

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
114	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	This course must be retaken with a passing score for 2 times Group in Cellular and Molecular Students must choose this course four times, but it just count two times credits.
BIC8007	2 Research Methods of Experimental Biology	2.0	2.0	0.0	
BIM0123	3 Seminar	2.0	2.0	0.0	

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	
BIC9062	31 E Plant Cell and Tissue Culture	3.0	3.0	0.0	
BIC0016	32 E Topics in Plant Molecular Biology	2.0	2.0	0.0	
BIC0017	33 Topics in Fish Physiology	3.0	3.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC0021	34 Topics in Molecular Genetics	3.0	3.0	0.0	
BIC0038	35 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0052	36 Neuropharmacology	3.0	3.0	0.0	
BIC0059	37 Architecture of Brain	3.0	3.0	0.0	
BIC0061	38 E Principles and Methods of Plant Taxonomy	3.0	3.0	0.0	
BIC9054	39 Ecophysiology	3.0	3.0	0.0	
BIC0101	40 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0153	41 Regression Analysis	3.0	3.0	0.0	
BIC0185	42 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	43 Protein Engineering	3.0	3.0	0.0	
BIC8003	44 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8006	45 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC8016	46 Writing Scientific Papers in English	3.0	3.0	0.0	
BIC8018	47 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIC8020	48 Biotechnology for the Drug Development	2.0	2.0	0.0	
BIC7001	49 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC7002	50 Industrial Practice	3.0	3.0	0.0	
BIC7004	51 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	
BIC7005	52 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7009	53 Immunochemistry	3.0	3.0	0.0	
BIC7010	54 Neuroethology	3.0	3.0	0.0	
BIC0173	55 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	56 E Advanced Ecology	3.0	3.0	0.0	
BIC7007	57 Population Genetics and Evolution	3.0	3.0	0.0	
BIC8010	58 Research Methods in Ecology and Evolution	2.0	2.0	0.0	
BIC0011	59 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC7012	60 Principles of Phylogenetics	3.0	3.0	0.0	
BIM0124	61 Modern Physiology	3.0	3.0	0.0	
BIC9022	62 Endocrinology	3.0	3.0	0.0	
BIC7015	63 Comparative Animal Physiology	3.0	3.0	0.0	
BIC0119	64 Learning and memory	3.0	3.0	0.0	
BIC8012	65 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8022	66 E Behavioral Ecology	3.0	3.0	0.0	
BIC8021	67 Experimental Physiology	2.0	2.0	0.0	
BIC9041	68 Environmental Physiology	3.0	3.0	0.0	
BIC9042	69 Transgenic	2.0	2.0	0.0	
BIC9045	70 Inquiry and Practice in Biology	2.0	2.0	0.0	
BPM0002	71 Studies in Biotech- Pharmaceutical Industry	2.0	2.0	0.0	
BPM0003	72 Biotech Product Development and Intellectual Property Management	3.0	3.0	0.0	
BPM0004	73 Research and Design Management in Bioindustry	3.0	3.0	0.0	
BPM0009	74 Translational Medicine	2.0	2.0	0.0	
BIC9044	75 Virology	2.0	2.0	0.0	
BIC9047	76 Cross-Domain Learning Chinese Medicine and Health	2.0	2.0	0.0	
BIC9046	77 Curriculum Design for Scientific Inquiry and Practices	2.0	2.0	0.0	
BIC9050	78 Plant Anatomy with Experiment	3.0	2.0	2.0	
BIC9049	79 Overview of Biomedical Development and Commercialization	2.0	2.0	0.0	
BIC9048	80 The Application of Biotechnological Advances on Complement for Clinical Practice	2.0	2.0	0.0	
BIC9051	81 Mammalogy	2.0	2.0	0.0	
BIC9053	82 Biomethology of Cancer Research	3.0	3.0	0.0	
BIC9052	83 The Latest Modern Issues in Biomedical Research and Technology	2.0	2.0	0.0	
BIC9055	84 Evolution of Insects	3.0	3.0	0.0	
BIC8023	85 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC9056	86 E Introduction in Virology	2.0	2.0	0.0	
BIC9057	87 E Histology	2.0	2.0	0.0	
BIC9058	88 Basic and Applied Bone Biology	2.0	2.0	0.0	
BIC9060	89 Pteridology	3.0	3.0	0.0	
BIC9059	90 Plant Pathology	3.0	3.0	0.0	
BIC8027	91 E Topics in Virology	2.0	2.0	0.0	
BIC8025	92 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8030	93 E Comprehensive Biotech Practice-From Micro Molecular Biology to Macro Physiology	3.0	3.0	0.0	
BIC8026	94 E Linear and Logistic Regression Models	3.0	3.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC8028	95 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	
BIM0125	96 E Ecoacoustics: Principle and Application	2.0	2.0	0.0	
BIM0126	97 E Knowledge Transformation and Dissemination for Life Science	2.0	2.0	0.0	
OEC8155	98 E Bio-Chips Manufacturing Technology	3.0	3.0	0.0	
BIC9063	99 E Plant Molecular Biology	2.0	2.0	0.0	
BIC9061	100 Oncology Journal Reading and Discussion	2.0	2.0	0.0	
BIC9065	101 E Introduction to Biomaterials	3.0	3.0	0.0	
BIC9064	102 Introduction to Biomedical Engineering	3.0	3.0	0.0	
BIC9066	103 Field Ecology Survey Techniques	3.0	3.0	0.0	
BIC9067	104 Internship in Ecological Industry	3.0	0.0	6.0	
BIC9068	105 Field ecology	3.0	3.0	0.0	
BIC8031	106 Special Topics in Brain Neurobehavioral Studies	3.0	3.0	0.0	

IV. Free Elective Credits: 0.0 credit is required