Applied Physics (pre)master's programme 2020/2021
Side-entry students hbo TN and EE

(See also the **Curriculum master AP** for all the Applied Physics curricula and the **Transitional arrangements AP**.
It is advisable to make an appointment to discuss your study planning with the AP study advisor, before the start of the academic year.)

Premaster/transfer minor

Quartile	Course code	Name	EC
1A	202001172	Calculus A for pre masters (van Ommeren)	4.0
1A	202001178	Linear Algebra (Timmer)	3.0
1A	202001435	Models for DB and PM (Van Veldhoven)	4.5
1A/1B	202000701	Inleiding Vastestoffysica (Van Houselt)	7.0
1B	202001174	Calculus B for pre masters (Van Ommeren)	3.0
1B	191403070	Electriciteit en Magnetisme PM (Verschuur)	5.0
1B	202000697	Optica Theory for PM (Saive)	4.5
Total premaster			**31**

General physics courses (homologation)

Quartile	Course code	Name	EC
1B	202000699	Hilbert Space (Van Damme)	2.0
1B	202000698	Quantum Mechanics (Brinkman)	6.0
2A	202000703	Partial Differential Equations (Geurts)	2.0
2A	202000702	Statistical Physics (Mugele)	6.0
2B	202000706	Electrodynamics (Brocks)	6.0
2B	202000707	Numerical Methods for PDE (Geurts)	2.0
2B	202000705	Fluid Physics (Van der Meer)	7.0

Compulsory courses

Quartile	Course Code	Course Name	EC
1A	191411291	Applied Quantum Mechanics (Kelly)	5.0
1B	201900080	Mathematical and Numerical Physics (Stevens)	5.0
2A	191470241	Heat and Mass Transfer (Krug)	5.0
2B	201900282	Small Signals and Detection (Marpaung)	4.0
2B	201900281	Ethical and Cultural Awareness (Offerhaus)	1.0
-	201800344 201800345	Master's Assignment, Physical Aspects (Kooij) (20 EC) Master's Assignment, General Aspects (Kooij) (20 EC)	40

Specialization courses

The specializations are divided into Applied Physics research groups. Below are the AP master's courses arranged per research cluster.

Applied Nano-Photonics

Quartile	Code	Course	EC	SC[1)]	RC[1)]
1A	201300139	Laser Physics (Boller)	5.0	LPNO, OS	AQO, COPS, NBP, IMS
	193515000	Quantum Optics (Pinkse)	5.0	AQO, COPS	LPNO
	202000663	Molecular Struct. and Spectr. (Huijser)[4)]	2.5		OS
	193400131	Nano-Optics (Garcia-Blanco)	5.0		NBP, OS
1B	193520030	Nonlinear Optics (Boller)	5.0	LPNO, OS	AQO, COPS
	193400141	Nano-Electronics (v.d. Wiel)	5.0		OS
2A	201300141	Wave Optics (vd Slot)	5.0	AQO, BMPI, COPS, LPNO, OS	NBP, XUV
	201100074	Nanophotonics (Vos)	5.0	COPS	AQO
	191210880	Integrated Optics (Garcia Blanco)	5.0	OS	AQO, LPNO
	201700034	Introduction to PDE (Akkaya)	5.0		COPS
2B	201400196	Quantum Emitters (Vos)	5.0		COPS, NBP
-	201100075	Nanophotonic Experiments (Vos/Pinkse)[3)]	5.0	COPS	AQO
	193520040	Exp. Laser Physics and Nonlinear Optics (Bastiaens for LPNO / Offerhaus for OS)[3)]	5.0	LPNO	COPS, NBP, OS

Energy Materials and Systems

Quartile	Code	Course	EC	SC[1)]	RC[1)]
1A	193530000	Intr. to Superconductivity (Dhalle)	5.0	EMS, ICE, QTM	IMS
1B	201100214	Applications of Superconductivity (Dhalle)	5.0	EMS	
	193530040	Introduction to High Energy Physics[3)] (v. Eijk)	5.0		EMS
	201700026	Electr. Power Eng. and Sys. Integr. (Dhalle)	5.0		EMS
2A	201400037	Linear Solid Mechanics (Ellenbroek)	5.0		EMS
2B	201100146	Cryogenic Science and Techn. (ter Brake)	5.0	EMS	

Nano-Electronic materials

Quartile	Code	Course	EC	SC[1)]	RC[1)]
1A	193530010	Nanophysics (Zandvliet)	5.0	CMS, ICE, PIN, QTM, XUV	EMS, IMS
	193530000	Intr. to Superconductivity (Dhalle)	5.0	EMS, ICE, QTM	IMS
	202000694	Classical Mechanics	4.0		CCP
	193700010	AMM - Characterization (Huijser)	5.0	IMS	NBP
1B	193510040	Theoretical Solid State Physics (Kelly)	5.0	CCP, CMS, ICE, QTM	COPS, EMS, IMS, PIN, XUV
	193570050	Advanced Quantum Mechanics (Brocks)	5.0	CCP	AQO, COPS, CMS, XUV, LPNO
	191210730	Technology (Kovalgin)	5.0		XUV
2A	193550020	Surfaces and Thin Layers (Wormeester)	5.0	IMS, PIN, XUV	EMS
	193510030	Electronic Structure Theory 2 (Brocks)[5)]	5.0	CMS	
	202000713	Computational Physics (Filippi)	2.5/ 5.0	CCP	
	193700040	AMM - Inorganic Materials Science (Koster)	5.0	IMS, XUV	
	201700025	Solar Energy (Reinders)	5.0	IMS	
2B	201500167	MTCMP (van Houselt)	5.0	PIN	
	193570040	Theory of General Relativity (v. Damme)			CCP
	200900066	Intr. to the Physics of Corr. El. (Golubov)	5.0		CCP, CMS, ICE, PIN, QTM, IMS
	201500405	Theory of Complex Functions (Jeurnink)	3.0		COPS, CMS, LPNO, OS, PoF
-	193510020	Electronic Structure Theory 1 (Kelly)[5)]	5.0	CMS	

Physics of Fluids

Quartile	Code	Course	EC	SC[1)]	RC[1)]
1A	193570010	Advanced Fluid Mechanics (Huisman)	5.0	PoF	EMS, PCF
	191560430	Nonlinear Dynamics (Meijer)	5.0		PoF
1B	193580010	Turbulence (Lohse)	5.0	PoF	
	193572010	Physics of Bubbles (Versluis)	2.5	PoF	
2A	193580020	Experimental Techniques in PoF (Marin)	5.0	PoF	EMS
	201400194	Granular Matter (v.d. Meer)	5.0	PoF	
	193542070	Medical Acoustics (Versluis)	5.0	BMPI, PoF	
2B	201400195	Fluids and Elasticity (Snoeijer)	2.5	PoF	
	193565000	Capillarity Phenomena (Mugele)	5.0	PCF, PoF	BE
	201800131	Numerical Meth. for Engineers (Lammertink)	5.0		PoF
	191154731	Computational Fluid Dynamics (Venner)	5.0		PoF
	201500405	Theory of Complex Functions (Jeurnink)	3.0		COPS, CMS, LPNO, OS, PoF

Soft Matter

Quartile	Code	Course	EC	SC[1)]	RC[1)]
1A	202001414	Physical Biology (Claessens/Kocer)	5.0	NBP	
	201700187	Soft and Biological Techniques (Duits)[2)]	5.0		BE, NBP, PCF
	201800083	Advanced Colloids and Interfaces (Wood)	5.0		BE, PCF
	193640020	Biophysical Techn. and Mol. Imaging (Otto)	5.0	NBP	BMPI
	193400131	Nano-Optics (Garcia-Blanco)	5.0		NBP, OS
2A	193400121	Nano-Fluidics (Siretanu)	5.0	BE, PCF	PoF
	202001413	Soft Matter Physics (Lemay)	5.0	BE, PCF	CCP, NBP, PoF
	193542070	Medical Acoustics (Versluis)	5.0	BMPI, PoF	
	201300141	Wave Optics (vd Slot)	5.0	AQO, BMPI, COPS, LPNO, OS	NBP, XUV
	193400111	Bionanotechnology (Bennink)	5.0		NBP
	191210910	Image Processing and Computer Vision (Abayazid)	5.0		BMPI
2B	193565000	Capillarity Phenomena (Mugele)	5.0	PCF, PoF	BE
	193500000	Biomedical Optics (Vellekoop)	5.0	BMPI	
	201800114	Imaging Technology in Radiology (Simonis)	5.0		BMPI
	201400196	Quantum Emitters (Vos)	5.0		COPS, NBP
	201500405	Theory of Complex Functions (Jeurnink)	3.0		COPS, CMS, LPNO, OS, PoF
	201100254	Adv. Comp. Vision and Pattern Recognition (Spreeuwers)	5.0		BMPI
	201500583	Machine Learning for Medical Applications (Van der Heijden)	1.5		BMPI
-	201300137	Ions and Devices (Lemay)	5.0	BE	

A Capita Selecta course is used for activities done in the chair, not belonging to regular courses. The content, form and size is in consultation with the chair. There is a Grade form CS courses AP to register course code, name, ECs, subject, material used, assessment and a title.

[1)] SC is Specialization courses, RC is Recommended courses, see also Curriculum AP.
[2)] Soft and Biological Techniques requires previous knowledge, depending on your specific background. In addition, there is a maximum number of students that can participate. There is a maximum of student places. Please contact the teaching staff.
[3)] Students who want to participate in this course, please contact the teaching staff.
[4)] Part of AT Module 09 Condensed Matter Physics (201800130)
[5)] Electronic structure 1 and 2 can be done independently. Electronic Structure Theory 1 is no preknowledge for Electronic Structure Theory 2.