

CURRICULUM

Master study program	FIZICA MATERIALELOR AVANSATE ȘI NANOSTRUCTURI/PHYSICS OF ADVANCED MATERIALS AND NANOSTRUCTURES
Academic field	PHYSICS
Faculty	FACULTY OF PHYSICS
Duration	2 years (4 semesters)
Type of study full-time(IF)/ part-time (IFR)/ distance-learning (ID)	full-time (IF)

1. STRUCTURE OF ACADEMIC YEAR

Number of semesters: 2/year (4/program)

Number of ECTS: 30/semester

Number of face-to-face activities/week: 22-24

Structure of academic year (in weeks):

	Face-to-face learning		Exam session			Research internship	Holidays		
	1-st sem.	II-nd sem.	Winter	Summer	Re-exam		Winter	Spring	Summer
1-st year	14	14	3	4	3	0	3	1	9
II-nd year	14	10+4	3	3	2	0	3	1	

2. FLEXIBILITY OF STUDY ROUTE

Flexible study routes are insured by elective and optional courses/disciplines. Elective disciplines are proposed in each year. In the case of optional (facultative) courses, corresponding supplementary credits (ECTS) are added to the academic record (diploma supplement). Credits for optional courses are obtained after passing a form of examination, as defined in the course information sheet. Credits corresponding to optional courses cannot substitute for credits corresponding to compulsory courses.

3. STUDY PROGRESS REQUIREMENTS

Requirements for passing a year of study are defined in the *Rules and Regulations regarding professional activity of students* adopted by the Senate of the University of Bucharest.

4. FINAL EXAM

Finalization of master thesis: 4-th semester

Master's thesis defense session: june, after 4-th semester

Number of credits for final exam: 10 credits (for defending master thesis) in addition to compulsory 120 credits.

5. SYLLABUS

UNIVERSITY OF BUCHAREST, FACULTY OF PHYSICS

Field of study: PHYSICS

MASTER PROGRAM: PHYSICS OF ADVANCED MATERIALS AND NANOSTRUCTURES

Accredited: 2013 / Revised: 2019

Applies beginning with: autumn 2020

Type of study: full-time

Duration of study: 4 semesters/120 ECTS

SYLLABUS

Academic year 2020-2021

1-st year

C = course; L = laboratory; T = tutorial; P = research project; E = exam; CL = colloquium; A = assessment; ECTS = number of credits; DI.xxx = compulsory course; DO.xxx = elective course, DFC.xxx = optional/facultative course; DA = knowledge-deepening course; DS = course of advanced knowledge in the field of study program; SI = number of hours of individual study

Crt. no.	Code	Course	1-st semester						2-nd semester						Type	SI
			C	S	L	P	A	ECTS	C	S	L	P	A	ECTS		
1	DI.101	Quantum statistical physics	2	2	0	0	E	6	-	-	-	-	-	-	DA	90
2	DI.102	Condensed state physics	2	2	0	0	E	6	-	-	-	-	-	-	DS	90
3	DI.103	Group theory and application to physics	2	2	0	0	E	6	-	-	-	-	-	-	DA	90
4	DI.104	Experimental methods in physics	2	0	3	0	E	6	-	-	-	-	-	-	DA	76
5	DI.105	Ethics and academic integrity	1	0	0	0	CL	3	-	-	-	-	-	-	DS	57
6	DI.106	Research activity (traineeship)	0	0	0	4	V	3	-	-	-	-	-	-	DA	15
7	DI.107	Materials characterization techniques	-	-	-	-	-	-	2	0	2	0	E	6	DS	90
8	DI.108	Magnetism. Spintronics	-	-	-	-	-	-	2	1	1	0	E	5	DA	65
9	DI.109	Organic semiconductors and applications	-	-	-	-	-	-	2	0	2	0	E	6	DS	90
10	DI.110	Preparation methods for nanomaterials and nanostructures	-	-	-	-	-	-	2	0	2	0	E	5	DA	65
11	DO.111.1	Physics of mesoscopic systems	-	-	-	-	-	-	2	2	0	0	E	5	DS	65
	DO.111.2	Transport phenomena in disordered materials														
	DO.111.3	Linear response theory														
12	DI.112	Research activity (traineeship)	-	-	-	-	-	-	0	0	0	4	V	3	DA	15
		Total	9	6	3	4		30	10	3	7	4		30		
13	DFC.113	Phase transitions in condensed matter	-	-	-	-	-	-	2	2	0	0	E	4	DA	40
14	DFC.114	Interaction of laser radiation with matter	-	-	-	-	-	-	2	2	0	0	E	4	DA	40

Academic year 2021-2022

2-nd year

C = course; L = laboratory; T = tutorial; P = research project; E = exam; CL = colloquium; A = assessment; ECTS = number of credits; DI.xxx = compulsory course; DO.xxx = elective course, DFC.xxx = optional/facultative course; DA = knowledge-deepening course; DS = course of advanced knowledge in the field of study program; SI = number of hours of individual study

Crt. no.	Code	Course	1-st semester						2-nd semester						Type	SI
			C	S	L	P	A	EC TS	C	S	L	P	A	EC TS		
1	DO.201.1	Nonlinear optics	2	0	2	0	E	6	-	-	-	-	-	-	DS	90
	DO.201.2	Physics of dielectric materials														
2	DO.202.1	Computational methods for electronic structure of materials	2	2	0	0	E	6	-	-	-	-	-	-	DA	90
	DO.202.2	Advanced methods in statistical physics														
3	DI.203	Nanostructures for electronics and optoelectronics	2	0	2	0	E	6	-	-	-	-	-	-	DA	90
4	DO.204.1	Physics of semiconductor devices	2	0	2	0	E	6	-	-	-	-	-	-	DA	90
	DO.204.2	Electrical and optical characterization of semiconductors														
5	DI.205	Research activity (traineeship)	0	0	0	6	V	6	-	-	-	-	-	-	DA	62
6	DI.206	Physics of liquid crystals and polymeric materials	-	-	-	-	-	-	2	0	2	0	E	5	DA	81
7	DO.207.1	Special electronic and optoelectronic devices	-	-	-	-	-	-	2	0	2	0	E	5	DS	81
	DO.207.2	Physics and technology of thin films														
8	DI.208	Research activity (traineeship)	-	-	-	-	-	-	0	0	0	18	V	15	DA	191
9	DI.209	Finalization of master thesis	-	-	-	-	-	-	0	0	0	0	V	5	DA	121
Total			8	2	6	6		30	4	0	4	18		30		
Defense of master thesis			-	-	-	-	-	-	-	-	-	-	-	10		
10	DFC.210	Computational methods in condensed matter	2	2	0	0	E	3	-	-	-	-	-	-	DA	15
11	DFC.211	Virtual instrumentation and data acquisition	2	0	2	0	E	3	-	-	-	-	-	-	DA	15