Curriculum for BSc in Physics starting from September 2018 and beyond

Legend:

Course type: O - obligatory, OP - optional (a given number of credits must be completed), E - elective, C - criteria.

Requirement: e - exam, m - mid-term mark, s - signature, c - comprehensive exam.

The notation for the hours/credits (e.g. 4/2/0/e/7) has the following structure: the first three numbers give the hours of lectures/practices/laboratories per week, the letter is the course requirement, and the last number is the ETCS credit score for the course.

	Subject, Code, Type			Semester						Hours/Credit
				1	2	3	4	5	6	
Core Subjects			**171**							
1	Mathematical Methods in Physics 1	BMETE92AF51	O	7						4/2/0/e/7
2	Mathematical Methods in Physics 2	BMETE15AF52	O		7					4/2/0/e/7
3	Modern Mathematical Methods in Physics	BMETE15AF53	O			5				2/2/0/m/5
4	Programming	BMEVIEEA024	O	4						2/0/2/m/4
5	Programming 2	BMEVIEEA026	O		4					2/0/2/m/4
	Economy and Communication Skills*							4		
6	Management and Business Economics	BMEGT20A003	OP							2/0/0/m/2
7	Economics	BMEGT30A002	OP							2/0/0/m/2
8	Academic English	BMEGT63MAPD	OP							0/2/0/m/2
9	Communication Skills	BMEGT63A061	OP							0/2/0/m/2
10	English for Engineering	BMEGT63A051	OP							0/2/0/m/2
11	English for Specific Purposes	BMEGT63MAS9	OP							0/2/0/m/2
	**: From this list a total of 4 credits of subjects must be completed.*									
12	Experimental Physics 1	BMETE11AF42	O	5						4/0/0/e/5
13	Practical Course in Experimental Physics 1	BMETE11AF43	O	3						0/2/0/m/3
14	Experimental Physics 2	BMETE12AF46	O		5					4/0/0/e/5
15	Practical Course in Experimental Physics 2	BMETE12AF47	O		3					0/2/0/m/3
16	Experimental Physics 3	BMETE11AF46	O			5				2/2/0/e/5
17	Experimental Nuclear Physics	BMETE80AF43	O				3			2/1/0/m/3

18	Introductory Laboratory Exercises	BMETE11AF44	O	3						0/0/2/m/3
19	Laboratory Exercises in Physics 1	BMETE11AF28	O		4					0/0/3/m/4
20	Laboratory Exercises in Physics 2	BMETE11AF45	O			5				0/0/3/m/5
21	Calculus for Physicists	BMETE93AF20	O	7						4/2/0/e/7
22	Multivariable Calculus for Physicists	BMETE93AF21	O		5					2/2/0/e/5
23	Probability Theory for Physicists	BMETE95AF00	O			4				2/2/0/e/4
23	Numerical Methods for Physicists	BMETE92AF01	O		2					0/0/2/m/2
24	Measurement Techniques	BMETE11AF30	O			2				2/0/0/e/2
25	Electronics	BMETE12AF27	O			2				2/0/0/m/2
26	Electronics Laboratory	BMETE80AF03	O				2			0/0/2/m/2
27	Mechanics 1	BMETE15AF23	O			2				2/0/0/e/2
28	Practical Course in Mechanics 1	BMETE15AF24	O			3				0/2/0/m/3
29	Quantum Mechanics 1	BMETE15AF49	O				3			3/0/0/e/3
30	Practical Course in Quantum Mechanics 1	BMETE15AF28	O				3			0/2/0/m/3
31	Electrodynamics 1	BMETE15AF25	O					2		2/0/0/e/2
32	Practical Course in Electrodynamics 1	BMETE15AF26	O					3		0/2/0/m/3
33	Optics	BMETE12AF35	O					4		2/2/0/e/4
34	Introduction to Solid State Physics	BMETE11AF05	O					2		2/0/0/e/2
35	Practical Course in Solid State Physics	BMETE11AF06	O					2		0/2/0/m/2
36	Statistical Physics 1	BMETE15AF29	O						2	2/0/0/e/2
37	Practical Course in Statistical Physics 1	BMETE15AF30	O						3	0/2/0/m/3
38	Specialization Subjects (see the program of the physics and applied physics specializations bellow)		O/O P				16	13	12	
39	Thesis Work	BMETE15AF11	O						10	0/0/10/m/10
Elective Courses			**9**							
40	Elective courses		E			2	4		3	
	Total Credits:			**29**	**30**	**30**	**31**	**30**	**30**	**180**
	Contact Hours**			**24**	**25**	**26**	**24**	**25**	**16**	
	Exams**			**3**	**3**	**4**	**3**	**4**	**2**	

*** Estimated value with typical choice.*

Criterion Courses

40	Preliminary Test in Mathematics	BMETE15AF50	C	0						0/0/0/s/0
41	Preliminary Test in Physics	BMETE11AF50	C	0						0/0/0/s/0
42	Comprehensive Examination in Experimental Physics	BMETE13AF11	C				0			0/0/0/c/0
43	Sport		C		0	0				0/2/0/s/0
Language Learning										
44	Foreign Language		E	0	0	0	0	0		0/4/0/s/0
Elective Courses Related to Training										
45	Basic Calculus	BMETE15AF51	E	3						0/3/0/m/3
46	Solving Problems in Physics 1	BMETE11AF47	E	3						0/3/0/m/3
47	Solving Problems in Physics 2	BMETE12AF44	E		2					0/2/0/m/2
48	Solving Problems in Physics 3	BMETE11AF48	E			2				0/2/0/m/2
49	Advanced Problem Solving Seminar 1	BMETE11AF49	E	3						0/2/0/m/3
50	Advanced Problem Solving Seminar 2	BMETE12AF45	E		3					0/2/0/m/3
51	Research Project	BMETE11AF51	E	3	3	3	3	3	3	0/2/0/m/3

Physicist Specialization

	Subject, Code, Type			1	2	3	4	5	6	
52	Advanced Laboratory Exercises in Physics 1	BMETE11AF32	O				5			0/0/4/m/5
53	Advanced Laboratory Exercises in Physics 2	BMETE11AF33	O					5		0/0/4/m/5
54	Chemistry	BMEVEFKA146	O				2			2/0/0/e/2
	Advanced Solid State Physics: Chosable from these two subjects		O						2	
55	Theoretical Solid State Physics	BMETE11AF34	OP							2/0/0/e/2
56	Applied Solid State Physics	BMETE11AF11	OP							2/0/0/e/2
57	Seminar	BMETE15AF40	O						2	0/2/0/m/2
58	Optional Courses		OP				**9**	**8**	**8**	
Optional Courses										
59	Mechanics 2	BMETE15AF32	OP				2			2/0/0/e/2
60	Practical Course in Mechanics 2	BMETE15AF44	OP				3			0/2/0/m/3
61	Quantum Mechanics 2	BMETE15AF36	OP					2		2/0/0/e/2
62	Practical Course in Quantum Mechanics 2	BMETE15AF43	OP					3		0/2/0/m/3
63	Electrodynamics 2	BMETE15AF48	OP						5	2/2/0/m/5
64	Group Theory for Physicists	BMETE11AF40	OP					5		2/2/0/e/5
65	Theory of Relativity	BMETE15AF46	OP						3	2/0/0/m/3
66	Classical and Quantum Chaos	BMETE15AF45	OP					3		2/0/0/e/3
67	Physical Chemistry	BMEVEFKA147	OP					3		2/0/0/e/3
68	Fluid Mechanics	BMEGEÁTAF11	OP				3			2/0/0/m/3
69	Introduction to Experimental Data Handling	BMETE80AF38	OP				3			2/0/0/e/3
70	Computer Solution of Technical and Physical Problems	BMETE11AF41	OP					3		0/0/2/m/3
71	Computer Controlled Measurements	BMETE11AF38	OP				3			0/0/2/m/3
72	Measurement Control Project Work in LabVIEW Environment	BMETE11AF39	OP					3		0/0/2/m/3
73	Advanced Laboratory Exercises in Physics 3	BMETE12AF21	OP						5	0/0/4/m/5
74	*Quantum Information Processing*[#]	*BMETE11MF42*	*OP*						*3*	*2/0/0/e/3*
75	Scientific Programming	BMETE15AF54	OP				4			1/0/2/m/4

#: Subject of MSc training, it can be chosen in BSc.

Applied Physics Specialization

	Subject, Code, Type			1	2	3	4	5	6	
76	Advanced Laboratory Exercises in Physics 1	BMETE11AF32	O				5			0/0/4/m/5
77	Advanced Laboratory Exercises in Physics 2	BMETE11AF33	O					5		0/0/4/m/5
78	Advanced Laboratory Exercises in Physics 3	BMETE12AF21	O						5	0/0/4/m/5
	Advanced Solid State Physics: Chosable from these two subjects		O						2	
79	Theoretical Solid State Physics	BMETE11AF34	OP							2/0/0/e/2
80	Applied Solid State Physics	BMETE11AF11	OP							2/0/0/e/2
81	Introduction to Experimental Data Handling	BMETE80AF38	O				3			2/0/0/e/3
82	Chemistry	BMEVEFKA146	O				2			2/0/0/e/2
83	Optional Courses		OP				**6**	**8**	**5**	

Optional Courses

Materials Science

84	Spectroscopy	BMETE12AF48	OP					3		2/0/0/e/3
85	*Advanced Semiconductor Devices* [#]	*BMETE11MF52*	*OP*						*3*	*2/0/0/e/3*
86	Microtechnology and Nanotechnology	BMETE12AF33	OP						3	2/0/0/m/3
87	Physics of Vacuum	BMETE12AF43	OP					3		2/0/0/m/3
88	Fundaments and Applications of Materials Science	BMETE12AF31	OP					3		2/0/0/e/3
89	Introduction to Surface Physics	BMETE12AF32	OP					3		2/0/0/m/3
90	Physical Chemistry	BMEVEFKA147	OP					3		2/0/0/e/3

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Theoretical Physics

91	Quantum Mechanics 2	BMETE15AF36	OP					2		2/0/0/e/2
92	Practical Course in Quantum Mechanics 2	BMETE15AF43	OP					3		0/2/0/m/3
93	Electrodynamics 2	BMETE15AF48	OP						5	2/2/0/m/5
94	Fluid Mechanics	BMEGEÁTAF11	OP				3			2/0/0/m/3

Informatics-Physics

95	Computer Controlled Measurements	BMETE11AF38	OP				3			0/0/2/m/3
96	Measurement Control Project Work in LabVIEW Environment	BMETE11AF39	OP					3		0/0/2/m/3

97	Scientific Programming	BMETE15AF54	OP				4			1/0/2/m/4
98	Monte Carlo Methods	BMETE80AF45	OP					4		2/1/0/e/4
99	The Fundaments and Applications of Finite Element Modeling	BMETE12AF42	OP				3			2/0/0/m/3
100	*Quantum Information Processing*[#]	*BMETE11MF42*	*OP*						*3*	*2/0/0/e/3*

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Nuclear Technology

101	Nuclear Measurement Techniques	BMETE80AF42	OP				3			2/0/0/e/3
102	Sustainable Development and Energetics	BMETE80AF06	OP				3			2/0/0/m/3
103	Environmental Protection	BMETE80AF29	OP				3			2/0/0/e/3
104	Thermo-hydraulics of Nuclear Power Plants	BMETE80AF31	OP					5		3/1/0/m/5
105	Introduction to CFD Methods	BMETE80AF37	OP						4	1/0/2/m/4
106	Reactor Physics	BMETE80AF33	OP					5		3/1/0/e/5
107	Introduction to Fusion Plasma Physics	BMETE80AF36	OP					3		2/0/0/e/3
108	Nuclear Safety	BMETE80AF30	OP					3		2/0/0/m/3
109	Introduction to Geophysics	BMETE80AF34	OP					3		2/0/0/e/3
110	Radiochemistry and Nuclear Chemistry	BMETE80AF32	OP						4	3/0/0/m/4

Optics and Laser Physics

111	Laser Technique	BMETE12AF37	OP					3		2/0/0/m/3
112	Planning and Construction of Physical Experiments	BMETE12AF41	OP						3	2/0/0/m/3
113	Microscopy	BMETE12AF34	OP						3	2/0/0/m/3
114	Introduction to the Physics of Ultrafast Pulses	BMETE12AF40	OP						3	2/0/0/m/3

Medical and Biophysics

115	Medical Imaging Systems	BMETE80AF35	OP						3	2/0/0/m/3
116	Foundations of Biophysics	BMETE12AF38	OP				3			2/0/0/m/3
117	Chemical and Biomedical Measurement Techniques	BMETE14AF07	OP				5			2/0/2/m/5

Elective Courses

	Applied Plasma Physics	BMETE12AF39	E						3	2/0/0/m/3
	Selected topics in the modern technologies	BMETE12AF14	E						2	2/0/0/m/2