

# Applied Physics Master Programme 2018/2019

(See also the [Curriculum Master APH](#) for all the Applied Physics Curricula and the [Transitional Arrangements](#))

## Compulsory Courses APH

Quarter	Course Code	Course Name	EC
1A	191411291	Applied Quantum Mechanics (Kelly)	5.0
1B	191551150	Numerical techniques for PDE (Geurts)	5.0
2A	191470241	Heat and Mass Transfer (van der Meer)	5.0
2B	201800422	Small Signals and Detection	5.0
-	193599010 or 201700185	Internship 20 EC or Internship 30 EC (Folkers)	20 or 30
-	201800344 and 201800345	Master Thesis Physical Aspects and General Aspects (Kooij)	40

## Fluid/Soft Matter Courses

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	193570010	Advanced Fluid Mechanics (Huisman)	5.0	PoF	EMS, PCF CCP, PoF BE, NBP, PCF BE, PCF
	201300135	Soft and Biological Matter (Lemay)	5.0	BE, NBP, PCF	
	201700187	Soft and Biological Techniques (Duits) <sup>2)</sup>	5.0		
	201800083	Advanced Colloids and Interfaces (Wood)	5.0		
1B	193580010	Turbulence (Lohse)	5.0	PoF	
	193572010	Physics of Bubbles (Versluis)	2.5	PoF	
2A	193580020	Experimental Techniques in PoF (Gomez)	5.0	PoF	EMS PoF
	193400121	Nano-Fluidics (Siretanu)	5.0	PCF, BE	
	201400194	Granular Matter (v.d. Meer)	5.0	PoF	
	193542070	Medical Acoustics (Versluis)	5.0	PoF, BMPI	
2B	201400195	Fluids and Elasticity (Snoeijer)	2.5	PoF	BE
	193565000	Capillarity Phenomena (Mugele)	5.0	PoF, PCF	
-	201300137	Ions and Devices (Lemay)	5.0	BE	

## Materials Courses

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	193510040	Theoretical Solid State Physics (Kelly)	5.0	ICE, QTM, CMS, CCP	COPS, EMS, XUV, PIN, IMS
	193530000	Intr. to Superconductivity (Dhalle)	5.0	ICE, QTM, EMS	
	193700010	AMM - Characterization (Huijser)	5.0	IMS	
1B	193550020	Surfaces and Thin Layers (Wormeester)	5.0	PIN, XUV, IMS	EMS
	201100214	Applications of Superconductivity (Dhalle)	5.0	EMS	
	193510020	Electronic Structure Theory 1 (Kelly)	5.0	CMS	
	201500167	MTCMP (van Houselt)	5.0	PIN	
	193400141	Nano-Electronics (v.d. Wiel)	5.0		
2A	193530010	Nanophysics (Zandvliet)	5.0	PIN, ICE, QTM, CMS, XUV	EMS, IMS
	193510030	Electronic Structure Theory 2 (Brocks)	5.0	CMS	
	193700040	AMM-Inorganic Materials Science (Koster)	5.0	IMS, XUV	
2B	201100146	Cryogenic Science and Techn. (ter Brake)	5.0	EMS	CCP, CMS, ICE, QTM, PIN
	200900066	Intr. to the Physics of Corr. Electrons (Golubov)	5.0		

## Optics Courses

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	201300139	Laser physics (Boller)	5.0	LPNO, OS	COPS, NBP LPNO NBP BMPI
	193515000	Quantum Optics (Pinkse)	5.0	COPS	
	193400131	Nano-Optics (Garcia-Blanco)	5.0		
	193640020	Biophysical Techn. and Mol. Imaging (Otto)	5.0	NBP	
1B	201100074	Nanophotonics (Vos)	5.0	COPS	COPS
	193520030	Nonlinear Optics (Boller)	5.0	LPNO, OS	
2A	201300141	Wave Optics (vd Slot)	5.0	LPNO, OS, COPS, BMPI	XUV, NBP COPS NBP
	201400196	Quantum Emitters (Vos)	5.0		
	191210880	Integrated Optics (Garcia Blanco)	5.0	OS	
	193400111	Bionanotechnology (Bennink)	5.0		
2B	193500000	Biomedical Optics (Vellekoop)	5.0	BMPI	
-	201100075	Nanophotonic Experiments (Vos/Pinkse) <sup>3)</sup>	5.0	COPS	COPS, NBP, OS
	193520040	Exp. Laser Physics and Nonlinear Optics (Bastiaens for LPNO / Offerhaus for OS) <sup>3)</sup>	5.0	LPNO	

**General Physics Courses**

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	201800166 193640060	Classical Mechanics (Filippi) <sup>6)</sup> Radiation Expertise (v. Dijk) <sup>3)</sup>	4		
1B	193530040 193570050	Introduction to High Energy Physics (v. Eijk) Advanced Quantum Mechanics (Brocks)	5 5	CCP	COPS, CMS, XUV, LPNO
2A					
2B	193570040	Theory of General Relativity (Briels)			CCP
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**Applied Physics/Engineering Courses**

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	201800338 201600180	Engineering Solid Mechanics (de Boer) <sup>6)</sup> Molecular Struct. and Spectr. (Huijser) <sup>4)</sup>	4 2,5		OS
1B	191210730 201700026	Technology (Kovalgin) Electr.Power Eng. and System Integr. (Dhalle)	5 5		XUV EMS
2A	191407051 201400037 201700025 193530050	Intr. to Instr.computers (Veugelers) Linear Solid Mechanics (Ellenbroek) Solar Energy (Reinders) Magn. Methods for (Neuro) Imaging (Haken)	2.5/5 5 5 5		EMS
2B	201700024	Wind Energy (Venner)	5		
-	191211000	Advanced semiconductor devices (Salm) <sup>3)</sup>	5		

**Mathematics Courses**

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	191560430	Nonlinear Dynamics (Meijer)	5		PoF
1B					
2A	201700034	Introduction to PDE (Akkaya)	5		COPS
2B	201500405	Theory of Complex Functions (Jeurnink)	3		COPS, CMS, LPNO, OS, PoF

**Computer/Programming Courses**

Quarter	Code	Course	EC	SC <sup>1)</sup>	RC <sup>1)</sup>
1A	201600070 191158510	Basic Machine Learning Programming in Engineering	5 3		
1B	201600071 192140200 201500363 191158500	Advanced Machine Learning Algoritmen, Datastructuren en Complexiteit Data Science Advanced Programming in Engineering	5 5 5 5		
2A	201700176 201700177 191210910 201800482	Computational Physics 1 (Filippi) Computational Physics 2 <sup>5)</sup> (Filippi) Image Processing and Computer Vision Machine Learning	2.5 2.5 5 3/5	CCP CCP	BMPI
2B	201100254 201500583	Adv. Comp. Vision and Pattern Recognition Machine Learning for Medical Applications	5 1.5		BMPI BMPI

The curriculum of Applied Physics contains 20 EC elective courses. The elective courses can be Specialization Courses of another research group listed in the Applied Physics Master Programme. The elective courses can be courses of other departments (see website of this department) or extra courses given by Applied Physics listed above. The curriculum of Applied Physics contains for every research group a list of Recommended (elective) Courses. The Recommended Courses of other departments are also listed above. For these students who want to extend the Internship to 30 EC, the 10 EC Elective Courses can be used.

Capita Selecta courses are 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 special [registration form](#) where beside course code, name, and EC, the subject, the material used, the assessment and a title is registered. The title is visible on the certificate supplement.

<sup>1)</sup> SC is Specialization Courses, RC is Recommended Courses, see also [Curriculum APH](#).

<sup>2)</sup> Soft and Biological Techniques can only be done in combination with Soft and Biological Matter. It is open for master students when the maximum of student places for the minor participants is not reached. Please contact the teaching staff.

<sup>3)</sup> Students who want to participate in this course, please contact the teaching staff.

<sup>4)</sup> Part of AT Module 09 Condensed Matter Physics (201800130)

<sup>5)</sup> Computational Physics 1 is pre knowledge for Computational Physics 2

<sup>6)</sup> This course is part of the Bachelor TN module M05 Signals, Models en Systems, course code 201800159. To participate in this course/module part you have to register for the whole module. The schedule can be found on the module code.