

• **International Standard Program in Physics**

The International Standard Program in Physics started in 2009 with the collaboration from Brown University (U.S.A). The total minimum required number of credits is 164.

- **General education knowledge** **38 credits**
(not including physical education, military defense education, and soft skills)
- **Basic courses:** **6 credits**
- **Fundamental courses :** **15 credits**
- **Core courses:** **26 credits**
- **Advanced courses:** **79 credits**
 - + *Required:* *51 credits*
 - + *Elective:* *15/171 credits*
 - + *Supplemental:* *3/9 credits*
 - + *Undergraduate thesis:* *10 credits*

Available curriculum

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
I		General education knowledge (Not including subjects 12-14)	38				
1	PHI1004	<i>Fundamental Principles of</i>	2	24	6		

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
		<i>Marxism - Leninism 1</i>					
2	PHI1005	<i>Fundamental Principles of Marxism - Leninism 1</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	FLF2101	<i>General English 1</i>	4	16	40	4	
6	FLF2102	<i>General English 2</i>	5	20	50	5	FLF2101
7	FLF2103	<i>General English 3</i>	5	20	50	5	FLF2102
8	FLF2104	<i>General English 4</i>	5	20	50	5	FLF2103
9	FLF2105	<i>General English 5</i>	5		75		FLF2104
10	INT1003	<i>Introduction to Informatics 1</i>	2	10	20		
11	INT1005	<i>Introduction to Informatics 3</i>	2	12	18		INT1003
12		<i>Physical Education</i>	4				
13		<i>National Defence Education</i>	8				
14		<i>Soft Skills</i>	3				
II		Basic courses	6				
15	HIS1056	<i>Fundamentals of Vietnamese Culture</i>	3	42	3		
16	GEO1050	<i>Earth and Life Sciences</i>	3	30	10	5	
III		Fundamental courses	15				
17	PHY1106	<i>Linear Algebra</i>	3	30	15		
18	PHY1107	<i>Calculus 1</i>	3	30	15		
19	PHY1108	<i>Calculus 2</i>	3	30	15		PHY1107
20	PHY1109	<i>Probability and Statistics</i>	3	27	18		PHY1107
21	CHE1080	<i>General Chemistry</i>	3	42		3	
IV		Core courses	26				

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
22	PHY2300	<i>Mathematical for Physics</i>	3	30	15		PHY1108
23	PHY2301	<i>Mechanics</i>	4	45	15		
24	PHY2302	<i>Thermodynamics and Molecular physics</i>	3	30	15		PHY2301
25	PHY2303	<i>Electricity and Magnetism</i>	4	45	15		PHY3202
26	PHY2304	<i>Optics</i>	3	30	15		PHY2303
27	PHY3509	<i>Physics of Matter</i>	3	30	15		PHY2304
28	PHY2307	<i>General Physics Practice 1</i>	2		30		PHY2301
29	PHY2308	<i>General Physics Practice 2</i>	2		30		PHY2307
30	PHY2309	<i>General Physics Practice 3</i>	2		30		PHY2308
V		Advanced courses	79				
V.1		Required	51				
31	PHY4325	<i>Introduction to Relativity and Quantum Physics</i>	3	43		2	PHY2304
32	PHY3501	<i>Electrics and Electronics</i>	3	30	15		PHY2303
33	PHY3502	<i>Computational Physics 1</i>	3	30	15		INT1005 PHY1108
34	PHY3503	<i>English for Specific Purposes 1</i>	2	30			FLF2101
35	PHY3605	<i>Theoretical mechanics</i>	4	45	15		PHY2301
36	PHY3606	<i>Introduction to Electrodynamics</i>	4	45	15		PHY2303
37	PHY2306	<i>Quantum Mechanics</i>	4	45	15		PHY2304
38	PHY3608	<i>Statistical Mechanics</i>	4	45	15		PHY3605 PHY3606
39	PHY3505	<i>Methods of Mathematical Physics</i>	3	30	15		PHY2300 PHY2304
40	PHY3506	<i>Experimental methods in Modern Physics</i>	2	30			PHY2308
41	PHY3507	<i>Modern Physics Laboratory</i>	2	15	15		PHY3506

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
42	PHY3508	<i>Computational Physics 2</i>	3	30	15		PHY3502
43	PHY3510	<i>Introduction to Astronomy</i>	3	30	15		PHY2304
44	PHY3525	<i>Introduction to Nuclear and High Energy Physics</i>	3	35	10		PHY2305 PHY2306
45	PHY3346	<i>Solid State Physics</i>	3	35	10		PHY2306
46	PHY3419	<i>Physics of the Earth</i>	3	35	10		PHY2304
47	PHY4073	<i>Seminar in Research Topics</i>	2	3	27		
V.2		<i>Elective</i>	<i>15/17 1</i>				
48	PHY3329	<i>Laser Physics and Applications</i>	3	35	10		PHY2304
49	PHY3422	<i>Magnetism</i>	3	35	10		PHY2303
50	PHY3420	<i>Superconductivity</i>	3	35	10		PHY2303
51	PHY3347	<i>Semiconductors physics</i>	3	35	10		PHY3346
52	PHY3446	<i>Cryogenic physics</i>	3	35	10		PHY2302
53	PHY3401	<i>Optical communication</i>	3	35	10		PHY2304
54	PHY3512	<i>Pulse and Digital Modulation</i>	3	35	10		PHY3501
55	PHY3513	<i>Group theory</i>	3	35	10		PHY2306
56	PHY3514	<i>Introduction to Quantum Field Theory</i>	3	35	10		PHY2306
57	PHY3515	<i>Seismology</i>	3	35	10		PHY2304 INT1005
58	PHY3334	<i>Solid state physics theory</i>	3	35	10		PHY3605
59	PHY3517	<i>Theory of digital signal processing</i>	3	30	15		PHY3501
60	PHY3432	<i>Computer Simulation for Physics</i>	3	30	15		PHY3502
61	PHY3335	<i>Embedded System</i>	3	30	15		PHY2302 INT1005
62	PHY3472	<i>Standard model and its extention</i>	3	35	10		PHY3514

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
63	PHY3471	<i>Cosmology</i>	3	35	10		PHY3510
64	PHY3355	<i>Solid State Physics Laboratory</i>	3		45		PHY3346
65	PHY3356	<i>Quantum Optics Laboratory</i>	3		45		PHY2304
66	PHY3357	<i>Theoretical Physics Laboratory</i>	3		45		PHY3608
67	PHY3358	<i>Low Temperature Physics Laboratory</i>	3		45		PHY3446
68	PHY3359	<i>Geophysics Laboratory</i>	3		45		PHY3419
69	PHY3375	<i>Modern electronic engineering practice</i>	3		45		PHY3512 PHY3517
70	PHY3376	<i>Computational Physics Laboratory</i>	3		45		INT1005
71	PHY3377	<i>Computational Materials Science Laboratory</i>	3		45		PHY3346
72	PHY3378	<i>High energy physics and cosmology laboratory</i>	3		45		PHY3471
73	PHY3521	<i>Theory of Digital Communication</i>	3	30	15		PHY3501
74	PHY3522	<i>Microcontrollers</i>	3	30	15		PHY3501
75	PHY3523	<i>Electronic Aids to Measurement</i>	3	35	10		PHY3501
76	PHY3524	<i>Introduction to General Relativity</i>	3	35	10		PHY3500
77	PHY3526	<i>Potential methods applied in Geophysics</i>	3	35	10		PHY2303
78	PHY3527	<i>Introduction to quantum theory of Magnetism</i>	3	35	10		PHY2306
79	PHY3337	<i>Low dimensional physics</i>	3	35	10		PHY2306 PHY3608
80	PHY3528	<i>Quantum Field Theory for Many Bodies</i>	3	35	10		PHY2306
81	PHY3338	<i>Theory of elementary particles</i>	3	35	10		PHY2306

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
82	PHY3307	<i>Basic data system</i>	3	28	14	3	INT1005
83	PHY3380	<i>Parallel computing</i>	3	30	12	3	INT1005
84	PHY3351	<i>Physics of semiconductor devices</i>	3	35	10		PHY3347
85	PHY3707	<i>Magnetic measurements</i>	3	40		5	PHY2303
86	PHY3713	<i>Optoelectronic and photonics</i>	3	35	10		PHY2304
87	PHY3388	<i>Atomic spectroscopy</i>	3	36		9	PHY2306 PHY3606
88	PHY3390	<i>Molecular spectroscopy</i>	3	45			PHY2306
89	PHY3391	<i>Experimental optical spectroscopy</i>	3	40	3	2	PHY2303 PHY2306
90	PHY3333	<i>Quantum statistical physics</i>	3	30	15		PHY2306 PHY3608
91	PHY3392	<i>Introduction of soft materials physics and applications.</i>	3	36	9		PHY2303
92	PHY3393	<i>Solid state physics in low temperature.</i>	3	35	10		PHY2306 PHY3608
93	PHY3394	<i>Thermodynamics and applications</i>	3	35	10		PHY2302
94	PHY3448	<i>Superconductivity and applications</i>	3	35	10		PHY3420
95	PHY3404	<i>Geoelectrical Methods</i>	3	30	10	5	PHY2304
96	PHY3405	<i>Geomagnetical Methods</i>	3	30	7	8	PHY2303
97	PHY3406	<i>Radioactive and Nuclear Geophysics</i>	3	30	10	5	PHY2304
98	PHY3407	<i>Logging Geophysics</i>	3	30	10	5	PHY2304
99	PHY3408	<i>Geological for Geophysics</i>	3	30	10	5	PHY2304
100	PHY3423	<i>Principles and Applications of Ultrasound</i>	3	30	10	5	PHY3501

No	Code	Subjects	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
101	PHY3424	<i>Principles and Applications of Digital Communication Techniques</i>	3	30	10	5	PHY3501
102	PHY3414	<i>Vibrations</i>	3	45			PHY3501
103	PHY3710	<i>Amorphous materials</i>	3	30	15		PHY2303
104	PHY3452	<i>Magnetic intermetallic materials</i>	3	45			PHY3422 PHY2306
		<i>Supplemental</i>	3/9				
105	PHY3462	<i>Introduction to nanotechnology</i>	3	45			PHY3346
106	PHY3461	<i>Introduction to Materials Science</i>	3	30	15		PHY2306
107	PHY3530	<i>Biological Physics</i>	3	30	15		PHY2303
V.3		Undergraduate thesis	10				
108	PHY4074	<i>Thesis</i>	10				
		Tổng cộng	164				