

- **Advanced Program in Chemistry**

The Advanced Program in Chemistry started in 2006 with the collaboration from the University of Illinois at Urbana-Champaign (U.S.A). The total minimum required number of credits is 162.

- General education knowledge (<i>not including physical education, military defense education, and soft skills</i>)		38 credits
- Basic courses:		6 credits
+ <i>Required:</i>	6 credits	
+ <i>Elective:</i>	0 credits	
- Fundamental courses:		36 credits
+ <i>Required:</i>	28 credits	
+ <i>Elective:</i>	8 credits/13 credits	
- Core courses:		45 credits
+ <i>Required:</i>	32 credits	
+ <i>Elective:</i>	13 credits/19 credits	
- Advanced courses:		37 credits
+ <i>Required:</i>	18 credits	
+ <i>Elective:</i>	9 credits/85 credits	
+ <i>Undergraduate thesis:</i>	10 credits	

Available curriculum:

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
I		General education knowledge <i>(Not including subjects 12-14)</i>	38				
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>Revolutionary Strategies of Vietnamese Communist Party</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	FLF2104	<i>General English 4</i>	5	20	50	5	FLF2103
11	FLF2105	<i>General English 5</i>	5	20	50	5	FLF2104
12		<i>National Defence Education</i>	8				
13		<i>Physical Education</i>	4				
14		<i>Soft skills</i>	3				
II		Basic courses	6				
15	HIS1056	<i>Fundamentals of</i>	3	42	3		

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
		<i>Vietnamese Culture</i>					
16	GEO1050	<i>Earth and Life Sciences</i>	3	30	10	5	
III		Fundamental courses	36/41				
III.1		Required	28				
17	MAT1090	<i>Linear Algebra</i>	3	30	15		
18	MAT1091	<i>Calculus 1</i>	3	30	15		
19	MAT1092	<i>Calculus 2</i>	3	30	15		MAT1091
20	MAT1101	<i>Probability Statistics</i>	3	27	18		MAT1091
21	PHY1100	<i>Mechanics – Thermodynamics</i>	3	30	15		MAT1091
22	PHY1103	<i>Electromagnetism - Optics</i>	3	30	15		MAT1091
23	PHY1104	<i>General Physics Practice</i>	2	2	20	8	PHY1100
24	CHE1094	<i>Accelerated chemistry 1</i>	3	42	3		
25	CHE1095	<i>Accelerated chemistry 2</i>	3	40	5		CHE1094
26	CHE1096	<i>Accelerated chemistry Lab 2</i>	2	5	25	4	CHE1094
III.2		Elective	8/13				
27	CHE1097	<i>English for specific purposes-Math</i>	2	25	5		FLF2101
28	CHE1098	<i>English for specific purposes-Phys</i>	2	25	5		FLF2101
29	CHE1099	<i>English for specific purposes-Chem</i>	2	25	5		FLF2101
30	CHE1100	<i>English for composition 1</i>	2	30			FLF2101
31	CHE1101	<i>English for composition 2</i>	2	30			FLF2101
32	MAT1260	<i>Differential equations</i>	3	30	15		MAT1291
IV		Core courses	45/51				

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
IV.1		Required	32				
33	CHE2110	<i>Fundamental Organic chemistry 1</i>	4	40	5		CHE1095
34	CHE2111	<i>Organic chemistry Lab 1</i>	2		30		CHE1095
35	CHE2112	<i>Inorganic chemistry</i>	3	45	40	5	CHE1095
36	CHE2113	<i>Inorganic chemistry Lab</i>	2		30		CHE1096
37	CHE2114	<i>Organic chemistry 2</i>	3	42		3	CHE2110
38	CHE2115	<i>Organic chemistry Lab 2</i>	2		30		CHE2111
39	CHE2116	<i>Quantitative analysis</i>	3	40	5		CHE1095
40	CHE2117	<i>Quantitative analysis lab</i>	2		30		CHE2116
41	CHE2118	<i>Physical chemistry 1</i>	3	40	5		CHE1094
42	CHE2119	<i>Physical chemistry Lab 1</i>	2		30		CHE1095
43	CHE2122	<i>Physical chemistry 2</i>	4	55	5		CHE2118
44	CHE2123	<i>Physical chemistry Lab 2</i>	2		30		CHE2119
IV.2		Elective	13/19				
45	CHE2132	<i>Instrumental characterization</i>	3	45			CHE2116
46	CHE2133	<i>Instrumental characterization Lab</i>	2	5	25		CHE2116
47	CHE2120	<i>Principles of chemical engineering</i>	3	40	5		CHE1095
48	CHE2121	<i>Chemical engineering Lab</i>	2		30		CHE2120
49	CHE2145	<i>Environmental chemistry</i>	3	45			CHE2116
50	CHE2137	<i>Introduction to material chemistry</i>	3	45			CHE2112
51	CHE3045	<i>Petrochemistry</i>	3	42		3	CHE1052
V		Advanced courses	37/10				

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
			3				
V.1		Required	18				
52	CHE2128	<i>Advanced inorganic chemistry</i>	3	45			CHE2112
53	CHE2131	<i>Advanced organic chemistry</i>	3	45			CHE2114
54	CHE2129	<i>Advanced analytical chemistry</i>	3	45			CHE2116
55	CHE2130	<i>Chemical kinetics and catalysis</i>	3	45			CHE2122
56	CHE3101	<i>Research project 1</i>	3		40	5	CHE1096
57	CHE3102	<i>Research project 2</i>	3		40	5	CHE3101
V.2		Elective	9/85				
58	CHE2010	Industrial Practice	2		30		
59	CHE2139	<i>Molecular symmetry and group theory</i>	3	45			
60	CHE2147	<i>Green chemistry</i>	3	45			CHE2116
61	CHE2138	Biochemistry and Life Science	3	45			
62	CHE2146	<i>Chemical reaction engineering</i>	3	45			CHE2120
63	CHE2151	<i>Polymer science and applied engineering</i>	3	45			CHE2137
64	CHE3211	<i>Physical inorganic chemistry</i>	3	40		5	CHE2112
65	CHE3215	<i>Topics in inorganic chemistry</i>	3	40		5	CHE2112
66	CHE3212	<i>Physical characterization for Material chemistry</i>	3	40		5	CHE2112
67	CHE3213	<i>Bioinorganic chemistry</i>	3	40		5	CHE2112

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
68	CHE3192	<i>Applied inorganic chemistry</i>	3	40		5	CHE2112
69	CHE3205	<i>Physical organic chemistry</i>	3	40		5	CHE2110
70	CHE3247	<i>Organic catalyst</i>	3	40		5	CHE2110
71	CHE3142	<i>Chemistry of natural Compound</i>	3	40		5	CHE2110
72	CHE3220	<i>Topics in organic chemistry</i>	3	40		5	CHE2110
73	CHE3219	<i>Characterization methods for organic chemistry</i>	3	40		5	CHE2110
74	CHE3187	<i>Fundamental of modern organic chemistry</i>	3	40		5	CHE2110 CHE2114
75	CHE3218	Advanced organic synthesis	3	40		5	CHE2110
76	CHE3248	<i>Sample preparation techniques in Analysis</i>	3	40		5	CHE2116
77	CHE3139	<i>Spectrophotometric Analysis</i>	3	40		5	CHE2116
78	CHE3009	<i>Electrochemical analysis</i>	3	40		5	CHE2116
79	CHE3250	<i>Separation and Chromatographic Analysis</i>	3	40		5	CHE2116
80	CHE3014	<i>Chemometrics in analytical chemistry</i>	2	28		2	CHE2116
81	CHE3234	<i>Topics in physical chemistry</i>	3	40		5	CHE2122
82	CHE3230	<i>Statical thermodynamic</i>	3	40		5	CHE2122
83	CHE3144	<i>Catalytic theories and</i>	3	40		5	CHE2122

No.	Code	Subject	Credits	Credit hours			Prerequisite
				Lecture	Practice	Self-study	
		<i>applications</i>					
84	CHE2141	<i>Surface and colloid chemistry</i>	3	45			CHE2122
85	CHE2140	<i>Computational Chemistry and Biology</i>	3	45			INT1003
86	CHE2102	<i>Polymer chemistry</i>	3	40		5	CHE2110
V.3		Undergraduate thesis	10				
87	CHE4054	<i>Undergraduate thesis</i>	10				
		Total	162				