

Curriculum master Applied Physics for students enrolled 2021/2022

First and second year (M1 en M2)		
Course code	Name	EC
M1		
Compulsory courses (20 EC)		
191411291	Applied Quantum Mechanics	5
201900080	Mathematical and Numerical Physics	5
191470241	Heat and Mass Transfer	5
201900282	Small Signals and Detection	4
201900281	Ethical and Cultural Awareness	1
Specialization courses (20 EC)		20
Elective courses physics/technical		10
Elective courses free		10/0
M2		
Internship, 193599010 / 201700185		20/30
Master's Assignment, General Aspects 201800345 / Physical Aspects 201800344		40
Total master		120

Chair courses Applied Physics

Organised in research clusters

Applied Nanophotonics		
Adaptive Quantum Optics (AQO), prof.dr. P.W.H. Pinkse		
<i>Specialisation courses</i>		
201300141	Wave Optics	5
202100078	Quantum Information	5
202100083	Quantum Optics	5
1 out of 3:		
191210880	Integrated Optics	5
201300139	Laser Physics	5
193520030	Nonlinear Optics	5
<i>Recommended elective courses, all of the above plus:*</i>		
201100074	Nanophotonics	5
201100075	Nanophotonic Experiments	5
193570050	Advanced Quantum Mechanics	5
BioMedical Photonic Imaging (BMPI), prof.dr.ir. W. Steenbergen		
<i>Specialisation courses</i>		
201300141	Wave Optics	5
193500000	Biomedical Optics	5
193542070	Medical Acoustics	5
-	1 of the recommended elective courses	5
<i>Recommended elective courses:*</i>		
193640020	Biophysical Techniques and Molecular Imaging	5
201800114	Imaging Technology in Radiology	5
191210910	Image Processing and Computer Vision	5
201100254	Advanced Computer Vision and Pattern Recognition	5
201500583	Machine Learning for Medical Applications	5

Complex Photonic Systems (COPS), prof.dr. W.L. Vos		
<i>Specialisation courses</i>		
201300141	Wave Optics	5
201300139	Laser Physics	5
201100074	Nanophotonics	5
201100075	Nanophotonic Experiments	5
<i>Recommended elective courses:*</i>		
201400196	Quantum Emitters	5
193520030	Nonlinear Optics	5
193510040	Theoretical Solid State Physics	5
201500405	Complex Function Theory	5
201700034	Introduction to Partial Differential Equations	3
193570050	Advanced Quantum Mechanics	5
193520040	Experimental Laser Physics and Nonlinear Optics	5
202100083	Quantum Optics	5
Laser Physics and Nonlinear Optics (LPNO), prof.dr. K.J. Boller		
<i>Specialisation courses</i>		
201300139	Laser Physics	5
201300141	Wave Optics	5
193520030	Nonlinear Optics	5
193520040	Experimental Laser Physics and Nonlinear Optics	5
<i>Recommended elective courses:*</i>		
202100083	Quantum Optics	5
191210880	Integrated Optics	5
193570050	Advanced Quantum Mechanics	5
201500405	Complex Function Theory	3
202100078	Quantum Information	5
Optical Sciences (OS), prof.dr.ir. H.L. Offerhaus		
<i>Specialisation courses</i>		
201300141	Wave Optics	5
191210880	Integrated Optics	5
-	1 of the recommended elective courses	5
1 out of 2:		
201300139	Laser Physics	5
193520030	Nonlinear Optics	5
<i>Recommended elective courses, the aforementioned 2 plus:*</i>		
193520040	Experimental Laser Physics and Nonlinear Optics	5
193400131	Nano-Optics	5
193400141	Nano-Electronics	5
201500405	Complex Function Theory	5
202000663	Molecular Structure and Spectroscopy (part of AT module 9)	2.5

Energy, Materials and Systems

Energy Materials & Systems (EMS), prof.dr.ir. H.J.M. ter Brake

Specialisation courses

193530000	Introduction to Superconductivity	5
201100214	Applications of Superconductivity	5
201100146	Cryogenic Science and Technology	5
-	Course in consultation with chair	5

Recommended elective courses:*

193570010	Advanced Fluid Mechanics	5
193510040	Theoretical Solid State Physics	5
193550020	Surfaces and Thin Layers	5
193530040	Introduction to High Energy Physics	5
193530010	Nanophysics	5
193580020	Experimental Techniques in Physics of Fluids	5
201700026	Electrical Power Engineering and System Integration	5
201400037	Linear Solid Mechanics	5
201800131	Numerical Methods for Engineers	5
193565000	Capillarity Phenomena	5

Nano Electronic Materials

Computational New Name (CCP/CMS), prof.dr. C. Filippi

Specialisation courses

193570050	Advanced Quantum Mechanics	5
193510040	Theoretical Solid State Physics	5
202100210	Electronic Structure Theory	5
-	Course in consultation with chair	5

Recommended elective courses:*

202100078	Quantum Information	5
200900066	Introduction to the Physics of Correlated Electrons	5
193570040	Theory of General Relativity	5
193530010	Nanophysics	5
201500405	Complex Function Theory	5
202000694	Classical Mechanics	4
202100223	Computational Physics	5

Industrial Focus Group XUV Optics (XUV), prof.dr. M.D. Ackermann

Specialisation courses

193530010	Nanophysics	5
193550020	Surfaces and Thin Layers	5
202100209	X-rays for Science and Technology	5
1 out of 3:		
193700040	AMM-Inorganic Materials Science	5
193700010	AMM-Characterisation	5
201300141	Wave Optics	5

Recommended elective courses, the aforementioned 3 plus:*

193510040	Theoretical Solid State Physics	5
193570050	Advanced Quantum Mechanics	5
191210730	Technology	5

Inorganic Materials Science (IMS), prof.dr.ing. A.J.H.M. Rijnders		
<i>Specialisation courses</i>		
193700010	AMM-Characterization	5
193700040	AMM-Inorganic Materials Science	5
-	Course in consultation with chair	5
1 out of 3:		
193550020	Surfaces and Thin Layers	5
201300141	Wave Optics	5
201700025	Solar Energy	5
<i>Recommended elective courses:*</i>		
193510040	Theoretical Solid State Physics	5
193530010	Nanophysics	5
201300139	Laser Physics	5
200900066	Introduction to the Physics of Correlated Electrons	5
193530000	Introduction to Superconductivity	5
Interfaces and Correlated Electron Systems (ICE), prof.dr.ir. J.W.M. Hilgenkamp		
<i>Specialization courses</i>		
193510040	Theoretical Solid State Physics	5
193530010	Nanophysics	5
193530000	Introduction to Superconductivity	5
-	Course in consultation with chair	5
<i>Recommended elective courses:*</i>		
200900066	Introduction to the Physics of Correlated Electrons	5
202100078	Quantum Information	5
Physics of Interfaces and Nanomaterials (PIN), prof.dr.ir. H.J.W. Zandvliet		
<i>Specialisation courses</i>		
193530010	Nanophysics	5
193550020	Surfaces and Thin Layers	5
201500167	Modern Topics in Condensed Matter Physics	5
-	Course in consultation with chair	5
<i>Recommended elective courses:*</i>		
193510040	Theoretical Solid State Physics	5
200900066	Introduction to the Physics of Correlated Electrons	5
201100254	Advanced Computer Vision and Pattern Recognition	5
Quantum Transport in Matter (QTM), prof.dr.ir. A. Brinkman		
<i>Specialisation courses</i>		
193510040	Theoretical Solid State Physics	5
193530010	Nanophysics	5
193530000	Introduction to Superconductivity	5
-	Course in consultation with chair	5
<i>Recommended elective courses:*</i>		
200900066	Introduction to the Physics of Correlated Electrons	5
202100078	Quantum Information	5

Physics of Fluids		
Physics of Fluids (PoF), prof.dr. D. Lohse		
<i>Specialisation courses</i>		
193570010	Advanced Fluid Mechanics	5
193580020	Experimental Techniques in Physics of Fluids	5
10 EC out of:		
193565000	Capillarity Phenomena (recommended)	5
193580010	Turbulence (recommended)	5
201400194	Granular Matter	5
201400195	Fluids and Elasticity	2.5
193572010	Physics of Bubbles	2.5
193542070	Medical Acoustics	5
1 out of 2 (not both, due to overlap):		
201800131	Numerical Methods for Engineers	5
191154731	Computational Fluid Dynamics	5
<i>Recommended elective courses, all of the above plus:*</i>		
201500405	Complex Function Theory	3
191560430	Nonlinear Dynamics	5
202001413	Soft Matter Physics	5
193400121	Nano-Fluidics	5

Soft Matter		
BioElectronics (BE), prof.dr. S.J.G. Lemay		
<i>Specialisation courses</i>		
202001413	Soft Matter Physics	5
202001414	Physical Biology	5
193400121	Nano-Fluidics	5
-	Course in consultation with chair	5
<i>Recommended elective courses:*</i>		
201300137	Ions and Devices	5
193565000	Capillarity Phenomena	5
201800083	Advanced Colloids and Interfaces	5
201700187	Soft and Biological Techniques**	5
Nano BioPhysics (NBP), prof.dr. M.M.A.E. Claessens		
<i>Specialisation courses</i>		
202001414	Physical Biology	5
193640020	Biophysical Techniques and Molecular Imaging	5
-	Courses in consultation with chair	10
<i>Recommended elective courses:*</i>		
202001413	Soft Matter Physics	5
201400196	Quantum Emitters	5
193400111	Bionanotechnology	5
201700187	Soft and Biological Techniques**	5
201300141	Wave Optics	5
193400131	Nano-Optics	5
201300139	Laser Physics	5
193520040	Experimental Laser Physics and Nonlinear Optics	5
193700010	AMM-Characterization	5

Physics of Complex Fluids (PCF), prof.dr. F.G. Mugele

Specialisation courses

193565000	Capillarity Phenomena	5
193400121	Nano-Fluidics	5
202001413	Soft Matter Physics	5
-	Course in consultation with chair	5

Recommended elective courses:*

201800083	Advanced Colloids and Interfaces	5
201700187	Soft and Biological Techniques**	5
193570010	Advanced Fluid Mechanics	5
201400195	Fluids and Elasticity	2.5
193730060	Polymer Physics	5

* For every chair, a specific Capita Selecta course (CS) is available, for activities done in the chair not belonging to regular courses. The content, form and size are in agreement with the chair. There is a [Grade form CS courses AP](#) to register course code, name, EC, subject, material used, assessment and a title.

** Soft and Biological Techniques requires previous knowledge, depending on your specific background. In addition, there is a maximum number of students that can participate. Please contact [Michel Duits](#).