

Doctor of Philosophy
Biological Science (International Program)
(2018)

1. **Degree Program** : Doctor of Philosophy Program in Biological Science (International Program)
ชื่อหลักสูตร : หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวภาพ (หลักสูตรนานาชาติ)

2. **Degree Offered** : Doctor of Philosophy (Biological Science)
: Ph.D. (Biological Science)
ชื่อปริญญา : ปรัชญาดุษฎีบัณฑิต (วิทยาศาสตร์ชีวภาพ)
: ปร.ด. (วิทยาศาสตร์ชีวภาพ)

3. Objectives

To produce Ph.D. graduates with the following characteristics:

1. Having thorough knowledge and deep understanding of important principles and theories in the areas of biological science and capable to efficiently apply the knowledge for performing research and work
2. Having initiative thinking and capable of doing research or academic projects to discover new knowledge or working procedures in biological science
3. Capable of systematic analysis and synthesis, solving problems by using scientific process, and having independent opinion and decision
4. Having leadership and doing highly efficient collaborative work
5. Capable of using computers and modern information technology to gain knowledge and for communications
6. Having ethics, morality and good conscience to use scientific knowledge for development of society within the country, AEC and the World, with awareness on conservation of environment and biological resources

4. Duration of the Program

- 3 academic years for Type 1.1 and 2.1,
- 4 academic years for Type 1.2 and 2.2

5. Program of study

Type 1.1

Required courses :	SC 029 990, SC 029 991, SC 029 992	3 (non-credit)
Dissertation :	SC 029 996	48
	Total	48

Type 1.2

Required courses :	SC 029 990, SC 029 991, SC 029 992, SC 029 993	4 (non-credit)
Dissertation :	SC 029 997	72
	Total	72

Type 2.1

Required courses :	SC 027 701, SC 029 990, SC 029 991, SC 029 992	6
Elective courses :	SC 029 994, SC 117 001, SC 117 002, SC 117 006, SC 117 101, SC 117 120, SC 117 128, SC 117 308, SC 117 309, SC 117 311, SC 117 314, SC 717 106, SC 717 202, SC 717 306, SC 717 502, SC 817 701, SC 817 702, SC 817 713, SC 817 715, SC 817 722, SC 817 724, SC 817 731, SC 817 735, SC 817 737, SC 917 702, SC 917 703, SC 917 704, SC 917 710, SC 917 711, SC 917 740, SC 917 742, SC 917 812, SC917 840, SC 917 842	6
Dissertation :	SC 029 998	36
	Total	48

Type 2.2

Required courses :	SC027 701, SC 029 990, SC 029 991, SC 029 992, SC 029 993	7
Elective courses :	SC 029 994, SC 117 001, SC 117 002, SC 117 006, SC 117 101, SC 117 120, SC 117 128, SC 117 308, SC 117 309, SC 117 311, SC 117 314, SC 717 106, SC 717 202, SC 717 306, SC 717 502, SC 817 701, SC 817 702, SC 817 713, SC 817 715, SC 817 722, SC 817 724, SC 817 731, SC 817 735, SC 817 737, SC 917 702, SC 917 703, SC 917 704, SC 917 710, SC 917 711, SC 917 740, SC 917 742, SC 917 812, SC917 840, SC 917 842	17
Dissertation :	SC 029 999	48
	Total	72

6. List of courses

Code	Name of course	Credit
SC 027 701	Integrated Biological Science	3(3-0-6)
SC 029 990	Seminar in Biological Science I	1(1-0-2)
SC 029 991	Seminar in Biological Science II	1(1-0-2)
SC 029 992	Seminar in Biological Science III	1(1-0-2)
SC 029 993	Seminar in Biological Science IV	1(1-0-2)
SC 029 994	Special Problem in Biological Science	3(0-9-4)
SC 029 996	Dissertation	48
SC 029 997	Dissertation	72
SC 029 998	Dissertation	36
SC 029 999	Dissertation	48
SC 117 001	Advanced Cell Biology	3(3-0-6)
SC 117 002	Bioinformatics and Information Technology	3(2-3-6)
SC 117 006	Systematic Classification of Organisms	3(3-0-6)
SC 117 101	Plant Metabolism	3(3-0-6)
SC 117 120	Modern Methods in Plant Taxonomy	3(2-3-6)
SC 117 128	Plant Molecular Biology	3(3-0-6)
SC 117 308	Histochemistry	3(1-6-4)
SC 117 309	Freshwater Biology	3(2-3-6)
SC 117 311	Freshwater Zooplankton	3(2-3-6)
SC 117 314	Biology of Amphibians	3(2-3-6)
SC 717 106	Advanced Microbial Physiology	2(2-0-4)
SC 717 202	Prokaryotic Molecular Genetics	2(2-0-4)
SC 717 306	Applied Microbiology and Biotechnology	2(2-0-4)
SC 717 502	Biodiversity of Microbial Ecosystems	3(3-0-6)
SC 817 701	Biochemistry for Graduate Study I	3(3-0-6)
SC 817 702	Biochemistry for Graduate Study II	3(3-0-6)
SC 817 713	Biochemical Techniques for Graduate Study	1(1-0-2)
SC 817 715	Advanced Biochemistry Techniques	1(1-0-2)
SC 817 722	Integrated Biochemistry	3(3-0-6)
SC 817 724	Advanced Genetic Engineering in Prokaryotic Cells	2(2-0-4)
SC 817 731	PCR Technology	2(2-0-4)
SC 817 735	Biochemistry and Biology of Cancer	3(3-0-6)
SC 817 737	Analysis and Presentation of Biological Science Articles	2(2-0-4)
SC 917 702	Ecological Principles and Natural Resource Conservation	3(3-0-6)
SC 917 703	Integrated Environmental Management	3(3-0-6)
SC 917 704	Integrated Environmental Management Laboratory	1(0-3-2)
SC 917 710	Forest Ecology	3(2-3-6)
SC 917 711	Community Ecology	3(3-0-6)
SC 917 740	Environmental Appraisal	3(2-3-6)
SC 917 742	Wastewater Biology	3(2-3-6)

SC 917 812	Ecological Economics and Sustainable Development	3(3-0-6)
SC 917 840	Hazardous Waste and Management	3(2-3-6)
SC 917 842	Environmental Nanotechnology	3(3-0-6)

7. Study Plan

7.1 Type 1.1 and 2.1

Year 1	Semester 1	Type 1.1	Type 2.1
XX xxx xxx	Elective Courses	-	6
SC 029 996	Dissertation	9	-
SC 027 701	Integrated Biological Science	-	3 (3-0-6)
	Total credits	9	9
	Cumulative credits	9	9
Year 1	Semester 2	Type 1.1	Type 2.1
SC 029 990	Seminar in Biological Science I	1(1-0-2) (non-credit)	1(1-0-2)
SC 029 996	Dissertation	9	-
SC 029 998	Dissertation	-	8
	Total credits	9	9
	Cumulative credits	18	18
Year 2	Semester 1	Type 1.1	Type 2.1
SC 029 991	Seminar in Biological Science II	1(1-0-2) (non-credit)	1(1-0-2)
SC 029 996	Dissertation	9	-
SC 029 998	Dissertation	-	8
	Total credits	9	9
	Cumulative credits	27	27
Year 2	Semester 2	Type 1.1	Type 2.1
SC 029 992	Seminar in Biological Science III	1(1-0-2) (non-credit)	1(1-0-2)
SC 029 996	Dissertation	9	-
SC 029 998	Dissertation	-	8
	Total credits	9	9
	Cumulative credits	36	36
Year 3	Semester 1	Type 1.1	Type 2.1
SC 029 996	Dissertation	9	-
SC 029 998	Dissertation	-	9
	Total credits	9	9

		Cumulative credits	45	45
Year 3		Semester 2	Type 1.1	Type 2.1
	SC 029 996	Dissertation	3	-
	SC 029 998	Dissertation	-	3
		Total credits	3	3
		Cumulative credits	48	48

7.2 Type 1.2 and 2.2

Year 1		Semester 1	Type 1.2	Type 2.2
	XX xxx xxx	Elective Courses	-	6
	SC 029 997	Dissertation	9	-
	SC 027 701	Integrated Biological Science	-	3(3-0-6)
		Total credits	9	9
		Cumulative credits	9	9
Year 1		Semester 2	Type 1.2	Type 2.2
	XX xxx xxx	Elective Courses	-	9
	SC 029 990	Seminar in Biological Science I	1(1-0-2) (non-credit)	1(1-0-2)
	SC029 997	Dissertation	10	-
		Total credits	10	10
		Cumulative credits	19	19
Year 2		Semester 1	Type 1.2	Type 2.2
	XX xxx xxx	Elective Courses	-	2
	SC 029 991	Seminar in Biological Science II	1(1-0-2) (non-credit)	1(1-0-2)
	SC 029 997	Dissertation	10	-
	SC 029 999	Dissertation	-	7
		Total credits	10	10
		Cumulative credits	29	29
Year 2		Semester 2	Type 1.2	Type 2.2
	SC 029 997	Dissertation	10	-
	SC 029 999	Dissertation	-	10
		Total credits	10	10
		Cumulative credits	39	39

Year 3	Semester 1		Type 1.2	Type 2.2
SC 029 992	Seminar in Biological Science III		1(1-0-2) (non-credit)	1(1-0-2)
SC 029 997	Dissertation		10	-
SC 029 999	Dissertation		-	9
Total credits			10	10
Cumulative credits			49	49
Year 3	Semester 2		Type 1.2	Type 2.2
SC 029 997	Dissertation		10	-
SC 029 999	Dissertation		-	10
Total credits			10	10
Cumulative credits			59	59
Year 4	Semester 1		Type 1.2	Type 2.2
SC029 993	Seminar in Biological Science IV		1(1-0-2) (non-credit)	1(1-0-2)
SC 029 997	Dissertation		10	-
SC 029 999	Dissertation		-	9
Total credits			10	10
Cumulative credits			69	69
Year 4	Semester 1		Type 1.2	Type 2.2
SC 029 997	Dissertation		3	-
SC 029 999	Dissertation		-	3
Total credits			3	3
Cumulative credits			72	72

8. Admission Requirements

8.1 Applicants must meet the qualifications as specified in each program as follows:

Type 1.1: Holding a Master Degree in Master of Science Program in Biology, Biochemistry, Microbiology, Environmental Science, Agricultural Sciences, Biological Sciences, Biotechnology or equivalent in related fields, and having GPA of at least 3.50 out of the maximum of 4.0, or have published scientific papers in national or international journals, or having at least three years work experience in research, or having enough knowledge/potential to do research work depending upon the consent of the curriculum administrative committee.

Type 1.2: Holding a Bachelor Degree in Program in Biology, Biochemistry, Microbiology, Environmental Science, Agricultural Sciences, Biological Sciences, Biotechnology or equivalent in related fields, and having GPA of at least 3.50 out of the maximum of 4.0, and have published scientific papers in national or international journals depending upon the consent of the curriculum administrative committee.

Type 2.1: Holding a Master Degree in Master of Science Program in Biology, Biochemistry, Microbiology, Environmental Science, Agricultural Sciences, Biological Sciences, Biotechnology or equivalent in related fields.

Type 2.2: Holding a Bachelor Degree in Program in Biology, Biochemistry, Microbiology, Environmental Science, Agricultural Sciences, Biological Sciences, Biotechnology or equivalent in related fields, and having GPA of at least 3.50 out of the maximum of 4.0, and having enough knowledge/potential to do research work depending upon the consent of the curriculum administrative committee.

8.2 Applicants from a country where English is not the first language must enclose English Proficiency Test Result. The result must not be more than two years. The following English Proficiency tests are accepted, and a minimum score should be as follows:

TOEFL (Paper Based)	500	or
TOEFL (Computer Based)	173	or
TOEFL (Internet Based)	61	or
IELTS (Academic Module)	5.5	or
TU-GET (1000)	550	or
CU-TEP (120)	70	or

Other English language test institutes with equivalent standards depending upon the consent of the curriculum administrative committee.