

Nanotechnology and Materials Science Specialization (Responsible: Szabolcs Csonka)

Type: C - compulsory, E - elective modules, O - optional

- Proposed semester, *proposed semester of elective courses, @-alternative semester

" - Proposed semester for courses running biannually, check the semesters remark (even / odd sp

Subject				Type	Eval	Credit	Hours			Semester (spring start)				Semester (fall start)				Semester course active	
							Lect	Prac	Lab	1	2	3	4	1	2	3	4		
GENERAL CURRICULUM																			
CRITERION COURSES						0													
Basic Physics Knowledge						C	a	0	0	0	0								every semester
Internship NM						C	a	0	0	0	0		#		#			#	every fall
CORE SUBJECTS						13													
Artificial Intelligence in Physics						C	e	5	1	0	2		#			#			every fall
Physics Laboratory NM						C	c	6	0	0	4		#			#			every fall
Colloquium Series 1						C	c	1	1	0	0		#				#	every semester	
Colloquium Series 2						C	c	1	1	0	0			#				#	every semester
MANAGEMENT AND COMMUNICATION (one course from the list below)						E	e	3	2	0	0	0	0	3	0	0	3	0	0
Innovation and Green Finance						E	e	3	2	0	0		*		*		*	every semester	
English for University Studies B2+						E	e	3	0	2	0		*		*		*	every spring	
Public Speaking B2+						E	e	3	0	2	0		*		*		*	every spring	
Academic Writing C1						E	e	3	0	2	0		*		*		*	every spring	
Professional Speaking C1						E	e	3	0	2	0		*		*		*	every spring	
Discussing Engineering C1						E	e	3	0	2	0		*		*		*	every spring	
CORE ELECTIVE PHYSICS COURSE (3 courses from the list below)						E	e	15				10	5	0	0	5	5	5	0
Statistical Physics						E	e	5	2	1	0		*		*		*	every fall	
Particle Physics						E	e	5	2	1	0		*		*		*	every fall	
Nuclear Physics						E	e	5	2	1	0	*	*		*		*	every spring	
Quantum Physics of Atoms						E	e	5	2	1	0	*	*		*		*	every spring	
Nanophysics						E	e	5	2	1	0	*	*		*		*	every spring	
Nanotechnology and Materials Science						E	e	5	3	0	0	*		*		*	every fall		
Fundamentals of Photonics						E	e	5	2	1	0	*		*		*	every fall		
Computer Simulations in Physics						E	e	5	2	0	1	*	*		*		*	every spring	
DIPLOMA WORK																			
Diploma Work NM1						C	c	10	0	0	7				#			#	every semester
Diploma Work NM2						C	c	20	0	0	10				#			#	every semester
OPTIONAL COURSES (any BME course)						O		6				0	0	6	0	0	0	6	0
NANOTECHNOLOGY AND MATERIALS SCIENCE SPECIALIZATION																			
COMPULSORY FROM THE CORE PHYSICS COURSE BLOCK																			
Nanophysics						C	e	5	2	1	0	*			*		*	every spring	
Nanotechnology and Materials Science						E	e	5	3	0	0	*			*		*	every fall	
COMPULSORY SPECIALISATION COURSES						C		9											
Seminar NM1						C	c	2	0	2	0	#				#		every semester	
Seminar NM2						C	c	2	0	2	0		#				#	every semester	
Project Laboratory NM1						C	c	7	0	0	5		#				#	every semester	
Project Laboratory NM2						C	c	13	0	0	8		#		#		#	every semester	
Semiconductor Physics						C	e	3	2	0	0		#				#	every spring	
ELECTIVE SPECIALIZATION COURSES (30 credits from the list below)						E		23				15	4	7	0	12	11	3	0
Elective Project Laboratory NM						E	c	10	0	0	7	*	*	*		*	*	*	every semester
Emerging Devices and Architectures for Information Technologies						E	e	3	2	0	0	*		*		*	*	*	every spring
Physics of Advanced Semiconductor Devices						E	e	3	2	0	0	*		*		*	*	*	every spring
Modern Solid State Physics						E	e	7	3	2	0	*		*		*	*	*	every spring
Computational Simulation at Atomic Scale in Solids						E	c	3	1	0	1		*		*	*	*	*	every fall
Surface Physics						E	c	3	2	0	0	*		*	*	*	*	*	every fall
Optical Spectroscopy in Materials Science						E	e	5	3	0	0	*		*		*	*	*	every spring
Introduction to Data Science						E	e	7	3	1	1	*		*		*	*	*	every spring
Artificial Intelligence in Data Science						E	c	5	1	0	2		*		*	*	*	*	every fall
Data Science Aided Measurements						E	c	3	0	0	2	*		*	*	*	*	*	every spring
The Fundamentals and Applications of Finite Element Modeling						E	c	3	2	0	0	*		*	*	*	*	*	every spring
Nanotechnology and Materials Science Laboratory						E	c	3	0	0	2	*		@	*	*	@	@	every semester
Group theory in Solid State Physics						E	e	3	2	0	0	*		*	*	*	*	*	every spring
Theoretical Nanophysics						E	e	5	2	1	0	"		"		"		"	odd spring
Quantum Computing Architectures						E	e	3	2	0	0	*		*	*	*	*	*	every fall
Chemical Methods in Nanotechnology						E	e	3	2	0	0	*		*	*	*	*	*	every fall
Theory of Magnetism						E	e	5	2	1	0	*		*	*	*	*	*	every spring
Superconductivity						E	e	3	2	0	0	*		*	*	*	*	*	every fall
Topological Insulators						E	e	3	2	0	0	"		"	"	"	"	"	odd fall
Transport in Complex Nanostructures						E	e	5	3	0	0	*		*	*	*	*	*	odd spring
Measurement Control Project Work in LabVIEW Environment						E	c	3	0	0	2	*		*	*	*	*	*	every fall
Semiconductor Metrology						E	e	3	2	0	0	*		*		*	*	*	every spring
Real-Time Control and Monitoring of Experimental Systems Using LabVIEW FPGA						E	c	4	0	0	3	*		*		*	*	*	every spring
6 credits can be taken from another specialisation without request																			
RECOMMENDED OPTIONAL COURSES						O													
Trends in material science						E	c	2	2	0	0	"		"		"		"	even spring
Electronic Structure of Solid Matter						E	e	5	2	1	0	"		"	"	"	"	"	odd fall
The Physics of One-Dimensional Systems						E	e	3	2	0	0	"		"	"	"	"	"	even fall
Quantum Information Processing						E	e	3	2	0	0	"		"	"	"	"	"	every spring
Physics of Disordered Systems						O	e	4	2	1	0	"		"	"	"	"	"	odd fall
Condensed Matter Field Theory						E	e	6	3	1	0	E		O		O		E	even spring
TOTAL NUMBER OF CREDITS											30	30	30	30	30	30	30	30	30