

Oral examination with written preparation
1981 Functional molecule modeling

Contact Person: Prof. dr. Michael DELEUZE
Coordinator: Prof. dr. Michael DELEUZE
Co-titularis: Prof. dr. Bart CLEUREN

Year 2 master BMW-BEN, period 2
3.00 ECTS credits

Performance objectives

- A descriptive introduction to essential approaches, models and theories to perform molecular simulations in the gas phase and in the condensed phases (solutions, solids).
- The prediction of molecular properties (molecular and electronic structures, electron densities and potential energy surfaces, electrical multipoles of responses, spectroscopic and thermodynamic properties, chemical binding, conformational analysis, protein structures and sequences, …).
- The use of molecular mechanics and dynamics, statistical thermodynamics and Monte Carlo methods as well as quantum mechanics (Hückel theory, Hartree-Fock theory, density functional theory, band structure theory).

Teaching methods
Lectures, self-study assignments

Prerequisites
Knowledge of (1) mathematical concepts and techniques (vectors, matrices, complex numbers, derivatives and integrals, linear algebra), (2) postulates from classical mechanics involving energy, mass, velocity, force and impulse, interactions between charges as well as (3) general thermodynamics (internal energy, enthalpy, entropy, Gibbs free energy).

Aims
To provide an introduction to basic computer methods, which are important for modeling or drug design.

Recommended reading

Assessment
Written examination with oral discussion
2002 Thesis research

Contact Person: Prof. dr. Patrick WAGNER
Coordinator: Prof. dr. Patrick WAGNER
Co-titularis: dr. Willem DASSEN

Year 2 master BMW-BEN
24.00 ECTS credits

Performance objectives

During the thesis research project, the student will perform independent research in a research laboratory under the supervision of a scientific adviser. The available research laboratories are situated at Hasselt University, Maastricht University, and at various external laboratories in companies, hospitals, and research groups, both within Belgium and abroad. The various research opportunities will be presented on BlackBoard and will be further explained by the thesis research coordinator as well as various advisers at an information meeting. The thesis research will have a duration of 30 weeks, full time and the results will be compiled in the master thesis (2001).

Teaching methods
Individual thesis research, scientific research

Prerequisites
Successful completion of the first year of the master program.

Aims
General aims of the master program in biomedical sciences: 1, 2, 3, 4, 5, 7, 9
General aims of the master in bioelectronics and nanotechnology: 2, 5, 7

Assessment
The assessment of the thesis research is done by the adviser using a set of predefined criteria (independence, motivation, initiative, collaboration in the group, …).
Performance objectives

The results of the independent scientific thesis research (2002) will be compiled into the master thesis. This master thesis consists of at least a summary, an introduction, materials and methods, results and a critical discussion of the obtained results. Appropriate reference will be made to the international literature in the subject domain. The results of the research will be presented and defended before a jury.

Teaching methods
Writing and defense of the master thesis

Prerequisites
Successful completion of the first year of the master program.

Aims
General aims of the master program in biomedical sciences: 1, 2, 3, 4, 5, 7, 9
General aims of the master in bioelectronics and nanotechnology: 5, 7

Assessment
The assessment of the master thesis is done by the adviser and a second evaluator using a set of predefined criteria (content, form, argumentation, scientific achievement). In addition, a score will be given by the jury based on the presentation and defense of the master thesis.