

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
112	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	3.0	3.0	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	

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BIC9062	33 E 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	
BIC0038	37 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0052	38 Neuropharmacology	3.0	3.0	0.0	
BIC0059	39 Architecture of Brain	3.0	3.0	0.0	
BIC0061	40 Principles and Methods of Plant Taxonomy	3.0	3.0	0.0	
BIC9054	41 Ecophysiology	3.0	3.0	0.0	
BIC0101	42 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0153	43 Regression Analysis	3.0	3.0	0.0	
BIC0185	44 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	45 Protein Engineering	3.0	3.0	0.0	
BIC8003	46 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8006	47 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC8016	48 Writing Scientific Papers in English	3.0	3.0	0.0	
BIC8018	49 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIC8020	50 Biotechnology for the Drug Development	2.0	2.0	0.0	
BIC7001	51 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC7002	52 Industrial Practice	3.0	3.0	0.0	
BIC7003	53 Molecular Evolution	3.0	3.0	0.0	
BIC7004	54 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	
BIC7005	55 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7009	56 Immunochemistry	3.0	3.0	0.0	
BIC7010	57 Neuroethology	3.0	3.0	0.0	
BIC0173	58 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	59 E Advanced Ecology	3.0	3.0	0.0	
BIC7007	60 Population Genetics and Evolution	3.0	3.0	0.0	
BIC8010	61 Research Methods in Ecology and Evolution	1.0	1.0	0.0	
BIC0011	62 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC7012	63 Principles of Phylogenetics	3.0	3.0	0.0	
BIM0124	64 Modern Physiology	3.0	3.0	0.0	
BIC9022	65 Endocrinology	3.0	3.0	0.0	
BIC7015	66 Comparative Animal Physiology	3.0	3.0	0.0	
BIC0119	67 Learning and memory	3.0	3.0	0.0	
BIC8012	68 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8022	69 E Behavioral Ecology	3.0	3.0	0.0	
BIC8021	70 Experimental Physiology	2.0	2.0	0.0	
BIC9041	71 Environmental Physiology	3.0	3.0	0.0	
BIC9042	72 Transgenic	2.0	2.0	0.0	
BIC9045	73 Inquiry and Practice in Biology	2.0	2.0	0.0	
BPM0002	74 Studies in Biotech- Pharmaceutical Industry	2.0	2.0	0.0	
BPM0003	75 Biotech Product Development and Intellectual Property Management	3.0	3.0	0.0	
BPM0004	76 Research and Design Management in Bioindustry	3.0	3.0	0.0	
BPM0009	77 Translational Medicine	2.0	2.0	0.0	
BIC9044	78 Virology	2.0	2.0	0.0	
BIC9047	79 Cross-Domain Learning Chinese Medicine and Health	2.0	2.0	0.0	
BIC9046	80 Curriculum Design for Scientific Inquiry and Practices	2.0	2.0	0.0	
BIC9050	81 Plant Anatomy with Experiment	3.0	2.0	2.0	
BIC9049	82 Overview of Biomedical Development and Commercialization	2.0	2.0	0.0	
BIC9048	83 The Application of Biotechnological Advances on Complement for Clinical Practice	2.0	2.0	0.0	
BIC9051	84 Mammalogy	2.0	2.0	0.0	
BIC9053	85 Biomethology of Cancer Research	3.0	3.0	0.0	
BIC9052	86 The Latest Modern Issues in Biomedical Research and Technology	2.0	2.0	0.0	
BIC9055	87 Evolution of Insects	3.0	3.0	0.0	
BIC8023	88 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC9056	89 E Introduction in Virology	2.0	2.0	0.0	
BIC9057	90 E Histology	2.0	2.0	0.0	
BIC9058	91 Basic and Applied Bone Biology	2.0	2.0	0.0	
BIC9060	92 Pteridology	3.0	3.0	0.0	
BIC9059	93 Plant Pathology	3.0	3.0	0.0	

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BIC8027	94 E Topics in Virology	2.0	2.0	0.0	
BIC8025	95 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8029	96 E Laboratory Rotations in Cell and Molecular Biology	3.0	3.0	0.0	
BIC8026	97 E Linear and Logistic Regression Models	3.0	3.0	0.0	
BIC8028	98 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	
BIM0125	99 E Ecoacoustics: Principle and Application	2.0	2.0	0.0	
BIM0126	100 E Knowledge Transformation and Dissemination for Life Science	2.0	2.0	0.0	
OEC8155	101 E Bio-Chips Manufacturing Technology	3.0	3.0	0.0	
BIC9063	102 E Plant Molecular Biology	2.0	2.0	0.0	
BIC9061	103 E Oncology Journal Reading and Discussion	2.0	2.0	0.0	

IV. Free Elective Credits: 0.0 credit is required