

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
115	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	
BIC9032	1-8 Cancer Biology	2.0	2.0	0.0	
BIC9059	1-9 Plant Pathology	3.0	3.0	0.0	
BIC9062	1-10 E Plant Cell and Tissue Culture	3.0	3.0	0.0	
BIC9064	1-11 Introduction to Biomedical Engineering	3.0	3.0	0.0	
BIC9065	1-12 E Introduction to Biomaterials	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	
BIC0111	8 Respiratory and Circulatory Physiology	2.0	2.0	0.0	
BIC0170	9 E Forest Ecology	3.0	3.0	0.0	
BIC0175	10 Biological Invasions	3.0	3.0	0.0	
BIC9008	11 E Landscape Ecology	3.0	3.0	0.0	
BIC9009	12 E Plant Genetic Engineering	3.0	3.0	0.0	
BIC9011	13 Bioindustry	2.0	2.0	0.0	
BIC9013	14 Program Language in Bioinformatics	3.0	3.0	0.0	
BIC9014	15 Algorithms in Bioinformatics	3.0	3.0	0.0	
BIC9015	16 Biological Microtechnique (including Lab.)	3.0	2.0	2.0	
BIC9021	17 E Wildlife Biology	3.0	3.0	0.0	
BIC9024	18 Principles of Systematic Biology	3.0	3.0	0.0	
BIC9025	19 Island Biogeography	3.0	3.0	0.0	
BIC9027	20 Concept and Experimental Learning of Plant Factory	2.0	1.0	2.0	
BIC9032	21 Cancer Biology	2.0	2.0	0.0	
BIC9035	22 Data Analysis for Ecology and Evolution in R Programming Language	3.0	3.0	0.0	
BIC9062	23 E Plant Cell and Tissue Culture	3.0	3.0	0.0	
BIC0016	24 E Topics in Plant Molecular Biology	2.0	2.0	0.0	
BIC0017	25 Topics in Fish Physiology	3.0	3.0	0.0	
BIC0021	26 Topics in Molecular Genetics	3.0	3.0	0.0	
BIC0038	27 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0052	28 Neuropharmacology	3.0	3.0	0.0	

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BIC0059	29 Architecture of Brain	3.0	3.0	0.0	
BIC0061	30 E Principles and Methods of Plant Taxonomy	3.0	3.0	0.0	
BIC9054	31 Ecophysiology	3.0	3.0	0.0	
BIC0101	32 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0153	33 Regression Analysis	3.0	3.0	0.0	
BIC0185	34 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	35 Protein Engineering	3.0	3.0	0.0	
BIC8003	36 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8006	37 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC8016	38 Writing Scientific Papers in English	3.0	3.0	0.0	
BIC8018	39 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIC7001	40 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC7002	41 Industrial Practice	3.0	3.0	0.0	
BIC7004	42 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	
BIC7005	43 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7009	44 Immunochemistry	3.0	3.0	0.0	
BIC7010	45 Neuroethology	3.0	3.0	0.0	
BIC0173	46 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	47 E Advanced Ecology	3.0	3.0	0.0	
BIC7007	48 Population Genetics and Evolution	3.0	3.0	0.0	
BIC8010	49 Research Methods in Ecology and Evolution	2.0	2.0	0.0	
BIC0011	50 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC7012	51 Principles of Phylogenetics	3.0	3.0	0.0	
BIM0124	52 Modern Physiology	3.0	3.0	0.0	
BIC9022	53 Endocrinology	3.0	3.0	0.0	
BIC7015	54 Comparative Animal Physiology	3.0	3.0	0.0	
BIC0119	55 Learning and memory	3.0	3.0	0.0	
BIC8012	56 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8022	57 E Behavioral Ecology	3.0	3.0	0.0	
BIC8021	58 Experimental Physiology	2.0	2.0	0.0	
BIC9041	59 Environmental Physiology	3.0	3.0	0.0	
BIC9042	60 Transgenic	2.0	2.0	0.0	
BIC9045	61 Inquiry and Practice in Biology	2.0	2.0	0.0	
BPM0002	62 Studies in Biotech- Pharmaceutical Industry	2.0	2.0	0.0	
BPM0003	63 Biotech Product Development and Intellectual Property Management	3.0	3.0	0.0	
BPM0004	64 Research and Design Management in Bioindustry	3.0	3.0	0.0	
BPM0009	65 Translational Medicine	2.0	2.0	0.0	
BIC9044	66 Virology	2.0	2.0	0.0	
BIC9047	67 Cross-Domain Learning Chinese Medicine and Health	2.0	2.0	0.0	
BIC9046	68 Curriculum Design for Scientific Inquiry and Practices	2.0	2.0	0.0	
BIC9050	69 Plant Anatomy with Experiment	3.0	2.0	2.0	
BIC9049	70 Overview of Biomedical Development and Commercialization	2.0	2.0	0.0	
BIC9048	71 The Application of Biotechnological Advances on Complement for Clinical Practice	2.0	2.0	0.0	
BIC9051	72 Mammalogy	2.0	2.0	0.0	
BIC9053	73 Biomethology of Cancer Research	3.0	3.0	0.0	
BIC9052	74 The Latest Modern Issues in Biomedical Research and Technology	2.0	2.0	0.0	
BIC9055	75 Evolution of Insects	3.0	3.0	0.0	
BIC8023	76 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC9056	77 E Introduction in Virology	2.0	2.0	0.0	
BIC9057	78 E Histology	2.0	2.0	0.0	
BIC9058	79 Basic and Applied Bone Biology	2.0	2.0	0.0	
BIC9060	80 Pteridology	3.0	3.0	0.0	
BIC9059	81 Plant Pathology	3.0	3.0	0.0	
BIC8027	82 E Topics in Virology	2.0	2.0	0.0	
BIC8025	83 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8030	84 E Comprehensive Biotech Practice-From Micro Molecular Biology to Macro Physiology	3.0	3.0	0.0	
BIC8026	85 E Linear and Logistic Regression Models	3.0	3.0	0.0	
BIC8028	86 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	
BIM0125	87 E Ecoacoustics: Principle and Application	2.0	2.0	0.0	
BIM0126	88 E Knowledge Transformation and Dissemination for Life Science	2.0	2.0	0.0	

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			Lecture Hour	Lab/Practice Hour	
0EC8155	89 E Bio-Chips Manufacturing Technology	3.0	3.0	0.0	
BIC9063	90 E Plant Molecular Biology	2.0	2.0	0.0	
BIC9061	91 E Oncology Journal Reading and Discussion	2.0	2.0	0.0	
BIC9065	92 E Introduction to Biomaterials	3.0	3.0	0.0	
BIC9064	93 Introduction to Biomedical Engineering	3.0	3.0	0.0	
BIC9066	94 Field Ecology Survey Techniques	3.0	3.0	0.0	
BIC9067	95 Internship in Ecological Industry	3.0	0.0	6.0	
BIC9068	96 Field ecology	3.0	3.0	0.0	
BIC8031	97 Special Topics in Brain Neurobehavioral Studies	3.0	3.0	0.0	
BIC9071	98 Marine Ecosystem	2.0	2.0	0.0	
BIC9070	99 Forest Ecophysiology	3.0	3.0	0.0	
BIC9069	100 Natural Carbon Sink Analysis	3.0	3.0	0.0	
BIC9074	101 E Wildlife Management	3.0	3.0	0.0	
BIC9072	102 E Remote Sensing in Vegetation Ecology	2.0	2.0	0.0	
BIC9073	103 E Introduction to Biostatistics	3.0	3.0	0.0	
BIC9075	104 Laboratory for Biological Inquiry and Practices	1.0	0.0	2.0	
BIC9076	105 Laboratory in Curriculum Design for Scientific Inquiry and Practices	1.0	0.0	2.0	
BIC8032	106 Regulatory and Verification Mechanism Analysis for Nature-Based Carbon Sinks	3.0	3.0	0.0	

IV. Free Elective Credits: 0.0 credit is required