

Course Structure for M.A. 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	9.0	15.0	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, 9.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC0138	1 Cellular and Molecular Biology	3.0	3.0	0.0	
BIC8007	2 Research Methods of Experimental Biology	2.0	2.0	0.0	
BIC8009	3 Advanced Seminar (I)	0.0	0.0	0.0	the course should be not necessary for those student that graduated in the 2nd semester
BIC8014	4 Advanced Seminar (II)	0.0	0.0	0.0	the course should be not necessary for those student that graduated in the 3rd semester
BIM0123	5 Seminar	2.0	2.0	0.0	This course must be retaken with a passing score for 2 times

Elective Course: 15.0 credits are required

Students can choose to take up to 8 credits outside the school with the guidance of a professor.

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
1 Core Elective Curriculum 2 courses are least required					
BIC0123	1-1 Developmental Biology	3.0	3.0	0.0	
BIC9006	1-2 Stem Cell Biology	3.0	3.0	0.0	
BIC0139	1-3 Protein and Enzyme Chemistry	2.0	2.0	0.0	
BIC0177	1-4 Biotechnology	3.0	3.0	0.0	
BIC0001	1-5 Neurobiology	3.0	3.0	0.0	
BIC0133	1-6 Topics in Molecular Biology	2.0	2.0	0.0	
BIC9040	1-7 Signal Transduction	3.0	3.0	0.0	
BIC0006	2 Biological Geography	3.0	3.0	0.0	
BIC0084	3 Animal Behaviour	3.0	3.0	0.0	
BIC0085	4 Marine Biology	2.0	2.0	0.0	
BIC0086	5 Ornithology	3.0	3.0	0.0	
BIC0087	6 Herpetology	2.0	2.0	0.0	
BIC0088	7 Recreation Ecology	3.0	3.0	0.0	
BIC0108	8 Marine Ecology	2.0	2.0	0.0	
BIC0111	9 Respiratory and Circulatory Physiology	2.0	2.0	0.0	
BIC0170	10 E Forest Ecology	3.0	3.0	0.0	
BIC0175	11 Biological Invasions	3.0	3.0	0.0	
BIC9008	12 E Landscape Ecology	3.0	3.0	0.0	
BIC9009	13 Plant Genetic Engineering	3.0	3.0	0.0	
BIC9011	14 Bioindustry	2.0	2.0	0.0	
BIC9013	15 Program Language in Bioinformatics	3.0	3.0	0.0	
BIC9014	16 Algorithms in Bioinformatics	3.0	3.0	0.0	
BIC9015	17 Biological Microtechnique (including Lab.)	3.0	2.0	2.0	
BIC9021	18 E Wildlife Biology	3.0	3.0	0.0	
BIC9024	19 Principles of Systematic Biology	3.0	3.0	0.0	
BIC9025	20 Island Biogeography	3.0	3.0	0.0	
BIC9027	21 Concept and Experimental Learning of Plant Factory	2.0	1.0	2.0	
BIC9028	22 Translational Application of Stem Cell	1.0	1.0	0.0	
BIC9029	23 Translational Application of Stem Cell Experiment	1.0	0.0	3.0	
BIC9030	24 Biodiesel Biotechnology	1.0	1.0	0.0	
BIC9031	25 Biodiesel Biotechnology Experiment	1.0	0.0	3.0	
BIC9032	26 Cancer Biology	2.0	2.0	0.0	
BIC9033	27 Reactive Oxygen Species and Biological Medicine	1.0	1.0	0.0	
BIC9034	28 Methods for Reactive Oxygen Species Measurement	1.0	0.0	3.0	
BIC9035	29 Data Analysis for Ecology and Evolution in R Programming Language	3.0	3.0	0.0	
BIC9036	30 Ecological Plant Physiology	3.0	3.0	0.0	
BIC9037	31 Conservation Biology	3.0	3.0	0.0	
BIC9038	32 Disease Ecology	3.0	3.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC9062	33 Plant Cell and Tissue Culture	3.0	3.0	0.0	
BIC0016	34 E Topics in Plant Molecular Biology	2.0	2.0	0.0	
BIC0017	35 Topics in Fish Physiology	3.0	3.0	0.0	
BIC0021	36 Topics in Molecular Genetics	3.0	3.0	0.0	
BIC0023	37 Topics in Biochemistry	2.0	2.0	0.0	
BIC0029	38 Topics in Biosystematics	2.0	2.0	0.0	
BIC0038	39 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0052	40 Neuropharmacology	3.0	3.0	0.0	
BIC0059	41 Architecture of Brain	3.0	3.0	0.0	
BIC0061	42 Principles and Methods of Plant Taxonomy	2.0	2.0	0.0	
BIC0075	43 Biomathematics	3.0	3.0	0.0	
BIC9054	44 Ecophysiology	3.0	3.0	0.0	
BIC0101	45 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0153	46 Regression Analysis	3.0	3.0	0.0	
BIC0185	47 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	48 Protein Engineering	3.0	3.0	0.0	
BIC8003	49 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8006	50 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC8015	51 Topics on Interaction between Marine Biology and Physical Oceanography	3.0	3.0	0.0	
BIC8016	52 Writing Scientific Papers in English	2.0	2.0	0.0	
BIC8018	53 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIC8020	54 Biotechnology for the Drug Development	2.0	2.0	0.0	
BIC7001	55 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC7002	56 Industrial Practice	3.0	3.0	0.0	
BIC7003	57 Molecular Evolution	3.0	3.0	0.0	
BIC7004	58 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	
BIC7005	59 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7009	60 Immunochemistry	3.0	3.0	0.0	
BIC7010	61 Neuroethology	3.0	3.0	0.0	
BIC7011	62 Developmental Neurobiology	3.0	3.0	0.0	
BIC7013	63 Plant Ecology	3.0	3.0	0.0	
BIC7014	64 Conservation Genetics	3.0	3.0	0.0	
BIC0173	65 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	66 E Advanced Ecology	3.0	3.0	0.0	
BIC7007	67 Population Genetics and Evolution	3.0	3.0	0.0	
BIC8010	68 Research Methods in Ecology and Evolution	1.0	1.0	0.0	
BIC0011	69 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC7012	70 Principles of Phylogenetics	3.0	3.0	0.0	
BIM0124	71 Modern Physiology	3.0	3.0	0.0	
BIC9022	72 Endocrinology	3.0	3.0	0.0	
BIC7015	73 Comparative Animal Physiology	3.0	3.0	0.0	
BIC0119	74 Learning and memory	3.0	3.0	0.0	
BIC8012	75 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8022	76 E Behavioral Ecology	3.0	3.0	0.0	
BIC8021	77 Experimental Physiology	2.0	2.0	0.0	
BIC9041	78 Environmental Physiology	3.0	3.0	0.0	
BIC9042	79 Transgenic	2.0	2.0	0.0	
BIC9045	80 Inquiry and Practice in Biology	2.0	2.0	0.0	
BPM0002	81 Studies in Biotech- Pharmaceutical Industry	2.0	2.0	0.0	
BPM0003	82 Biotech Product Development and Intellectual Property Management	3.0	3.0	0.0	
BPM0004	83 Research and Design Management in Bioindustry	3.0	3.0	0.0	
BPM0009	84 Translational Medicine	2.0	2.0	0.0	
BIC9044	85 Virology	2.0	2.0	0.0	
BIC9047	86 Cross-Domain Learning Chinese Medicine and Health	2.0	2.0	0.0	
BIC9046	87 Curriculum Design for Scientific Inquiry and Practices	2.0	2.0	0.0	
BIC9050	88 Plant Anatomy with Experiment	3.0	2.0	2.0	
BIC9049	89 Overview of Biomedical Development and Commercialization	2.0	2.0	0.0	
BIC9048	90 The Application of Biotechnological Advances on Complement for Clinical Practice	2.0	2.0	0.0	
BIC9051	91 Mammalogy	2.0	2.0	0.0	
BIC9053	92 Biomethodology of Cancer Research	3.0	3.0	0.0	
BIC9052	93 The Latest Modern Issues in Biomedical Research and Technology	2.0	2.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC9055	94 Evolution of Insects	3.0	3.0	0.0	
BIC8023	95 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC9056	96 E Introduction in Virology	2.0	2.0	0.0	
BIC9057	97 E Histology	2.0	2.0	0.0	
BIC9058	98 Basic and Applied Bone Biology	2.0	2.0	0.0	
BIC9060	99 Pteridology	3.0	3.0	0.0	
BIC9059	100 Plant Pathology	3.0	3.0	0.0	
BIC8027	101 E Topics in Virology	2.0	2.0	0.0	
BIC8025	102 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8029	103 E Laboratory Rotations in Cell and Molecular Biology	3.0	3.0	0.0	
BIC8026	104 E Linear and Logistic Regression Models	3.0	3.0	0.0	
BIC8028	105 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	
BIM0125	106 E Ecoacoustics: Principle and Application	2.0	2.0	0.0	
BIM0126	107 E Knowledge Transformation and Dissemination for Life Science	2.0	2.0	0.0	

IV. Free Elective Credits: 0.0 credit is required