

## **Appendices Master's degree programme Nanoscience 2011-2012**

### *General stipulations*

Article 1.5 reads: The Programme is taught in English.

The articles 2.2, 4.1, 4.2 and 4.3 are void.

Article 4.4 is renumbered 4.1.

Article 4.5 is renumbered 4.2.

Article 4.6 is void.

A new article 4.3 is inserted describing the special admissions procedure for the Top Master Programme in Nanoscience. See Appendix E below.

In the Model Teaching and Examination Regulations Master's degree 2010-2011, for Appendix C, read Appendix B; for Appendix D, read Appendix C; for Appendix E, read Appendix D.

### *Appendix A. Objectives of the Programme*

The Top Master Programme in Nanoscience aims to provide the student with the knowledge, skills, and insights pertaining to the field of nanoscience that will enable him or her to seek employment or apply for a continued training as researcher.

### *Appendix B. Content of the degree programme*

The compulsory part of the Top Master Programme in Nanoscience consists of:

a. **Guided self-study** (6 ECTS) intended to enable students to follow the Core Curriculum. Topics from the following list will be assigned on an individual basis by the Chair of the Board of Examiners:

- Solid-state physics
- Quantum theory
- Organic chemistry
- Inorganic chemistry
- Mathematics

For each assigned topic, the tutor associated with the topic will determine in an oral exam whether the student has passed the requirements.

### **b. Core Curriculum** (30 ECTS)

The Core Curriculum defines to a large extent the character of the Programme. It consist of the following three modules:

Preparation of nanomaterials and devices (8 ECTS)

Characterization of nanomaterials (9 ECTS)

Fundamental and functional properties of nanomaterials (13 ECTS)

These modules will be examined in written form in two or three parts each. The mark obtained for each part has to be at least 6.

### **c. Scientific paper** (6 ECTS)

The student will write a scientific paper on a topic of his or her choice. This choice needs the approval of the mentor and of the coordinator of this component of the programme,

who will also jointly determine the mark obtained.

**d. Small research project (13 ECTS)**

The student will carry out a small research project around an already defined problem. All students of a given cohort will jointly organize a symposium in which they will present their individual small research projects. The supervisor of the project and the coordinator of this component of the curriculum will jointly determine the mark obtained.

**e. MSc thesis project (45 ECTS)**

The student will carry out a substantial research project.

**f. PhD proposal (6 ECTS)**

The student will write a proposal for a PhD project, in the form required by Dutch funding agencies like FOM. It is not necessary that the student actually intends to carry out this project himself or herself. The supervisor of the project and the coordinator of this component of the curriculum will jointly determine the mark obtained.

The small research project (sub d) and the MSc thesis project (sub e) cannot be carried out in the same research group.

The small research project (sub d), the MSc thesis project (sub e), and the scientific paper (sub c) cannot be on the same topic nor supervised by the same person.

*Appendix C. Optional modules*

The student will spend at least 14 ECTS on electives, on topics related to nanoscience but not sufficiently covered by the Core Curriculum. The choice of electives requires consultation with the mentor and approval by the Board of Examiners. These electives are taken from the regular physics and chemistry curricula (see the Teaching and Examination Regulations of those master's degree programmes).

The electives in the list below are recommended.

Course name	Code	Credits(ECTS)
Reaction mechanisms	NS102	4
Structure determination using spectroscopic methods	NS104	4
Computational physics	NS106	4
Non-linear optics	NS108	4
Many-particle systems and quantum theory of solids	NS110	4
Theoretical condensed-matter physics	NS112	4
Mesosopic physics	NS114	4
Micromechanics	NS116	4
Computational methods of quantum chemistry	NS120	4
Stereochemistry	NS124	4
Coordination chemistry	NS128	4
Polymer surfaces and interfaces	NS132	4
Polymer physics	NS134	4
Advanced polymer chemistry	NS136	4
Physics of lasers	NS138	4
Solid-state phase transitions	NS140	4
Device physics	NS142	2
Modern laser microscopy	NS146	4
Surface analysis techniques (Part of: Surfaces and Interfaces)	NS196	3

Please note that the ECTS points assigned to these courses as electives for the Top

Master Programme in Nanoscience are lower than the ECTS points assigned to these same courses when part of a regular master programme.

It is also possible to choose modules not included in this list as electives, subject to approval by the Board of Examiners. In such case, the Board of Examiners will determine the study load in ECTS associated with each elective not from the list above.

*Appendix D. Entry requirements and the compulsory order of examination*

The Guided Self-study has to be completed prior to the start of the Core Curriculum.

The Core Curriculum has to be completed prior to the start of the electives.

The small research project and the scientific paper have to be completed prior to the start of the MSc thesis project.

*Appendix E. Admission procedure*

1. Students in possession of an admission permit can be admitted to the programme.
2. Students who meet the requirements are provided with an admission permit by the Admission Board.
3. An admission permit is only valid for the academic year following the academic year in which the permit is granted.
4. There may be other conditions attached to the admission permit. The requirements must be met before the programme has started.
5. The admission requirements comprise:  
a bachelor's degree in chemistry, physics, materials science, or other field deemed relevant by the Admissions Board;
  - a. sufficient knowledge of the English language;
  - b. sufficient knowledge of the relevant sciences;
  - c. a suitable attitude, motivation and talent to follow the programme.
6. The Board of Examiners establishes an Admissions Board that judges the student's fulfilment of the requirements. This Board consists of three members of the Board of Examiners, completed by a university employee. One of the members is appointed as chairperson.
7. The decisions of the Admissions Board can be appealed to at the Board of Appeal for Examinations.
8. Students apply to the admission procedure by sending in the following documents:
  - a. a completed application form;
  - b. a complete curriculum vitae;
  - c. a survey of the study results attained in academic courses so far;
  - d. a letter in which the student states why s/he wants to follow this programme in particular, what his/her expectations and ambitions are;
  - e. (if desired) results of former research projects, like reports or articles;
  - the names of three scientists willing to provide personal information on the applicant;
  - f. (if desired) other documents that the student thinks useful in furthering his/her application.

These documents are to be sent to the Faculty of Mathematics and Natural Sciences by 1 February preceding the start of the programme.

9. Sufficient knowledge of the English language can be proved by
  - a. Cambridge Certificate of Proficiency in English (A, B or C);
  - b. Cambridge Certificate in Advanced English (A, B or C);
  - c. an overall score of 6.5 or higher in the International English Language Testing System (Academic version);

- d. a score of at least 580 on the paper-based form of the Test of English as a Foreign Language;
- e. a score of at least 237 on the computer-based form of the Test of English as a Foreign Language;
- f. a score of at least 92 on the internet-based form of the Test of English as a Foreign Language.

An original certificate of the test, not older than two years, needs to be sent in. The Admissions Board may accept other proofs of knowledge of the English language that guarantee a comparable level of knowledge of English.