

Bachelor of Science Program in Biological Sciences (International Program)
(For Students ID 63xxxxx)

1. Code and Program Title

Thai	หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวภาพ (หลักสูตรนานาชาติ)
English	Bachelor of Science Program in Biological Sciences (International Program)

2. Title of Degree and Field of Study

In Thai	Full Title	วิทยาศาสตรบัณฑิต (วิทยาศาสตร์ชีวภาพ)
	Abbreviation	วท.บ. (วิทยาศาสตร์ชีวภาพ)
In English	Full Title	Bachelor of Science (Biological Sciences)
	Abbreviation	B.Sc. (Biological Sciences)

3. Major Subjects -

4. Career Opportunities of the graduates

- 1) Work as teaching assistants in the field of Biological Sciences at any academic institutes or universities.
- 2) Pursue a teaching career as primary- and secondary-school teachers in the field of Biological Sciences at any international schools.
- 3) Work in a research and development department of any biological products companies or manufacturers.
- 4) Quality control or quality assurance positions.
- 5) Research assistants in any research institutes and projects or programs.
- 6) In scientific instruments trading and services in private and public sectors.
- 7) Customer relations for biological or biomedical product companies or private hospitals that require personnel with good command of English.
- 8) Owner of the companies that sell products and/or services in the field of biological sciences.
- 9) Continue their studies for higher degree in any fields of biological sciences, health care professionals, and related fields, such as dentistry, veterinary science and pharmacy.

5. Total Credits Required

No less than 168 credits

6. Program Structure

1) Foundation Courses	None	credits
2) General Education Courses	38	credits
1. English Communication	12-16	credits
2. Life Appreciation	4	credits
3. Global Citizenship	4	credits
4. Critical Thinking	4	credits
5. Leadership	4	credits
6. Digital Literacy	4	credits
7. GE Electives	2-6	credits
3) Major Courses	102	credits
1. Core Science Courses	26	credits
2. Major Core Courses	28	credits
3. Required Major Courses	38	credits
4. Elective Major Courses	20	credits
4) I-Design Electives	20	credits
5) Free Electives	8	credits

Foundation Courses

Non-credit

Note I: For B.B.A. students, students whose Mathematics placement is below ICMB 200 Business Mathematics are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMB 200 Business Mathematics.

For B.Sc. and B.Eng. students, students whose Mathematics placement is below ICMA 106 Calculus I and/or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I and/or ICMA 151 Statistics for Science I.

Note II: Based on their achievement on the essay portion of the MUIC entrance exam, students whose English placement is below ICGC 101 Academic Writing and Research I will be placed into the "ERS Track". These students will be required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I.

ICMA 100	Foundation Mathematics	0
ICME 100	English Resource Skills	0

General Education Courses

38 credits

● English Communication

12-16 credits

Note I: Based on their achievement on the essay portion of the MUIC entrance exam, students will be placed into 3 following tracks: 'ERS Track', 'GC Track' and 'Advanced GC Track'.

- 'ERS Track' – Students who are placed into 'ERS Track' will be required to take ICME 100 (a non-credit course) and complete 16 credits in English Communication: ICGC 101, ICGC 102, ICGC 103 in order, and finally, any 200+ level English courses.
- 'GC Track' – Students who are placed into 'GC Track' will be required to complete 16 credits in English Communication: ICGC 101, ICGC 102, ICGC 103 in order, and finally, any 200+ level English courses.
- 'Advanced GC Track' – Students who are placed into 'Advanced GC Track' will be required to complete 12 credits in English Communication: ICGC 111, ICGC 112 in order, and finally, any 200+ level English courses.

Note II: Students in 'ERS Track' and 'GC Track' must take ICGC 101, ICGC 102 and ICGC 103 without interruption beginning in their first trimester of enrollment.

ICGC 101	Academic Writing and Research I	4
ICGC 102	Academic Writing and Research II	4
ICGC 103	Public Speaking	4
ICGC 111	Academic Writing and Research I (Advanced)	4
ICGC 112	Academic Writing and Research II (Advanced)	4
ICGC 201	Global Realities	4
ICGC 202	Literary Analysis	4
ICGC 203	Creative Writing	4
ICGC 204	Advanced Oral Communication	4
ICGC 206	Literature Into Film	4
ICGC 208	Language and Culture	4
ICGC 210	First and Second Language Acquisition	4
ICGC 211	Topics in Comparative Literature A: Poetry	4
ICGC 212	Topics in Comparative Literature B: The Short Story and the Novel	4
ICGC 213	Topics in Comparative Literature C: Drama	4
ICGC 214	Literary Non-fiction	4
ICGC 215	Writing for Research	4

● **Life Appreciation**

4 credits

ICGH 113	Moving Pictures: A History of Film	4
ICGH 117	Drawing as Creative Expression	4
ICGH 118	Photography Visualizing in the Digital Age	4
ICGH 119	Listen! Soundscapes, Well-Being and Musical Soul Searching	4
ICGN 105	Ecology, Ecosystems and Socio-Economics in Southeast Asia	4
ICGN 108	Essentials of Culinary Science for Food Business	4
ICGN 109	Food for Health	4
ICGN 110	Maker Workshop	4
ICGN 112	Stargazer	4
ICGN 113	Plants, People and Poisons	4
ICGN 115	Human Evolution, Diversity and Health	4
ICGN 120	Chemistry of Cosmetics and Dietary Supplements	4
ICGN 124	Climate Change and Human Society	4
ICGN 125	Games and Learning	2

ICGP 101	American Flag Football	1
ICGP 102	Badminton	1
ICGP 103	Basketball	1
ICGP 104	Body Fitness	1
ICGP 105	Cycling	1
ICGP 106	Discover Dance	1
ICGP 107	Golf	1
ICGP 108	Mind and Body	1
ICGP 109	Selected Topics in Sports	1
ICGP 110	Self Defense (Striking)	1
ICGP 111	Self Defense (Grappling)	1
ICGP 112	Soccer	1
ICGP 113	Social Dance	1
ICGP 114	Swimming	1
ICGP 115	Tennis	1
ICGP 116	Volleyball	1
ICGS 102	Business Sustainability and the Global Climate Change	4
ICGS 115	Sociology in the Modern World	4
ICGS 125	American History, Popular Media and Modern Life	4
ICGS 126	Introduction to Psychology	4
ICGS 127	Positive Psychology	4
ICGS 128	Global Gastronomy and Cuisines	4
ICGS 129	Tea Studies	2
ICLL 100	Self Development	2

● **Global Citizenship**

4 credits

ICGH 116	World Cinemas	4
ICGH 120	Thai and ASEAN Cinema	4
ICGH 121	The End of the World? Development and Environment	4
ICGH 122	Introduction to Asian Philosophy	4
ICGH 123	Faiths, Ecological Justice, and the Tropical Rainforests	2
ICGL 101	Elementary German I	4
ICGL 102	Elementary German II	4

ICGL 103	Elementary German III	4
ICGL 111	Elementary Japanese I	4
ICGL 112	Elementary Japanese II	4
ICGL 113	Elementary Japanese III	4
ICGL 121	Elementary French I	4
ICGL 122	Elementary French II	4
ICGL 123	Elementary French III	4
ICGL 131	Elementary Chinese I	4
ICGL 132	Elementary Chinese II	4
ICGL 133	Elementary Chinese III	4
ICGL 141	Elementary Spanish I	4
ICGL 142	Elementary Spanish II	4
ICGL 143	Elementary Spanish III	4
ICGL 160	Introduction to Thai Language and Culture	4
ICGL 161	Elementary Thai I	4
ICGL 162	Elementary Thai II	4
ICGL 163	Elementary Thai III	4
ICGL 170	Diversities in Multilingual Societies	2
ICGL 201	Pre-intermediate German I	4
ICGL 202	Pre-intermediate German II	4
ICGL 203	Pre-intermediate German III	4
ICGL 211	Pre-intermediate Japanese I	4
ICGL 212	Pre-intermediate Japanese II	4
ICGL 213	Pre-intermediate Japanese III	4
ICGL 221	Pre-intermediate French I	4
ICGL 222	Pre-intermediate French II	4
ICGL 223	Pre-intermediate French III	4
ICGL 231	Pre-intermediate Chinese I	4
ICGL 232	Pre-intermediate Chinese II	4
ICGL 233	Pre-intermediate Chinese III	4
ICGL 241	Pre-intermediate Spanish I	4
ICGL 242	Pre-intermediate Spanish II	4
ICGL 243	Pre-intermediate Spanish III	4

ICGN 126	Plant Society	2
ICGS 106	Fashion and Society	4
ICGS 111	Exploring Religions	4
ICGS 112	Geography of Human Activities	4
ICGS 123	Tourism Concepts and Practices	4
ICGS 130	Political Science	4
ICGS 131	Introduction to International Studies	4
ICGS 132	Career Preparation in a Globalized World	4
ICGS 133	Foundation of Mediterranean Cultures	4

● **Critical Thinking**

4 credits

ICGH 101	Biotechnology: from Science to Business	4
ICGH 102	Famous Arguments and Thought Experiments in Philosophy	4
ICGH 103	Logic, Analysis and Critical Thinking: Good and Bad Arguments	4
ICGH 105	Technology, Philosophy and Human Kind: Where Are We Now?!	4
ICGH 106	The Greeks: Crucible of Civilization	4
ICGH 107	Contemporary Art and Visual Culture	4
ICGH 109	Creative Thinking Through Art and Design	4
ICGH 110	Drawing as Visual Analysis	4
ICGH 115	Cinematic Languages and Its Application	4
ICGH 124	Life Drawing and Anatomy	4
ICGH 125	How Can We Know What Is Good? Moral Reasoning and Behavior	4
ICGH 126	Behavioral Ethics: Why Good People Do Bad Things	2
ICGN 107	The Chemistry of Everyday Life	4
ICGN 111	Physics for CEO	4
ICGN 123	The Earth's Dynamic Structure	4
ICGN 127	Practical Mathematics	2
ICGS 103	Economics in Modern Business	4
ICGS 113	Perspectives on the Thai Past	4
ICGS 134	Is Democracy Good?	4
ICGS 135	Entrepreneurial Accounting	4

● **Leadership**

4 credits

ICGN 114	The Scientific Approach and Society	4
ICGN 128	Climate Emergency, Biodiversity Crisis, and Humanity at Risk	2
ICGS 104	Essentials of Entrepreneurship	4
ICGS 118	Skills in Dealing with People Across Cultures	4
ICGS 121	Abnormal Colleagues: How Do I Make This Work?	4
ICGS 136	Social and Health Issues in Thailand	4
ICGS 137	Witchcraft and Gender Representation	4
ICGS 138	Business Event Essentials	4
ICGS 139	Leadership and Change for a Global Society	4
ICLL 101	Professional Development	2

● **Digital Literacy**

4 credits

ICGH 111	Media Literacy: Skills for 21st Century Learning	4
ICGN 116	Understanding and Visualizing Data	4
ICGN 118	Everyday Connectivity	4
ICGN 119	Computer Essentials	4
ICGN 129	Programming for Problem Solving	4
ICGN 130	Cryptography: The Science of Making and Breaking Codes	2
ICGN 131	Digital Search Literacy	2
ICGN 132	Digital Security and Privacy	2
ICGN 133	E-Business: Technology and Digital Strategies	4
ICGN 134	Introduction to Artificial Intelligence	2
ICGS 140	Fake News, Censorship and the Politics of Truth	4
ICLL 102	Skills for a Digital World	2

● **General Education Elective Course**

2-6 credits

Students need to take any GE courses to fulfill their 38 credits requirement of General Education: 2 credits for students whose English Communication track are placed into ‘ERS track’ or ‘GC Track’ and 6 credits for students whose English Communication track are placed into ‘Advanced GC Track’. Partial credits of GE course that exceed the GE requirements cannot be counted towards Free Electives.

Major Courses**102 credits****● Core Science Courses****26 credits**

ICBI 121*	Biology I	4
ICCH 101	General Chemistry I	4
ICCH 102	General Chemistry II	4
ICCH 103	Integrated Laboratory Techniques in Chemistry I	2
ICMA 106	Calculus I	4
ICPY 101	Physics I	4
ICPY 105	Integrated Laboratory in Physics I	2
ICSC 333	Scientific Research and Presentations	2

Note* ICBI 121 Biology I can be bypassed (with credits rewarded) if students have already taken equivalent courses that can be transferred according to Mahidol University regulations.

● Major Core Courses**28 credits**

ICBI 207	Ethics for Bioscience	4
ICBI 214	General Microbiology	4
ICBI 271	General Microbiology Laboratory	2
ICCH 221	Organic Chemistry I	4
ICCH 223	Organic Chemistry Laboratory Techniques	2
ICCH 225	Biochemistry	4
ICCH 226	Biochemistry Laboratory	2
ICMA 151	Statistics for Science I	4
ICMA 252	Biological Statistics Laboratory	2

● Major Required Courses**38 credits**

ICBI 213	Genetics	4
ICBI 216	Cell Biology	4
ICBI 221	Animal Biology	4
ICBI 231	Plant Biology	4
ICBI 262	Practical Field Ecology and Conservation	4
ICBI 308	Molecular Biology	4
ICBI 381	Evolutionary Biology	4
ICBI 383	Systematic Biology and Biodiversity	2
ICBI 499	Research Project and Seminar in Biological Sciences	8

● **Major Elective Courses**

at least 10 credits

For students in the Biological Sciences Program, the major electives courses are developed to enable deeper pursuit of a specific area of Biological Sciences. These courses may, if the student wishes, be further specialized into three different modules and a minor, namely module in biomedical science, module in ecology and conservation, module in biotechnology, and a minor in bioinformatics. It should be noted that students are not required to select a module to graduate with a B.Sc. in Biological Sciences. Regardless, they are required to earn at least 10 credits from Major Elective courses.

Major Elective courses listed by module:

The Biomedical Science Module (at least 20 credits)

ICBI 204	Developmental Biology	4
ICBI 301	Functional Histology	4
ICBI 303	Basic Immunology	4
ICBI 305	Human Anatomy I	4
ICBI 306	Human Anatomy II	4
ICBI 307	Nutrition and Dietetics	4
ICBI 309	Pathobiology	4
ICBI 311	Human Physiology	4
ICBI 324	Introduction to Medical Toxicology	4
ICBI 328	Essential Pharmacology	4
ICBI 332	Medical Microbiology	4
ICBI 341	Neurobiology	4
ICBI 391	Health Psychology	4
ICBI 402	Epidemiology	4
ICBI 403	Introduction to Tropical Medicine	4
ICBI 404	Molecular Biology Laboratory	2
ICBI 405	Community Health	4
ICBI 406	Ergonomics	2
ICBI 407	Occupational Health and Safety	4
ICBI 411	Psychopathology	4
ICCH 222	Organic Chemistry II	4

The Ecology and Conservation Module (at least 20 credits)

ICBI 385	Freshwater Ecology and Conservation	4
ICBI 386	Practical Freshwater Ecology and Conservation	2
ICBI 387	Terrestrial Ecology and Conservation	4
ICBI 388	Practical Terrestrial Ecology and Conservation	2
ICBI 440	Marine Ecology and Conservation	4
ICBI 442	Practical Marine Ecology and Conservation	2
ICBI 443	Fungal Ecology	4

The Biotechnology Module (at least 20 credits)

ICBI 315	Microbial Physiology and Genetics	4
ICBI 316	Environmental Microbiology	4
ICBI 372	Utilization of Water and Wastewater Treatment	4
ICBI 404	Molecular Biology Laboratory	2
ICBI 414	Industrial Microbiology	4
ICBI 415	Biotechnology	4
ICBI 432	Plant Biotechnology	4
ICBI 433	Fermentation Technology	4
ICBI 434	Food Biotechnology	4
ICBI 435	Molecular Techniques in Biotechnology	4
ICBI 436	Industrial Enzymology	4
ICBI 437	Current Issues in Biotechnology	2
ICBI 461	Cell Technology	4
ICCH 222	Organic Chemistry II	4
ICCH 200	Analytical Chemistry A	4
ICCH 201	Analytical Chemistry B	4

Uncategorized Major Elective Courses

The uncategorized Major Elective courses can be used (subject to approval by the Program Director of Biological Sciences) to fulfill any module.

ICBI 211	Genetics and Molecular Biology I	4
ICBI 355	Geographic Information Systems	2
ICBI 380	Introduction to Systems Biology and Bioinformatics	4
ICBI 464	Entrepreneurship and Innovation in Science	4
ICBI 465	Internship in Biological Sciences A	4
ICBI 466	Internship in Biological Sciences B	12
ICBI 471	Special Topics in Biological Sciences A	4
ICBI 472	Special Topics in Biological Sciences B	4
ICBI 473	Special Topics in Biological Sciences C	4
ICBI 474	Special Topics in Biological Sciences D	4
ICBI 475	Special Topics in Biological Sciences E	4
ICBI 481	Current Issues in Biological Sciences A	2
ICBI 482	Current Issues in Biological Sciences B	2
ICBI 483	Current Issues in Biological Sciences C	2
ICMA 213	Calculus II	4
ICPY 102	Physics II	4
ICPY 496	Biophysics	4

I-Design Elective Courses

20 credits

The purpose of the I-Design electives is to promote multidisciplinary learning. Students are encouraged to explore courses offered by diverse disciplines across MUIC, Mahidol University, and partner institutions. The I-Design electives can be satisfied upon the completion of the following course categories:

1. Minor courses offered by any program in MUIC
2. Certificate courses offered by any program in MUIC
3. Any major courses offered by any program in MUIC
4. Any major courses offered in Mahidol University (including undergraduate and graduate

level courses). Courses must be approved by the student's advisor and the Curriculum Administrative Committee.

5. Any major courses offered at partner institutions (who have MOU with Mahidol University and/or MUIC). Courses must be approved by the student's advisor and the Curriculum Administrative Committee.

Free Elective Courses

8 credits

Students can take any courses offered by MUIC and/or Mahidol University as free elective courses with the approval from the advisor. A course within the student's major that is too closely related or redundant to core/required/elective courses is discouraged and may be disapproved by an academic advisor.