



Bachelor of Science in Biotechnology (International Program)
Faculty of Science, Chulalongkorn University

PROGRAM STRUCTURE

Total Credits	125	credits
1. General Education	30	credits
2. Specialization	89	credits
2.1 Basic Sciences and Mathematics	32	credits (36 credits for Cooperative Education)
2.2 Required Courses	31	credits
2.3 Elective Courses	26	credits (22 credits for Cooperative Education)
2.3.1 Required Electives		
2.3.2 Electives		
3. Free Electives	6	credits

1. General Education 30 credits

1.1 Social Science	3	credits
1.2 Humanities	3	credits
1.3 Interdisciplinary	3	credits
1.4 Science and Mathematics	3	credits
1.5 Language	12	credits
5503111 ENGLISH COMMUNICATION FOR SCIENCE I		3(3-0-6)
5503122 ENGLISH COMMUNICATION FOR SCIENCE II		3(3-0-6)
5503213 COMMUNICATION AND PRESENTATION SKILLS FOR SCIENCE		3(3-0-6)
Course from the other languages that are not English or native language	3	credits
1.6 Special Group	6	credits
2301170 COMPUTER AND PROGRAMMING		3(3-0-6)
Course from the list of General Education courses except those in Science and Mathematics	3	credits

2. Specialization 89 credits

2.1 Basic Sciences and Mathematics

2.1.1 Regular Program	32	credits
2300399 PROJECT PROPOSAL		1(1-0-2)
2300490 SEMINAR		1(1-0-2)
2300499 SENIOR PROJECT		2(0-6-0)
2301107 CALCULUS I		3(3-0-6)
2301108 CALCULUS II		3(3-0-6)
2301286 PROBABILITY AND STATISTICS		3(2-2-5)
2302101 GENERAL CHEMISTRY I		3(3-0-6)
2302102 GENERAL CHEMISTRY II		3(3-0-6)
2302103 GENERAL CHEMISTRY LABORATORY		1(0-3-0)
2303101 GENERAL BIOLOGY I		3(3-0-6)
2303102 GENERAL BIOLOGY LABORATORY I		1(0-3-0)
2304151 ESSENTIAL PHYSICS		3(3-0-6)
2304197 PHYSICS LABORATORY FOR BIOLOGISTS		1(0-3-0)
2305101 GENERAL BIOLOGY II		3(3-0-6)
2305102 GENERAL BIOLOGY LABORATORY II		1(0-3-0)

2.1.2 Cooperative Education	36	credits
2300399 PROJECT PROPOSAL	1(1-0-2)	
2300490 SEMINAR	1(1-0-2)	
2300498 COOPERATIVE EDUCATION	6(0-18-0)	
2301107 CALCULUS I	3(3-0-6)	
2301108 CALCULUS II	3(3-0-6)	
2301286 PROBABILITY AND STATISTICS	3(2-2-5)	
2302101 GENERAL CHEMISTRY I	3(3-0-6)	
2302102 GENERAL CHEMISTRY II	3(3-0-6)	
2302103 GENERAL CHEMISTRY LABORATORY	1(0-3-0)	
2303101 GENERAL BIOLOGY I	3(3-0-6)	
2303102 GENERAL BIOLOGY LABORATORY I	1(0-3-0)	
2304151 ESSENTIAL PHYSICS	3(3-0-6)	
2304197 PHYSICS LABORATORY FOR BIOLOGISTS	1(0-3-0)	
2305101 GENERAL BIOLOGY II	3(3-0-6)	
2305102 GENERAL BIOLOGY LABORATORY II	1(0-3-0)	

2.2 Required Courses	31	credits
2300251 CONCEPTS AND ISSUES IN BIOTECHNOLOGY	3(3-0-6)	
2300252 PRINCIPLES OF BIOLOGICAL PROCESS ENGINEERING	3(3-0-6)	
2300253 SCIENCE ETHICS	1(1-0-2)	
2300351 BIOTECHNOLOGICAL FRONTIER IN PLANT AND ANIMAL BREEDING	3(3-0-6)	
2300401 INTEGRATIVE SCIENCE PROJECT	3(0-9-0)	
2300492 TRAINING	0	
2301172 COMPUTER AND PROGRAMMING LABORATORY	1(0-2-1)	
2302203 ORGANIC CHEMISTRY LABORATORY	1(0-3-0)	
2302271 ORGANIC CHEMISTRY I	3(3-0-6)	
2302272 ORGANIC CHEMISTRY II	3(3-0-6)	
2305261 GENERAL GENETICS	3(3-0-6)	
2310310 GENERAL BIOCHEMISTRY	3(3-0-6)	
2310360 GENERAL BIOCHEMISTRY LABORATORY	1(0-3-0)	
2312302 GENERAL MICROBIOLOGY	3(2-3-4)	

2.3 Elective Courses	26	credits
	(22 credits for Cooperative Education)	
2.3.1 Required Electives	7	credits

Select all courses in one of the following groups:

Group 1

2300361 INTRODUCTION TO MOLECULAR BIOTECHNOLOGY	3(3-0-6)
2300362 BIOLOGICAL SEQUENCE ANALYSIS	3(2-2-5)
2305262 GENERAL GENETICS LABORATORY	1(0-3-0)

Group 2

2300261 INDUSTRIAL ADMINISTRATION AND MANAGEMENT	1(1-0-2)
2602313 MANAGEMENT AND ORGANIZATION	3(3-0-6)
2605311 PRINCIPLE OF MARKETING	3(3-0-6)

Group 3

2314335 PROCESSING IN FOOD BIOTECHNOLOGY I	3(3-0-6)
2314336 PROCESSING IN FOOD BIOTECHNOLOGY II	3(3-0-6)
2314339 PROCESSING IN FOOD BIOTECHNOLOGY LABORATORY	1(0-3-0)

2.3.2 Electives

19 credits
(15 credits for Cooperative Education)

2300301 COMPUTER SKILLS IN BIOINFORMATICS.....	3(2-3-4)
2300363 TREND IN BIOTECHNOLOGY.....	2(2-0-4)
2300364 CLEAN BIOTECHNOLOGY.....	3(3-0-6)
2300500 TECHNOPRENEURSHIP.....	3(3-0-6)
2303251 ANIMAL WELFARE AND BIOSECURITY.....	2(2-0-4)
2303425 FRONTIERS IN ANIMAL BIOTECHNOLOGY.....	3(3-0-6)
2303435 REGENERATIVE BIOLOGY.....	3(2-3-4)
2303455 BIOLOGY OF DISEASE.....	3(3-0-6)
2305354 HYDROPONICS.....	2(2-0-4)
2305355 HYDROPONICS FOR CROP PRODUCTION LABORATORY.....	1(0-3-0)
2305451 PLANT TISSUE CULTURE.....	3(3-0-6)
2305452 PLANT TISSUE CULTURE LABORATORY.....	1(0-3-0)
2305453 COMMERCIAL ORNAMENTAL PLANT PRODUCTION.....	3(2-3-4)
2305481 PLANT BIOTECHNOLOGY.....	2(2-0-4)
2305486 ECONOMIC MUSHROOM CULTIVATION.....	3(2-3-4)
2308341 SCIENCE COMMUNICATION.....	3(3-0-6)
2308351 ENVIRONMENTAL SCIENCE I.....	3(3-0-6)
2308359 ENVIRONMENTAL SCIENCE LABORATORY I.....	1(0-3-0)
2308418 ENVIRONMENTAL REMEDIATION TECHNOLOGY.....	3(3-0-6)
2308419 PRINCIPLES OF BIODEGRADATION AND BIOREMEDIATION.....	3(3-0-6)
2308439 BIOPOLYMER IN ENVIRONMENT.....	3(3-0-6)
2309417 PRINCIPLES OF AQUACULTURE.....	3(3-0-6)
2309419 MARINE MICROALGAL CULTURE METHODOLOGY.....	3(2-3-4)
2309519 FISH AND SHELLFISH NUTRITION.....	3(2-3-7)
2309522 BREEDING AND LARVICULTURE OF ECONOMIC AQUATIC ANIMALS.....	3(2-3-7)
2310451 GENOMIC ANALYSIS FOR BIOTECHNOLOGY.....	3(2-2-5)
2310454 INTRODUCTION TO GENETIC ENGINEERING.....	1(1-0-2)
2310506 BIOINFORMATICS I.....	3(2-2-8)
2310555 GENETIC ENGINEERING LABORATORY.....	2(0-6-2)
2312515 MICROBIAL BIOTECHNOLOGY AND MICROBIAL INDUSTRY VISIT.....	3(2-3-7)
2312516 MODERN MICROBIAL BIOTECHNOLOGY AND MICROBIOME.....	3(3-0-9)
2312517 MEDICAL MICROBIAL BIOTECHNOLOGY.....	3(3-0-6)
2312589 IMMUNOTECHNOLOGY.....	2(1-3-4)
2314375 BIOLOGICAL CHEMISTRY FOR BIOTECHNOLOGY.....	3(3-0-6)
2314434 INDUSTRIAL MICROBIOLOGY.....	3(2-3-4)
2314435 BIOTECHNOLOGY FOR FOOD INDUSTRY.....	2(2-0-4)
2314572 FOOD PRODUCT DESIGN.....	2(2-0-6)
2314573 APPLIED FOOD MICROBIOLOGY.....	3(3-0-6)

Or choose from 2.3.1 required electives (courses from other groups, aside from the one in which the student has completed 7 credits).

3. Free Electives 6 credits

Select any courses taught in English (Semester-International System) in Chulalongkorn University