

**Course Structure for M.A. Program**  
**Graduate Program of Biotechnology and Pharmaceutical Industries**  
**National Taiwan Normal University**

Adaptive to Class of	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
111	12.0	12.0	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: 12.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
BPM0001	1 Seminar	2.0	2.0	0.0	This course must be retaken with a passing score for 2 times
BPM0002	2 Studies in Biotech- Pharmaceutical Industry	2.0	2.0	0.0	
BPM0003	3 Biotech Product Development and Intellectual Property Management	3.0	3.0	0.0	
BPM0004	4 Research and Design Management in Bioindustry	3.0	3.0	0.0	

### II. Elective Courses: 12.0 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	
BPM0005	1 Topics on Biotech- Pharmaceutical Industry	3.0	3.0	0.0	
BPM0006	2 Internship in Domestic Biotech- Pharmaceutical Industry	3.0	0.0	6.0	
BPM0007	3 Pharmaceutical Industry Aspects on Chinese and Western Medicine	3.0	3.0	0.0	
BPM0008	4 Internship in Overseas Biotech- Pharmaceutical Industry	3.0	0.0	6.0	
BPM0009	5 Translational Medicine	2.0	2.0	0.0	
BIC0139	6 Protein and Enzyme Chemistry	2.0	2.0	0.0	
BIC9027	7 Concept and Experimental Learning of Plant Factory	2.0	1.0	2.0	
NSM0013	8 Topics in Functional Foods	3.0	3.0	0.0	
BIC7002	9 Industrial Practice	3.0	3.0	0.0	
BIC7001	10 Special Topics on Intellectual Property	2.0	2.0	0.0	
BIC8007	11 Research Methods of Experimental Biology	2.0	2.0	0.0	
BIC0138	12 Cellular and Molecular Biology	3.0	3.0	0.0	
BIC8021	13 Experimental Physiology	2.0	2.0	0.0	
BIC0052	14 Neuropharmacology	3.0	3.0	0.0	
BPM0012	15 Application of Analytic Instruments in Biomedical Industry	2.0	2.0	0.0	
BIC0173	16 Evolutionary Biology	3.0	3.0	0.0	
BIC0174	17 E Advanced Ecology	3.0	3.0	0.0	
BIC8018	18 Topics on Animal Physiology (I)	2.0	2.0	0.0	
BIM0124	19 Modern Physiology	3.0	3.0	0.0	
BIC9060	20 Pteridology	3.0	3.0	0.0	
BIC9059	21 Plant Pathology	3.0	3.0	0.0	
BIC8027	22 E Topics in Virology	2.0	2.0	0.0	
BIC8025	23 E Introduction to Statistical Analysis	3.0	3.0	0.0	
BIC8029	24 E Laboratory Rotations in Cell and Molecular Biology	3.0	3.0	0.0	
BIC8026	25 E Linear and Logistic Regression Models	3.0	3.0	0.0	
BIC8028	26 E Apply Sciences Lead to Biotechnology Industry	2.0	2.0	0.0	
BIC0001	27 Neurobiology	3.0	3.0	0.0	
BIC0006	28 Biological Geography	3.0	3.0	0.0	
BIC0011	29 Experimental Design and Data Analysis	3.0	3.0	0.0	
BIC0016	30 E Topics in Plant Molecular Biology	2.0	2.0	0.0	
BIC0017	31 Topics in Fish Physiology	3.0	3.0	0.0	
BIC0021	32 Topics in Molecular Genetics	3.0	3.0	0.0	
BIC0023	33 Topics in Biochemistry	2.0	2.0	0.0	
BIC0029	34 Topics in Biosystematics	2.0	2.0	0.0	
BIC0038	35 Studies in Adaptation and Natural Selection	2.0	2.0	0.0	
BIC0059	36 Architecture of Brain	3.0	3.0	0.0	
BIC0061	37 Principles and Methods of Plant Taxonomy	2.0	2.0	0.0	
BIC0075	38 Biomathematics	3.0	3.0	0.0	
BIC0084	39 Animal Behaviour	3.0	3.0	0.0	
BIC0085	40 Marine Biology	2.0	2.0	0.0	

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BIC0086	41 Ornithology	3.0	3.0	0.0	
BIC0087	42 Herpetology	2.0	2.0	0.0	
BIC0088	43 Recreation Ecology	3.0	3.0	0.0	
BIC0101	44 Paper Writing and Presentation in Biological Science	2.0	2.0	0.0	
BIC0108	45 Marine Ecology	2.0	2.0	0.0	
BIC0111	46 Respiratory and Circulatory Physiology	2.0	2.0	0.0	
BIC0119	47 Learning and memory	3.0	3.0	0.0	
BIC0123	48 Developmental Biology	3.0	3.0	0.0	
BIC0133	49 Topics in Molecular Biology	2.0	2.0	0.0	
BIC0153	50 Regression Analysis	3.0	3.0	0.0	
BIC0170	51 E Forest Ecology	3.0	3.0	0.0	
BIC0175	52 Biological Invasions	3.0	3.0	0.0	
BIC0177	53 Biotechnology	3.0	3.0	0.0	
BIC0185	54 Adaptation and Natural Selection	3.0	3.0	0.0	
BIC0186	55 Protein Engineering	3.0	3.0	0.0	
BIC7003	56 Molecular Evolution	3.0	3.0	0.0	
BIC7004	57 Translational Medicine — Novel Compounds and Chinese Herbal Medicines	2.0	2.0	0.0	
BIC7005	58 E Drug Development and Translational Medicine	2.0	2.0	0.0	
BIC7007	59 Population Genetics and Evolution	3.0	3.0	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	
BIC7012	63 Principles of Phylogenetics	3.0	3.0	0.0	
BIC7013	64 Plant Ecology	3.0	3.0	0.0	
BIC7014	65 Conservation Genetics	3.0	3.0	0.0	
BIC7015	66 Comparative Animal Physiology	3.0	3.0	0.0	
BIC8003	67 Ecology and Evolution of Amphibians and Reptiles	2.0	2.0	0.0	
BIC8006	68 Topics on Animal Physiology (II)	2.0	2.0	0.0	
BIC8010	69 Research Methods in Ecology and Evolution	1.0	1.0	0.0	
BIC8012	70 Oxidative Stress Physiology	3.0	3.0	0.0	
BIC8015	71 Topics on Interaction between Marine Biology and Physical Oceanography	3.0	3.0	0.0	
BIC8016	72 Writing Scientific Papers in English	2.0	2.0	0.0	
BIC8020	73 Biotechnology for the Drug Development	2.0	2.0	0.0	
BIC8022	74 E Behavioral Ecology	3.0	3.0	0.0	
BIC8023	75 Application of Optoelectronic Technology in Biomedical	2.0	2.0	0.0	
BIC9006	76 Stem Cell Biology	3.0	3.0	0.0	
BIC9008	77 E Landscape Ecology	3.0	3.0	0.0	
BIC9009	78 Plant Genetic Engineering	3.0	3.0	0.0	
BIC9011	79 Bioindustry	2.0	2.0	0.0	
BIC9013	80 Program Language in Bioinformatics	3.0	3.0	0.0	
BIC9014	81 Algorithms in Bioinformatics	3.0	3.0	0.0	
BIC9015	82 Biological Microtechnique (including Lab.)	3.0	2.0	2.0	
BIC9021	83 E Wildlife Biology	3.0	3.0	0.0	
BIC9022	84 Endocrinology	3.0	3.0	0.0	
BIC9024	85 Principles of Systematic Biology	3.0	3.0	0.0	
BIC9025	86 Island Biogeography	3.0	3.0	0.0	
BIC9028	87 Translational Application of Stem Cell	1.0	1.0	0.0	
BIC9029	88 Translational Application of Stem Cell Experiment	1.0	0.0	3.0	
BIC9030	89 Biodiesel Biotechnology	1.0	1.0	0.0	
BIC9031	90 Biodiesel Biotechnology Experiment	1.0	0.0	3.0	
BIC9032	91 Cancer Biology	2.0	2.0	0.0	
BIC9033	92 Reactive Oxygen Species and Biological Medicine	1.0	1.0	0.0	
BIC9034	93 Methods for Reactive Oxygen Species Measurement	1.0	0.0	3.0	
BIC9035	94 Data Analysis for Ecology and Evolution in R Programming Language	3.0	3.0	0.0	
BIC9036	95 Ecological Plant Physiology	3.0	3.0	0.0	
BIC9037	96 Conservation Biology	3.0	3.0	0.0	
BIC9038	97 Disease Ecology	3.0	3.0	0.0	
BIC9062	98 Plant Cell and Tissue Culture	3.0	3.0	0.0	
BIC9040	99 Signal Transduction	3.0	3.0	0.0	
BIC9041	100 Environmental Physiology	3.0	3.0	0.0	
BIC9042	101 Transgenic	2.0	2.0	0.0	
BIC9044	102 Virology	2.0	2.0	0.0	
BIC9045	103 Inquiry and Practice in Biology	2.0	2.0	0.0	
BIC9046	104 Curriculum Design for Scientific Inquiry and Practices	2.0	2.0	0.0	

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BIC9047	105 Cross-Domain Learning Chinese Medicine and Health	2.0	2.0	0.0	
BIC9048	106 The Application of Biotechnological Advances on Complement for Clinical Practice	2.0	2.0	0.0	
BIC9049	107 Overview of Biomedical Development and Commercialization	2.0	2.0	0.0	
BIC9050	108 Plant Anatomy with Experiment	3.0	2.0	2.0	
BIC9051	109 Mammalogy	2.0	2.0	0.0	
BIC9052	110 The Latest Modern Issues in Biomedical Research and Technology	2.0	2.0	0.0	
BIC9053	111 Biomethodology of Cancer Research	3.0	3.0	0.0	
BIC9054	112 Ecophysiology	3.0	3.0	0.0	
BIC9055	113 Evolution of Insects	3.0	3.0	0.0	
BIC9056	114 E Introduction in Virology	2.0	2.0	0.0	
BIC9057	115 E Histology	2.0	2.0	0.0	
BIC9058	116 Basic and Applied Bone Biology	2.0	2.0	0.0	
BIC9061	117 E Oncology Journal Reading and Discussion	2.0	2.0	0.0	
BIM0125	118 E Ecoacoustics: Principle and Application	2.0	2.0	0.0	
BIM0126	119 E Knowledge Transformation and Dissemination for Life Science	2.0	2.0	0.0	

### III. Free Elective Credits: 0.0 credit is required