

THE ADVANCED PROGRAM IN BIOTECHNOLOGY

1. Expected learning outcomes

The graduates from the Program will be able to:

1. apply the generic knowledge of social and humanity science and natural science to the professional activities to increase work performance;
2. analyze the specialized knowledge in biotechnology for effective applications in professional work to achieve better work performance;
3. select and enhance the use of techniques, skills, and up-to-date technological tools necessary for biotechnology practices in reality; design and conduct experiments to arrive at solutions to improve work performance;
4. conduct various activities to design, organize, manage and operate production facilities in biotechnology;
5. analyze the demands and mobilize all resources available to design processes to help organize, manage and operate biotechnology activities (namely the production of new plant and animal varieties, new microorganisms; microbiological products, techniques...);
6. identify and compare work issues to come up with solutions to problems in biotechnology and be able to create a service business;
7. apply effective skills in communication to exchange and sharing information in collaboration to develop biotechnology; develop leadership, teamwork and soft skills for employment and promotion;
8. construct life-long learning as a personal skill and consciousness and integrate study and research in daily work to be ready for national and international research collaboration; and
9. protect and improve personal health, fulfill civic responsibility, abide by the laws, be insightful on contemporary political and social issues, and contribute to sustainable development of the biotechnology area, the environment, and the society.

Expected learning outcomes grouped by knowledge, skills, attitudes and life-long learning

Knowledge, Skills, Attitudes		ELOs
Generic Knowledge	Mathematic, Scientific, and Social	1, 9
Generic Skills	Communicating, sense of chemical and biochemical analysis, synthesis approaches, Biotechnology, critical thinking, team work, self-regulating, problem solving, self-study	3, 6, 7
Specific Knowledge	Fundamental and specialized biotechnology	2, 4, 5, 6
Specific Skills	Use of common Lab instruments and equipments, experimental design and data analysis and assessment	3, 4, 5
Attitudes	Professional and social ethical and responsibility	8, 9
Life-long learning	Scientific knowledge and skills	1, 2, 3, 4, 5, 6
	Learning and communication skills	7
	Perception of life-long learning	9, 8

2. Expected learning outcomes vs. Course matrix

Knowledge Blocks	No	Courses	# Credit	1	2	3	4	5	6	7	8	9	
				General knowledge (compulsory) (56 credits)									
Political Education	1	ML009	Principles of Marxist-Leninism 1	3	H	N	N	N	N	N	S	N	H
	2	ML010	Principles of Marxist-Leninism 2	3	H	N	N	N	N	N	S	N	H
	3	ML115	History of Vietnamese Communist Party	2	H	N	N	N	N	N	S	N	H
	4	ML144	Ho Chi Minh's Ideology	2	H	N	N	N	N	N	S	N	H
English	5	EN101	Advanced English I	3	H	S	S	S	S	S	H	H	S
	6	EN102	Advanced English II	3	H	S	S	S	S	S	H	H	S
	7	EN103	Writing: Sciences & Technology	3	H	S	S	S	S	S	H	H	S
Natural Sciences & Maths	8	CS101	Basic informatics	1	H	S	S	H	H	H	S	S	S
	9	CS201	Basic informatics Lab.	2	H	S	H	H	H	H	S	S	S
	10	BS110	Cells and Molecules	3	S	H	S	S	N	S	S	S	S
	11	BS210	Cells and Molecules Lab I	1	N	S	S	H	S	H	S	S	S
	12	MT132	Calculus I & II	6	H	S	N	S	N	S	N	S	N
	13	PH183	Physics for Scientists and Engineers I	4	H	S	S	S	N	S	S	S	N
	14	PH184	Physics for Scientists and Engineers II	4	H	S	S	S	N	S	S	S	N
	15	CH141	General Chemistry I	3	H	S	S	S	N	S	S	S	S

Knowledge Blocks		No	Courses	# Credit	1	2	3	4	5	6	7	8	9	
		16	CH161	General Chemistry Lab I	1	H	S	H	H	S	S	H	S	N
		17	CH142	General Chemistry II	3	H	S	S	S	S	S	S	S	S
		18	CH162	General and Inorganic Chemistry Lab II	1	H	S	H	H	S	S	H	S	N
	General Education	19	QP001	Defense Education	6	H	N	N	N	N	N	H	N	H
		20	TC100	Physical Training	2	H	N	N	N	N	S	S	S	H
Fundamental knowledge	Basic (compulsory) (30 credits)	21	ZO341	Fundamental Genetic	4	H	H	S	S	N	S	S	S	N
		22	MI301	Introductory Microbiology	3	H	H	S	S	S	S	S	S	N
		23	MI302	Introductory Microbiology Lab	1	H	H	H	H	S	S	H	S	N
		24	BS111	Organism and Populations II	3	H	H	S	S	S	S	S	S	N
		25	BS211	Organism and Population Lab II	1	H	H	H	H	S	S	H	S	N
		26	CH351	Organic Chemistry I	3	H	H	S	S	S	S	S	N	N
		27	CH352	Organic Chemistry II	3	H	H	S	S	S	S	S	S	N
		28	CH355	Organic Chemistry Laboratory	2	H	H	S	S	S	S	S	N	N
		29	BC461	Biochemistry I	3	S	H	H	S	S	S	S	S	S
		30	BC471	Biochemistry Laboratory I	2	S	H	H	S	S	S	H	S	N
		31	BC462	Biochemistry II	3	S	H	H	S	S	S	S	S	S
		32	BC472	Biochemistry Laboratory II	2	S	H	H	H	S	S	S	S	N
	Advanced (Compulsory courses) (16 credits)	33	BT100	Guideline in Biotechnology	0	S	S	S	S	H	S	S	S	S
		34	CS464	Statistics for Biologists	3	H	N	S	H	H	S	S	S	N
		35	BT300	Research Methods	2	H	H	S	S	H	H	S	S	N
		36	BT197	Biotechnology Seminar I	1	S	H	S	S	H	S	H	S	S
		37	BT198	Biotechnology Seminar II	1	S	H	S	S	H	S	H	S	S
		38	BT199	Biotechnology Seminar III	1	S	H	S	S	H	S	H	S	S
		39	BT298	Biotechnology Seminar IV	2	S	H	S	S	H	S	H	S	S
		40	BT299	Biotechnology Seminar V	2	S	H	S	S	H	S	H	S	S
		41	BT303	Bio-informatics	3	H	H	S	S	S	S	H	S	S
		42	BT200	Field trip	1	H	H	S	S	H	H	S	S	S
Professional major knowledge	Required major courses (20 credits)	43	BT201	Introduction Biotechnology	2	H	H	N	S	H	S	S	S	S
		44	MM445	Basic Biotechnology	4	H	H	N	S	H	S	S	S	S
		45	BB801	Molecular Biology	4	S	H	S	S	H	S	S	S	S
		46	BT301	Genomics and its application	4	S	H	S	S	H	S	S	S	S
		47	MM433	Microbial Genomics	3	S	H	S	S	H	S	S	S	S
		48	BT480	Practical training in industry/ Biotech institutions	3	H	H	H	S	H	H	H	S	S

Knowledge Blocks		No	Courses	# Credit	1	2	3	4	5	6	7	8	9	
Elective major courses (19/44 credits)		49	BT305	Plant tissue culture	3	S	H	S	S	H	H	S	S	S
		50	BT306	Proteomics	4	S	H	S	S	H	H	S	S	S
		51	BT304	Food Fermentation	3	S	H	S	S	H	S	S	S	S
		52	CS441	Plant Breeding and Biotechnology	3	S	H	S	S	H	H	S	S	S
		53	SH058	Aquaculture Biotechnology	3	S	H	S	S	H	H	S	S	S
		54	ZO892	Biodiversity	2	S	H	N	N	H	S	S	S	S
		55	TT465	Plant physiology	3	S	H	S	S	H	S	S	S	S
		56	SH072	Animal physiology	3	S	H	S	S	H	S	S	S	S
		57	CB344	Food Biochemistry	3	S	H	S	S	H	S	S	S	S
		58	FS440	Food Microbiology	3	S	H	S	S	H	S	S	S	S
		59	MM413	Virology	3	S	H	S	S	H	S	S	S	S
		60	AN407	Food and Animal Toxicology	3	S	H	S	S	H	S	S	S	S
		61	HR486	Biotechnology in Agriculture: Applications and Ethical Issues	3	S	H	N	S	H	S	S	S	S
		62	BB856	Plant Molecular Biology	3	S	H	S	S	H	S	S	S	S
	63	BT302	Social and Economical Aspects of Biotechnology	2	S	H	S	S	H	S	S	S	S	
Graduation Thesis		64	BT499	Graduation thesis	10	S	H	H	H	H	S	H	S	S

Note: H = Highly Supportive; S = Supportive; N = None