

* **Physics** (*Dated September 30th, 2015*)

Total credits of the curriculum: **139 credits**

- **General education knowledge:**

(not including physical education, military defense education, and soft skills) **28 credits**

- **Basic courses:** **6 credits**

- **Fundamental courses:** **15 credits**

- **Core courses:** **27 credits**

- **Advanced courses:** **63 credits**

+ *Required:* *51 credits*

+ *Elective:* *15 credits*

+ *Undergraduate thesis:* *7 credits*

Available curriculum

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
I		General education knowledge <i>(Not including subjects 10-12)</i>	28				
1	PHI1004	<i>Fundamental Principles of Marxism - Leninism 1</i>	2	24	6		
2	PHI1005	<i>Fundamental Principles of Marxism - Leninism 2</i>	3	36	9		PHI1004
3	POL1001	<i>Ho Chi Minh Ideology</i>	2	20	10		PHI1005
4	HIS1002	<i>The Revolutionary Line of the Communist Party of Vietnam</i>	3	42	3		POL1001
5	INT1003	<i>Introduction to Informatics 1</i>	2	10	20		
6	INT1005	<i>Introduction to Informatics 3</i>	2	12	18		INT1003
7	FLF2101	<i>General English 1</i>	4	16	40	4	
8	FLF2102	<i>General English 2</i>	5	20	50	5	FLF2101
9	FLF2103	<i>General English 3</i>	5	20	50	5	FLF2102
10		<i>Physical Education</i>	4				
11		<i>National Defense Education</i>	8				
12		<i>Soft Skills</i>	3				
II		Basic courses	6				
13	HIS1056	<i>Fundamentals of Vietnamese Culture</i>	3	42	3		
14	GEO1050	<i>Earth and Life Sciences</i>	3	30	10	5	
III		Fundamental courses	15				
15	PHY1106	<i>Linear Algebra</i>	3	30	15		
16	PHY1107	<i>Calculus 1</i>	3	30	15		
17	PHY1108	<i>Calculus 2</i>	3	30	15		PHY1107
18	PHY1109	<i>Probability and Statistics</i>	3	30	15		PHY1107
19	CHE1080	<i>General Chemistry</i>	3	42		3	
IV		Core course	27				
20	PHY2201	<i>Mathematics in Physics 1</i>	3	30	15		PHY1106

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
							PHY1108
21	PHY2301	<i>Mechanics</i>	4	45	15		
22	PHY2302	<i>Thermodynamics and Molecular physics</i>	3	30	15		PHY1107 PHY2301
23	PHY2303	<i>Electricity and Magnetism</i>	4	45	15		PHY1108
24	PHY2304	<i>Optics</i>	3	32	12	1	PHY2303
25	PHY2307	<i>General Physics Practice 1</i>	2		30		PHY2301
26	PHY2308	<i>General Physics Practice 2</i>	2		30		PHY2307
27	PHY2309	<i>General Physics Practice 3</i>	2		30		PHY2308
28	PHY2004	<i>Nuclear Physics</i>	2	30			PHY2301
29	PHY2064	<i>Atomic Physics</i>	2	22	8		PHY2304
V		Advanced courses	63				
V.1		<i>Required</i>	<i>41</i>				
30	PHY3301	<i>Theoretical mechanics</i>	3	30	15		PHY1108 PHY2301
31	PHY3606	<i>Electrodynamics</i>	4	45	15		PHY2304
32	PHY2306	<i>Quantum Mechanics</i>	4	45	15		PHY2304
33	PHY3608	<i>Statistical Physics</i>	4	45	15		PHY3301 PHY3606
34	PHY3609	<i>Analog Electronics</i>	3	30	15		PHY2303
35	PHY3610	<i>Digital Electronics</i>	3	30	15		PHY3609
36	PHY3502	<i>Computational Physics 1</i>	3	30	15		INT1005 PHY1106 PHY1108
37	PHY3503	<i>Academic English for physics students</i>	2	30			FLF2101
38	PHY3163	<i>Mathematics in Physics 2</i>	3	30	15		PHY2201
39	PHY3506	<i>Experimental methods in Modern Physics</i>	2	25	5		PHY2308
40	PHY3507	<i>Modern Physics Laboratory</i>	2	10	20		PHY3506
41	PHY3508	<i>Computational Physics 2</i>	3	30	15		PHY3502
42	PHY3510	<i>Introduction to Astronomy</i>	3	30	15		PHY2304
43	PHY4073	<i>Seminar in Research Topics</i>	2	3	27		

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
V.2		<i>Elective</i>	15/ 197				
44	PHY3514	<i>Introduction to Quantum Field Theory</i>	3	35	10		PHY2306
45	PHY3337	<i>Low dimensional physics</i>	3	35	10		PHY2306 PHY3608
46	PHY3357	<i>Laboratory in Theoretical Physics</i>	3		45		PHY2306 PHY3608
47	PHY3513	<i>Group theory</i>	3	30	10	5	PHY1106 PHY1108
48	PHY3338	<i>Practice Theory</i>	3	35	10		PHY2306
49	PHY3524	<i>Introduction to General Relativity</i>	3	35	10		PHY2306
50	PHY3333	<i>Quantum Statistical physics</i>	3	30	15		PHY2306 PHY3608
51	PHY3334	<i>Solid State Theory</i>	3	35	10		PHY2306 PHY3608
52	PHY3528	<i>Introduction to Quantum Field Theory for many-body system</i>	3	35	10		PHY2306 PHY3608
53	PHY3530	<i>Introduction to Biophysics</i>	3	33	12		PHY2303
54	PHY3392	<i>Introduction to Physics of Soft Matter and Biophysics</i>	3	36	9		PHY2303
55	PHY3346	<i>Solid State Physics</i>	3	33	12		PHY2306
56	PHY3348	<i>Superconductivity and Magnetism</i>	3	45			PHY2306
57	PHY3347	<i>Semiconductors physics</i>	3	35	6	4	PHY2306 PHY3608
58	PHY3355	<i>Laboratory in Solid State Physics</i>	3		45		PHY3346
59	PHY3351	<i>Semiconductor Device Physics</i>	3	35	5	5	PHY3347
60	PHY3707	<i>Magnetic measurements</i>	3	40		5	PHY2303
61	PHY3713	<i>Opto-electronics</i>	3	45			PHY2304
62	PHY3353	<i>Opto-Semiconductors</i>	3	40	5		PHY3346 PHY3347
63	PHY3517	<i>Theory of digital signal processing</i>	3	30	15		PHY3610
64	PHY3512	<i>Pulse and Digital Modulation</i>	3	30	15		PHY3610
65	PHY3375	<i>Laboratory in Modern Electronics</i>	3		45		PHY3512 PHY3517
66	PHY3521	<i>Theory of digital communication</i>	3	45			PHY3610
67	PHY3522	<i>Microcontrollers</i>	3	15	30		PHY3610
68	PHY3523	<i>Applied electronics for measurement</i>	3	15	30		PHY3610
69	PHY3423	<i>Principles and Applications of</i>	3	30	15		PHY3610

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
		<i>Ultrasound</i>					
70	PHY3424	<i>Principles and Applications of Digital Communication Techniques</i>	3	30	15		PHY3610
71	PHY3379	<i>Computer and Interfacing</i>	3	30	10	5	INT1005 PHY3610
72	PHY3414	<i>Physics of Oscillation</i>	3	45			PHY3606 PHY3163
73	PHY3329	<i>Laser Physics and Applications</i>	3	42	0	3	PHY2304
74	PHY3356	<i>Laboratory in Quantum Optics</i>	3	10	30	5	PHY2304
75	PHY3390	<i>Molecular Spectroscopy</i>	3	45			PHY2306
76	PHY3388	<i>Atomic Spectroscopy</i>	3	42		3	PHY2306 PHY3606
77	PHY3391	<i>The basic of Experimental Spectroscopy</i>	3	40	3	2	PHY2306
78	PHY3401	<i>Optical communication</i>	3	35	10		PHY2304
79	PHY3419	<i>Physics of the Earth</i>	3	30	10	5	PHY2304
80	PHY3515	<i>Seismology</i>	3	30	10	5	PHY2304 INT1005
81	PHY3359	<i>Laboratory in Physics of the Earth</i>	3	10	30	5	PHY3419
82	PHY3526	<i>Potential methods applied in Geophysics</i>	3	30	10	5	PHY2304
83	PHY3404	<i>Geoelectrical Methods</i>	3	30	10	5	PHY2304 PHY3163
84	PHY3405	<i>Geomagnetical Methods</i>	3	30	10	5	PHY2303
85	PHY3406	<i>Radioactive and Nuclear Geophysics</i>	3	30	10	5	PHY2304
86	PHY3407	<i>Logging Geophysics</i>	3	30	10	5	PHY2304
87	PHY3408	<i>Geology for Geophysicists</i>	3	30	10	5	PHY2304
88	PHY3432	<i>Simulation of Physics Problems</i>	3	30	10	5	PHY3502
89	PHY3313	<i>Advanced Programming</i>	3	30	15		INT1005
90	PHY3376	<i>Laboratory in Computational Physics and Applied Informatics</i>	3	10	30	5	INT1005

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
91	PHY3335	<i>Embedded Systems</i>	3	30	15		INT1005 PHY3610
92	PHY3336	<i>Programming for Mobile and Web</i>	3	30	15		INT1005
93	PHY3380	<i>Parallel computing</i>	3	30	15		INT1005
94	PHY3435	<i>Database Systems</i>	3	30	15		INT1005
95	PHY3377	<i>Laboratory in Computational Materials Science</i>	3	10	30	5	PHY3346
96	PHY3527	<i>Introduction to Quantum theory of Magnetism</i>	3	35	10		PHY2306
97	PHY3393	<i>Physics of solids at low temperature</i>	3	30	15		PHY2306 PHY3608
98	PHY3446	<i>Physics and low – temperature technique</i>	3	30	15		PHY3608 PHY3348
99	PHY3358	<i>Laboratory in Cryogenic Physics</i>	3	15	30		PHY3707
100	PHY3394	<i>Thermodynamics and applications</i>	3	30	15		PHY2303 PHY2306
101	PHY3448	<i>Superconductivity and applications</i>	3	30	15		PHY3608 PHY3348
102	PHY3472	<i>Standard Models and Beyond</i>	3	45			PHY3514
103	PHY3471	<i>Cosmology</i>	3	45			PHY3510
104	PHY3378	<i>Laboratory in High Energy Physics and Cosmology</i>	3	10	30	5	PHY3514 PHY3471 PHY3338
105	PHY3425	<i>Introduction to Relativity and Quantum Physics</i>	2	28		2	PHY3301
106	PHY3509	<i>Physics of Matter</i>	3	30	15		PHY2306
107	PHY3525	<i>Introduction to Particle Physics and High Energy Physics</i>	3	30	15		PHY2306
108	PHY3461	<i>Introduction to Materials Science</i>	3	40	5		PHY2306
109	PHY3462	<i>Introduction to nanotechnology</i>	3	30	15		CHE1080 PHY3346

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
V.3		<i>Undergraduate thesis/Courses replacing undergraduate thesis</i>	7				
110	PHY4050	<i>Thesis</i>	7				
		<i>Courses replacing undergraduate thesis</i>	7				
111	PHY3720	<i>Modern physics</i>	4	40	20		
112		<i>Select 1 in 3 credits among elective (in V.2 knowledge blocks) which has not learned</i>	3				
		Total	139				