

Course Structure for Ph. D Program
Cellular and Molecular, Department of Life Science
National Taiwan Normal University

Adaptive to Class of	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
111	13.0	11.0	0.0	24.0

Note: The first alphabet "E" on the course name refers to the course in English as a medium of instruction

I. Required Courses: 0.0 credit is required

II. Elective Courses: 0.0 credit is required

III. Courses Offered to Students in Different Divisions

Required Course, 13.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC8007	1 Research Methods of Experimental Biology	2.0	2.0	0.0	
BIC0138	2 Cellular and Molecular Biology	3.0	3.0	0.0	
BID0165	3 Seminar	2.0	2.0	0.0	This course must be retaken with a passing score for 4 times

Elective Course: 11.0 credits are required

Direct Admission to Doctoral Program from Master's Program must Practice 17 credits

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
	1 Core Elective Curriculum 2 courses are least required				
BIC0139	1-1 Protein and Enzyme Chemistry	2.0	2.0	0.0	
BIC8016	1-2 Writing Scientific Papers in English	2.0	2.0	0.0	
BIC7009	1-3 Immunochemistry	3.0	3.0	0.0	
BIC0133	1-4 Topics in Molecular Biology	2.0	2.0	0.0	
BIC0173	2 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	3 E Advanced Ecology	3.0	3.0	0.0	
BIC8010	4 Research Methods in Ecology and Evolution	1.0	1.0	0.0	
BIC0011	5 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC7007	6 Population Genetics and Evolution	3.0	3.0	0.0	
BIC7012	7 Principles of Phylogenetics	3.0	3.0	0.0	
BIC8018	8 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIC7015	9 Comparative Animal Physiology	3.0	3.0	0.0	
BIC0119	10 Learning and memory	3.0	3.0	0.0	
BID0074	11 Topics in Sensory Physiology	3.0	3.0	0.0	
BIC0052	12 Neuropharmacology	3.0	3.0	0.0	
BIC8006	13 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC0017	14 Topics in Fish Physiology	3.0	3.0	0.0	
BID0069	15 Topics in principle of phylogenetics	3.0	3.0	0.0	
BID0072	16 Topics in Plant Growth and Development	2.0	2.0	0.0	
BID0075	17 Topics in Brain Physiology	3.0	3.0	0.0	
BIC0016	18 E Topics in Plant Molecular Biology	2.0	2.0	0.0	
BIC0021	19 Topics in Molecular Genetics	3.0	3.0	0.0	
BIC0023	20 Topics in Biochemistry	2.0	2.0	0.0	
BIC0029	21 Topics in Biosystematics	2.0	2.0	0.0	
BIC0038	22 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0059	23 Architecture of Brain	3.0	3.0	0.0	
BIC0061	24 Principles and Methods of Plant Taxonomy	2.0	2.0	0.0	
BIC0075	25 Biomathematics	3.0	3.0	0.0	
BIC0101	26 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0153	27 Regression Analysis	3.0	3.0	0.0	
BIC0185	28 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	29 Protein Engineering	3.0	3.0	0.0	
BIC7001	30 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC8003	31 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8012	32 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8015	33 Topics on Interaction between Marine Biology and Physical Oceanography	3.0	3.0	0.0	
BIC8020	34 Biotechnology for the Drug Development	2.0	2.0	0.0	
BIC7002	35 Industrial Practice	3.0	3.0	0.0	
BIC7003	36 Molecular Evolution	3.0	3.0	0.0	
BIC7004	37 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC7005	38 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7010	39 Neuroethology	3.0	3.0	0.0	
BIC7011	40 Developmental Neurobiology	3.0	3.0	0.0	
BIC7013	41 Plant Ecology	3.0	3.0	0.0	
BIC7014	42 Conservation Genetics	3.0	3.0	0.0	
BIC8021	43 Experimental Physiology	2.0	2.0	0.0	
BIC8022	44 E Behavioral Ecology	3.0	3.0	0.0	
BIC8009	45 Advanced Seminar (I)	0.0	0.0	0.0	
BIC8014	46 Advanced Seminar (II)	0.0	0.0	0.0	
BID0166	47 Issues and Rationale of Biological Education	3.0	3.0	0.0	
BIC8023	48 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC8027	49 E Topics in Virology	2.0	2.0	0.0	
BIC8025	50 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8029	51 E Laboratory Rotations in Cell and Molecular Biology	3.0	3.0	0.0	
BIC8026	52 E Linear and Logistic Regression Models	3.0	3.0	0.0	
BIC8028	53 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	

IV. Free Elective Credits: 0.0 credit is required