Curriculum master Applied Physics for students enrolled 2020/2021

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

Organized in research clusters

Applied Nanophotonics		
Adaptive Quantum Optics (AQO), prof.dr. P.W.H. Pinkse		
Specialization courses		
201300141	Wave Optics	5
193515000	Quantum Optics	5
-	Course in consultation with chair	5
1 out of 3:		
191210880	Integrated Optics	5
201300139	Laser Physics	5
193520030	Nonlinear Optics	5
Recommended elective courses, all of the above plus::		
201100074	Nanophotonics	5
201100075	Nanophotonic Experiments	5
193570050	Advanced Quantum Mechanics	5
202001428	Capita Selecta AQO*	-
BioMedical Photonic Imaging (BMPI), prof.dr.ir. W. Steenbergen		
Specialization courses		
201300141	Wave Optics	5
193500000	Biomedical Optics	5
193640020	Medical Acoustics	5
-	1 of the recommended elective courses	5
Recommended elective courses:		
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
201600260	Capita Selecta BMPI*	5

Complex Photonic Systems (COPS), prof.dr. W.L. Vos

Specialization courses

201300141	Wave Optics	5
193515000	Quantum Optics	5
201100074	Nanophotonics	5
201100075	Nanophotonic Experiments	5

Recommended elective courses:

201300139	Laser Physics	5
201400196	Quantum Emitters	5
193520030	Nonlinear Optics	5
193510040	Theoretical Solid State Physics	5
201500405	Theory of Complex Functions	3
201700034	Introduction to Partial Differential Equations	5
193570050	Advanced Quantum Mechanics	5
193520040	Experimental Laser Physics and Nonlinear Optics	5
193515900	Capita Selecta COPS*	-

Laser Physics and Nonlinear Optics (LPNO), prof.dr. K.J. Boller

Specialization courses

201300139	Laser Physics	5
201300141	Wave Optics	5
193520030	Nonlinear Optics	5
193520040	Experimental Laser Physics and Nonlinear Optics	5

Recommended elective courses:

193515000	Quantum Optics	5
191210880	Integrated Optics	5
193570050	Advanced Quantum Mechanics	5
201500405	Theory of Complex Functions	3
193520900	Capita Selecta LPNO*	-

Optical Sciences (OS), dr.ir. H.L. Offerhaus (chair)

Specialization courses

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

Recommended elective courses, the aforementioned 2 plus::

193520040	Experimental Laser Physics and Nonlinear Optics	5
193400131	Nano-Optics	5
193400141	Nano-Electronics	5
201500405	Theory of Complex Functions	5
202000663	Molecular Structure and Spectroscopy (part of AT module 9)	2.5
193540900	Capita Selecta OS*	-

Energy, Materials and Systems

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

Specialization 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
200900059	Capita Selecta EMS*	-

Nano Electronic Materials

Computational Chemical Physics (CCP), prof.dr. C. Filippi

Specialization courses		
193570050	Advanced Quantum Mechanics	5
193510040	Theoretical Solid State Physics	5
202000713	Computational Physics	5
-	Course in consultation with chair	5
Recommended elective courses:		
202001413	Soft Matter Physics	5
200900066	Introduction to the Physics of Correlated Electrons	5
193570040	Theory of General Relativity	5
202000694	Classical Mechanics	4
201600262	Capita Selecta CCP*	-

Computational Materials Science (CMS), prof.dr. P.J. Kelly

Specialization courses		
193510040	Theoretical Solid State Physics	5
193510020	Electronic Structure Theory 1	5
193510030	Electronic Structure Theory 2	5
193530010	Nanophysics	5
Recommended elective courses:		
193570050	Advanced Quantum Mechanics	5
200900066	Introduction to the Physics of Correlated Electrons	5
201500405	Theory of Complex Functions	3
-	Optics Courses	-
193510900	Capita Selecta CMS*	-

Industrial Focus Group XUV Optics (XUV), prof.dr. F. Bijkerk

Specialization courses		
193530010	Nanophysics	5
193550020	Surfaces and Thin Layers	5
193700040	AMM-Inorganic Materials Science	5
-	Course in consultation with chair	5
Recommended elective courses:		
193510040	Theoretical Solid State Physics	5
193570050	Advanced Quantum Mechanics	5
191210730	Technology	5
201300141	Wave Optics	5
201600261	Capita Selecta XUV*	-

Inorganic Materials Science (IMS), prof.dr.ing. A.J.H.M. Rijnders

Specialization courses

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

Recommended elective courses:

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
193770000	Capita Selecta IMS*	-

Interfaces and Correlated Electron Systems (ICE), prof.dr.ir. J.W.M. Hilgenkamp

Specialization courses

193510040	Theoretical Solid State Physics	5
193530010	Nanophysics	5
193530000	Introduction to Superconductivity	5
-	Course in consultation with chair	5

Recommended elective courses:

200900066	Introduction to the Physics of Correlated Electrons	5
200900060	Capita Selecta ICE*	-

Physics of Interfaces and Nanomaterials (PIN), prof.dr.ir. H.J.W. Zandvliet

Specialization courses

193530010	Nanophysics	5
193550020	Surfaces and Thin Layers	5
201500167	Modern Topics in Condensed Matter Physics	5
-	Course in consultation with chair	5

Recommended elective courses:

193510040	Theoretical Solid State Physics	5
200900066	Introduction to the Physics of Correlated Electrons	5
201000244	Capita Selecta PIN*	-

Quantum Transport in Matter (QTM), prof.dr.ir. A. Brinkman

Specialization courses

193510040	Theoretical Solid State Physics	5
193530010	Nanophysics	5
193530000	Introduction to Superconductivity	5
-	Course in consultation with chair	5

Recommended elective courses:

200900066	Introduction to the Physics of Correlated Electrons	5
201000304	Capita Selecta QTM*	-

Physics of Fluids

Physics of Fluids (PoF), prof.dr. D. Lohse
Specialization courses

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

Recommended elective courses, all of the above plus:

201500405	Theory of Complex Functions	3
191560430	Nonlinear Dynamics	5
202001413	Soft Matter Physics	5
193400121	Nano-Fluidics	5
193580900	Capita Selecta PoF*	-

Soft Matter

BioElectronics (BE), prof.dr. S.J.G. Lemay
Specialization courses

202001413	Soft Matter Physics	5
202001414	Physical Biology	5
201300137	Ions and Devices	5
193400121	Nano-Fluidics	5

Recommended elective courses:

193565000	Capillarity Phenomena	5
201800083	Advanced Colloids and Interfaces	5
201700187	Soft and Biological Techniques**	5
201800224	Capita Selecta BE*	5

Nano BioPhysics (NBP), prof.dr. M.M.A.E. Claessens
Specialization courses

202001414	Physical Biology	5
193640020	Biophysical Techniques and Molecular Imaging	5
-	Courses in consultation with chair	10

Recommended elective courses:

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
200900058	Capita Selecta NBP*	-

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

Specialization 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
193565900	Capita Selecta PCF*	-

* The Capita Selecta course is used for activities done in the chair not belonging to regular courses. The content, form and size is 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.