university of groningen / faculty of science and engineering / applied physics

Appendices to the Teaching and Examination Regulations for the

Master's degree programme in Applied Physics

2026-2027

Appendix I. Learning outcomes of the Master's 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 acquired specific knowledge and mathematical, experimental, and computer skills to solve physical problems in the relevant subject area, as well as 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. Assessment

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 assessing personal 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 the 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 the main subject area, therefore and thereby gaining new knowledge and skills;
5.2. is able to recognize potential applications of recent advances in physics.

Appendix II. Tracks/specializations (Art. 3.6)

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

Appendix III. Content of the degree programme (Art. 3.7.1)

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

Course unit (course code)	ECTS	Entry Requirements
Characterisation of Materials (WMPH021-05)	5	
Computational Physics (WMPH007-05)	5	
Mechanical Properties (WMPH023-05)	5	
Nanoelectronics and Mesoscopic Physics (WMPH058-05)	5	
Physics with Industry (WMPH041-05)	5	
Properties of Functional Materials (WMPH051-05)	5	
Structure at Macro, Meso and Nano Scale (WMPH020-05)	5	
Optional courses in Applied Physics	25	See appendix IV
Industrial Internship (WMPH003-20)	20	Passed 45 ECTS of the masters's degree programme
Applied Physics Master Research Project (WMPH901-40)	40	Passed 45 ECTS of the masters's degree programme

Appendix IV. Electives (Art. 3.8.1)

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

Course unit (course code)	ECTS	Entry Requirements
Bioinspired Designer Materials (WMCH009-05)	5	
Engineering Design Integration (WMEE029-05)	5	
Memristive Devices (WMPH043-05)	5	
Multibody and Non-Linear Dynamics (WMME009-05)	5	
Nanoscale Material Modelling (WMPH053-05)	5	
Neuromorphic Circuit Design (WMPH044-05)	5	
Optoelectronic Devices (WMPH042-05)	5	
Physics of Lasers (WMPH027-05)	5	
Polymer Physics (WMCH025-05)	5	
Quantum Technology (WMPH057-05)	5	
Robotics for IEM (WMIE005-05)	5	
Smart Materials for Engineering (WMME021-05)	5	
Surface Interactions in Electromechanical Systems (WMPH045-05)	5	
Surfaces and Interfaces (WMPH014-05)	5	
Theoretical Condensed Matter Physics (WMPH031-05)	5	
Ultrafast Time-resolved Spectroscopy (WMPH040-05)	5	

Appendix V. Entry requirements and compulsory order (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 (Art. 2.1A.1, 2.1A.2 and 2.1B.1)

Direct admission
Graduates of the following Bachelor's degree programmes are considered to have adequate knowledge and skills to be admissible into the Master's degree programme in Physics:

- BSc Astronomy, University of Groningen
- BSc Applied Physics, University of Groningen
- BSc Physics, University of Groningen

- BSc Applied Physics, TU Delft
- BSc Applied Physics, University of Twente
- BSc Astronomy, Leiden University
- BSc Natuur- en sterrenkunde/Physics and Astronomy, Utrecht University
- BSc Physics & Astronomy, Radboud University
- BSc Physics & Astronomy, University of Amsterdam/Vrije Universiteit Amsterdam
- BSc Physics, Leiden University

BSc Life Science & Technology (LS&T)
Graduates of the Bachelor's degree programme in Life Science & Technology (LS&T) of the University of Groningen are admissible if they followed the Physics specialisation within their Bachelor's degree programmes.

Admissions Office
Students with a background in a physics or related bachelor's degree programme and interested in pursuing a master's degree programme in Applied Physics are encouraged to apply through the Admissions Office of the Faculty of Science and Engineering. The Board of Admissions of Physics and Applied Physics will then assess the application and decides whether the applicant has sufficient background to register for the programme, possibly after following a bridging pre-master's programme.

Appendix VII. Pre-master's programmes and Fast-Track programmes (Art. 2.3)

A. Pre-Master's programmes

The MSc Applied Physics programme does not provide fixed pre-master's programmes for entry into the MSc Applied Physics programme.

Depending on the previous education of an applicant, there is the possibility to follow a tailored pre-master's programme, up to a maximum of 60 ECTS, which facilitates entry into the MSc Applied Physics programme. Admission to this pre-master's programme is determined on an individual base by the Board of Admissions, which also designs the programme's content.

B. Fast-Track programmes

The MSc Applied Physics programme does not offer Fast-Track programmes for entry into the MSc Applied Physics programme.

Appendix VIII. Transitional provisions (Art. 7.1)

8.1 Transitional arrangement 2026-2027

Discontinued course units				**Substitute course units**				
Course code	*Course name*	*ECTS*	*Final exam*	*Course code*	*Course name*	*ECTS*	*Explanation*	*Equivalent Yes/No*
WMPH037-05	Mesoscopic Physics	5	25/26	WMPH058-05	Nanoelectronics and Mesoscopic Physics	5	Replacement	Yes
WMPH052-05	Nanomaterials Synthesis and Engineering	5	26/27	-	-	-	See below	No

The course "Nanomaterials Synthesis and Engineering" (WMPH052) has been discontinued as of academic year 2026/2027 and will not be replaced by a dedicated substitute course. Students who still need to pass the course will have the opportunity to either sit the final examinations or to take an additional elective instead.

8.2 Transitional arrangement 2025-2026

No transitional arrangements.

8.3 Transitional arrangement 2024-2025

No transitional arrangements.

8.4 Transitional arrangement 2023-2024

Discontinued course units				**Substitute course units**				
Course code	*Course name*	*ECTS*	*Final exam*	*Course code*	*Course name*	*ECTS*	*Explanation*	*Equivalent Yes/No*
WMPH049-05	Cross-disciplinary Materials Science	5	23/24	WMPH078-05	Nanomaterials Synthesis and Engineering	5	Replacement	Yes
WMPH015-05	Functional Properties	5	23/24	WMPH051-05	Properties of Functional Materials	5	New name	Yes

8.5 Transitional arrangement 2022-2023

No transitional arrangements.

Appendix IX. Additional Requirements Open Degree Programmes (Art. 3.10)

Students wishing to pursue an open degree programme may file a request with the Board of Examiners of Physics. The Board of Examiners will evaluate whether the proposed curriculum meets the learning outcomes of the degree programme.