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Appendices to the Teaching and Examination Regulations

2019-2020

Master's degree programme in Applied Physics



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 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.



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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		
Mesoscopic Physics	5		
Structure at Macro, Meso and Nano Scale	5		
Optional courses in Science	15	See app. IV	See appendix IV
Courses in Business and Management	5	See app. IV	See appendix IV
Industrial Internship	20		Passed 40 ECTS of the masters's degree programme
Master's Research Project (Applied Physics)	45	X	Passed 40 ECTS of the masters's degree programme



Appendix IV Electives (art. 3.7)

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

Electives are offered in the following categories:

Optional courses in Science: Applied Physics

Course unit	ECTS	Practical	Entry Requirements
Mechatronics	5		
Micromechanics	5		
Modern Laser Microscopy	5		
Robotics	5		
Statistical Signal Processing	5	X	

Optional courses in Science: Theoretical Physics

Course unit	ECTS	Practical	Entry Requirements
Advanced Quantum Mechanics	5		
Atomic and Molecular Interactions	5		
Mathematical Methods of Physics	5		
Non Linear Optics	5		
Statistical Methods in Physics	5		
Theoretical Condensed Matter Physics	5		

Optional courses in Science: Advanced Physics courses

Course unit	ECTS	Practical	Entry Requirements
Physics of Lasers	5	X	
Radiocarbon Dating and Analysis	5		
Radiation Physics	5		
Surfaces and Interfaces	5		
Ultrafast Time-Resolved Spectroscopy	5	X	

Optional courses in Science: Advanced Mathematics courses

Course unit	ECTS	Practical	Entry Requirements
Calculus of Variations and Optimal Control	5		
Computational Fluid Dynamics	5	X	
Computational Methods of Science	5	X	
Functional Analysis	5		
Numerical Mathematics 2	5	X	



Optional courses in Science: Chemistry and Chemical Engineering

Course unit	ECTS	Practical	Entry Requirements
Polymer Physics	5		
Technical Thermodynamics	5		

Business and Management

Course unit	ECTS	Practical	Entry Requirements
Environmental and Resource Economics	5		
Game Theory	5		
Global Change A	5	X	
Process Improvement and Change	5		
Strategic Management & Technology	5		
Sustainability for Engineers	5	X	
The student is allowed to choose other courses in Business and Management on individual approval of the Board of Examiners	5	See app. III or IV of the corresponding programme	See app. III or IV of the corresponding programme



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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.



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Appendix VI Admission to the degree programme and different tracks/specializations (art. 2.1.1 + art. 2.2)

Holders of the following Bachelor's degrees from the University of Groningen are considered to have sufficient knowledge and skills and will be admitted to the Master's degree programme in Applied Physics on that basis:

- BSc Applied Physics



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Appendix VII Transitional provisions (art. 7.1)

There are no transitional provisions for Applied Physics students.



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

**Programmes starting on 1 September 2020 and
 1 February 2021**

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 2020	1 June 2020	15 October 2020	15 November 2020
Applied Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Artificial Intelligence	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Astronomy	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemical Engineering	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Chemistry	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Computing Science	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Farmacie	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Industrial Engineering and Management	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Mathematics	1 May 2020	1 June 2020	15 October 2020	15 November 2020
Physics	1 May 2020	1 June 2020	15 October 2020	15 November 2020