



university of  
 groningen

faculty of science  
 and engineering

physics

## **Appendices to the Teaching and Examination Regulations**

**2021-2022**

### **Master's degree programme in Applied Physics**

---

- I. Learning outcomes
- II. Tracks/specializations
- III. Content of the degree programme
- IV. Electives
- V. Entry requirements and compulsory order
- VI. Admission to the degree programme
- VII. Transitional provisions
- VIII. Additional Requirements Open degree Programmes
- IX. Application deadlines



## Appendix I Teaching outcomes of the degree programme (art. 3.1)

### 1. Knowledge and understanding

The master graduate in Applied Physics

- 1.1. understands the advanced concepts of physics, including the necessary mathematics and computer science, at a level which permits admission to a PhD programme;
- 1.2. is familiar with the advanced quantitative character of physics and with the relevant research methods;
- 1.3. has operational knowledge and design skills in the field of applied physics;
- 1.4. has a thorough understanding of the current state of the art in materials science, more specifically of structure, functional properties and characterisation of advanced materials;
- 1.5. has basic knowledge in the present field of business and management;

### 2. Application of knowledge and understanding

The master graduate in Applied Physics

- 2.1. is capable of carrying out research, aimed at understanding of physical phenomena that are potentially usable in applications, or is capable of developing applications of physical phenomena;
- 2.2. is capable of analyzing a (new) complex applied problem, and to use modelling skills to develop a structured and well-planned research approach;
- 2.3. is capable of applying his/her specific knowledge and mathematical, experimental, and computer skills to solve physical problems in his/her own and related subject areas and fields;
- 2.4. has developed an attitude aimed at seeking new applications;
- 2.5. has experience with the use of complicated apparatus and/or with the use of advanced programming tools;
- 2.6. has experience in application of applied physics in an industrial environment or in an applied physics research environment abroad;
- 2.7. is capable of collaborate in a (multi-disciplinary) research and design team;

### 3. Judgement

The master graduate in Applied Physics

- 3.1. is capable of obtaining relevant information using modern information channels, and to interpret this information critically;
- 3.2. is capable of managing and judging his/her and others' actions within a highly scientific and professional context, taking societal and ethical aspects into account;
- 3.3. is able to draw conclusions on the basis of limited or incomplete information, and is able to realize and formulate the limitations of such conclusions;

### 4. Communication skills

The master graduate in Applied Physics

- 4.1. is capable of communicating clearly in English, both verbally and in writing, on his/her subject and relevant applications, at a level which is understandable to experts and non-experts, and using modern communication tools;

### 5. Learning skills

The master graduate in Applied Physics

- 5.1. is capable of addressing issues inside as well as outside his/her main subject area, therefore and thereby gaining new knowledge and skills;
- 5.2. is able to recognize potential applications of recent advances in physics.



university of  
 groningen

faculty of science  
 and engineering

physics

## **Appendix II Tracks of the degree programme (art. 3.5)**

The degree programme of the Applied Physics master offers no separate tracks.



### Appendix III Content of the degree programme (art. 3.6)

The assessment method(s) of the courses below can be found in the assessment plan of the degree programme and on Ocasys.

Course unit	ECTS	Practical	Entry Requirements
Characterisation of Materials	5		
Computational Physics	5	X	
Cross-disciplinary Materials Science	5		
Functional Properties	5		
Mechanical Properties	5		
Mesosopic Physics	5		
Structure at Macro, Meso and Nano Scale	5		
Physics with Industry	5		
Optional courses in Applied Physics	20	See app. IV	See appendix IV
Industrial Internship	20		Passed 45 ECTS of the masters's degree programme
Master's Research Project (Applied Physics)	40	X	Passed 45 ECTS of the masters's degree programme



### Appendix IV Electives (art. 3.7.1)

The assessment method(s) of the courses below can be found in the assessment plan of the degree programme and on Ocasys.

Course unit	ECTS	Practical	Entry Requirements
Bio-inspired Designer Materials	5		
Memristive Devices	5		
Micromechanics	5		
Neuromorphic Circuit Design	5		
Opto-electronic devices	5		
Physics of Lasers	5	X	
Polymer Physics	5		
Robotics for IEM	5		
Smart Materials for Engineering	5		
Surface Interactions in Electromechanical Systems	5		
Surfaces and Interfaces	5		
Theoretical Condensed Matter Physics	5		
Ultrafast Time-resolved Spectroscopy	5	X	



university of  
 groningen

faculty of science  
 and engineering

physics

## **Appendix V Entry requirements and compulsory order of examinations (art. 4.4)**

For students admitted to the degree programme the conditional entry requirements for individual modules and order of examinations are listed in Ocasys.



## **Appendix VI Admission to the degree programme and different tracks (art. 2.1A.1 + 2.1B.1)**

Graduates of the Bachelor's degree programme in Applied Physics of the University of Groningen are considered to have adequate knowledge and skills to be admissible into the Master's degree programme of Applied Physics.

A dedicated 15 ECTS pre-master programme is composed for graduates of the Bachelor's degree programme in Physics of the University of Groningen and consists of the following three course units:

- Device Physics
- Physics of Fluids
- Solid State Physics

Bachelor Physics graduates who successfully complete this programme are considered admissible into the Master's degree programme of Applied Physics.



university of  
 groningen

faculty of science  
 and engineering

physics

## **Appendix VII Transitional provisions (art. 7.1)**

There are no transitional provisions for Applied Physics students.





university of  
 groningen

faculty of science  
 and engineering

physics

## **Appendix VIII Additional Requirements Open degree Programmes (Art. 5.6)**

In exceptional circumstances students wishing to pursue an open degree programme may file a request with the Board of Examiners of Physics and Applied Physics. The Board of Examiners will evaluate whether the proposed curriculum meets the learning outcomes of the degree programme.



## Appendix IX Application deadlines

Application and decision deadlines for admission  
(art. 2.6.1 and 2.6.3)

### Programmes starting on 1 September 2021

Programme	Deadline of Application	Deadline of decision
Behavioural and Cognitive Neurosciences	1 May 2021	1 June 2021
Biology	1 May 2021	1 June 2021
Biomedical Engineering	1 May 2021	1 June 2021
Biomedical Sciences	1 May 2021	1 June 2021
Biomolecular Sciences	1 May 2021	1 June 2021
Ecology and Evolution	1 May 2021	1 June 2021
Energy and Environmental Sciences	1 May 2021	1 June 2021
Human-Machine Communication	1 May 2021	1 June 2021
Marine Biology	1 May 2021	1 June 2021
Mechanical Engineering	1 May 2021	1 June 2021
Medical Pharmaceutical Sciences	1 May 2021	1 June 2021
Nanoscience: for non-EU/EEA students	1 February 2021	1 June 2021
Nanoscience: for EU/EEA students	1 May 2021	1 June 2021
Science Education and Communication	1 May 2021	1 June 2021

### Programmes starting on 1 September 2021 and 1 February 2022

Programme	Deadline of Application for 1 September	Deadline of decision for 1 September	Deadline of Application for 1 February	Deadline of decision for 1 February
Applied Mathematics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Applied Physics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Artificial Intelligence	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Astronomy	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Chemical Engineering	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Chemistry	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Computing Science	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Farmacie	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Industrial Engineering and Management	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Mathematics	1 May 2021	1 June 2021	15 October 2021	15 November 2021
Physics	1 May 2021	1 June 2021	15 October 2021	15 November 2021