Appendices

Appendix 1 – Courses available needing upgrade and training for teaching staff

UM: 1st Semester is December to March and 2nd semester June-September

University	**Type**	**Course No**	**Name of Module**	**Teacher**	**Level BSc, MSc, PhD**	**ECTS**	**Curriculum**	**Semester**	**Theory (H/W)**	**Practical (H/W)**	**Tutorial (H/W)**	**Remark**
Mandalay	Elective	Bot 1002	Importance of Plants	Soe Soe Aung, NgWar Win	BSc	3	Botany	2	2	2	0	First Year Zoology Specialization
Mandalay	Elective	Bot 5208	Advanced Palnt Physiology II	Soe Soe Aung, Hla Myo Aung	BSc (Hons)	3	Botany	2	3	2	0	Third Year Honours Botany Specialization
Mandalay	Core	Bot 623	Plant Boichemistry and Physiology	Soe Soe Aung, Kyaw Kyaw Sann	MSc	4	Botany	2	4	2	0	First Year MSc Botany Specialization
Mandalay	Elective	Geog 1004	Geography of Myanmar	Tin Moe Lwin	BA	3	Geography	2	3	0	1	Geography Minor Specialization
Mandalay	Core	Geog 321	Urban Geography	Tin Moe Lwin	BA	4	Geography	2	4	0	2	First Year Honours Geography Specialization
Mandalay	Core	Geog 714	Remote Sensing (RS), GIS, and Field Training	Tin Moe Lwin	PhD	4	Geography	2	2	2	2	Geography PhD Preliminary

Mandalay	Elective	Geol 2104	Environmental Geology I	Than Than Nu, Hnin Min Soe, Kyi Kyi Mar	BSc	3	Geology	1	2	2	0	Second Year Geology Specialization
Mandalay	Elective	Geol 2108	Environmental Geology II	Than Than Nu, Hnin Min Soe, Kyi Kyi Mar	BSc	3	Geology	2	2	2	0	Second Year Geology Specialization
Mandalay	Elective	Geol 612	Environmental Geology	Than Than Nu, Kyi Kyi Mar	MSc	3	Geology	2	4	2	1	First Year MSc Geology Specialization
Mandalay	Elective	MB 623	Microbiology of Fermented Toods	Soe Soe Aung, Tin Myo Tun	MSc	3	Food Microbiology	2	4	2	1	First Year MSc Microbiology Specialization
Mandalay	Elective	Zool 1001	Ecosystem II	Nang Aye Aye Shein	BSc	3	Environmental Science	2	3	2	n/a	First Year Micrbiology Specialization
Mandalay	Core	Zool 2112	Herpetology	Kyaw Htet Kaung, Nyunt Lwin	BSc	4	Zoology	2	3	2	n/a	Second Year Zoology Specialization
Mandalay	Core	Zool 2113	Ornithology I	Nay Myo Hlaing, Nwet Nwet Win	BSc	4	Zoology	2	3	2	n/a	Second Year Zoology Specialization
Mandalay	Core	Zool 2114	Mammalogy I	Nang Aye Aye Shein	BSc	4	Zoology	2	3	2	n/a	Second Year Zoology Specialization
Mandalay	Elective	Zool 3115/3215	Toxicology	Na Dolly Wilbur, Ni Ni Win	BSc, BSc(Hons)	3	Zoology	2	2	2	n/a	Third Year/ First Year BSc (Hons) Zoology Specialization

Mandalay	Core	Zool 621	Animal Physiology and Endocrinology	Khin Mya Mya, Moe Moe Khine	MSc	4	Zoology	2	4	n/a	2	First Year Master Zoology Specialization
Mandalay	Core	Zool 622	Environmental Studies and Conservation Management	Moe Moe Aung, Than Than Swe	MSc	4	Zoology	2	4	n/a	2	First Year Master Zoology Specialization
Mandalay	Core	Zool 623	Evolutionary Biology	Thant Zin	MSc	4	Zoology	2	4	n/a	2	First Year Master Zoology Specialization
Mandalay	Core	Zool 624	Invertebrate Immunology	Naw Dolly Wilbur, Nang Aye Aye Shein, Ni Ni Win	MSc	4	Zoology	2	4	n/a	2	First Year Master Zoology Specialization
Mandalay	Core	Zool 711	Animal Behaviour	Naw Dolly Wilbur	PhD	4	Zoology	2	3	n/a	2	Zoology PhD Preliminary
Mandalay	Core	Zool 714	Biostatistics	Thant Zin	PhD	4	Zoology	2	3	n/a	2	Zoology PhD Preliminary
Myeik		Geol 2104	Environmental Geology I	Ky Ky Maw Myint Swe	BSc	3	Geology	1	2	n/a	2	
Myeik		Geol 2108	Environmental Geology II	Ky Ky Maw Myint Swe	BSc	3	Geology	2	2	n/a	2	
Myeik		Geol 621R	Environmental Geology	Ky Ky Maw Myint Swe	MSc	4	Geology	2	4	n/a	2	
Myeik		Bot 1101	Plant Biology	Khin Moe Moe Myint	BSc	4	Botany	1	4	2	0	
Myeik		Bot 1102	Basic Concept of Applied Botany	Khin Moe Moe Myint	BSc	4	Botany	2	4	2	0	

Myeik		Bot 2104	Ecology	San San Myint	BSc	4	Environmental Science	1	4	2	0	
Myeik		Bot 3104/3204	Environmental Biology	Lae Lae Khaing	BSc, BSc(Hons)	4	Environmental Science	1	4	2	0	
Myeik		Bot 3110/3210	Biodiversity and Conservation	Lae Lae Khaing	BSc, BSc(Hons)	4	Environmental Science	2	4	2	0	
Myeik		Bot 4107/4207	Applied Ecology	Khin Myo Thant	BSc, BSc(Hons)	4	Environmental Science	2	4	2	0	
Myeik		Bot 5211	Ethnobotany	Khin Myo Thant	BSc, BSc(Hons)	4	Botany	2	4	2	0	
Myeik		Bot 5212	Environmental Education and Ethics	Khin Hla Win	BSc, BSc(Hons)	4	Environmental Science	2	4	2	0	
Myeik		Bot 622	Environmental Science	Yadana	MSc	4	Environmental Science	2	4	2	0	
Myeik		MS 624	Estuarine Ecology	Aung Aung Aye	MSc	4	Marine Science	2	4	3	0	
Mawlamyine		MS 714	Marine Resources	San Tha Tun	PhD	4	Marine Science	1, 2	4	2	n/a	
Mawlamyine		MS 1104	Biological Oceanography II	Hlaing Hlaing Htoon	BSc	4	Marine Science	2	3	1	1	
Mawlamyine		MS 2107	Physical Oceanography	Khin Myo Myo Tint	BSc	4	Oceanography	2	0	1	0	

Mawlamyine		MS 2110	Marine Vertebrates	Khin; Myo; Myo Tint	BSc	3	Marine Science	2	0	1	0	
Mawlamyine		MS 4104	Systematics and Ecology of Seagrasses	Aung Myo Hsan	BSc	4	Marine Science	1	3	2	n/a	
Mawlamyine		MS 5208	The Health of the Oceans	Aung Myo Hsan	BSc	4	Environmental Science	2	3	2	n/a	
Mawlamyine		MS 613	Biology of Large Marine Mammals	May Thaw Khin	MSc	n/a	Marine Science	1	n/a	n/a	n/a	
Mawlamyine		MS 624	Estuarine Ecology	May Thaw Khin	MSc	n/a	Marine Science	2	n/a	n/a	n/a	
Mawlamyine		Zool 1102	Life Processes and Homeostasis	Aye Aye Myint	BSc	4	Zoology	2	3	2	n/a	
Mawlamyine		Zool 3115 /3215	Toxicology	Aye Aye Myint	BSc, BSc(Hons)	4	Zoology	2	3	2	n/a	
Mawlamyine		Zool 622	Environmental Studies and Conservation Management	Aye Aye Myint	MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 5209	Evolution	Aye Aye Myint	BSc, BSc(Hons)	4	Zoology	2	3	2	n/a	
Mawlamyine		Zool 1001	Chemicals of Life and Life Processes	Naw Zarchi Linn	BSc	4	Zoology	2	2	2	n/a	

Mawlamyine		Zool 621	Physiology and Endocrinology	Eaindar Cho	MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 622	Environmental studies and conservation management		MSc	4	Environmental Science	2	4	2	n/a	
Mawlamyine		Zool 623	Evolutionary biology and animal behavior	Eaindar Cho	MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 624	Invertebrate Immunology		MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 621	Physiology and Endocrinology	Aye Nyein Soe	MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 622	Environmental studies and conservation management	Aye Nyein Soe	MSc	4	Environmental Science	2	4	2	n/a	
Mawlamyine		Zool 623	Evolutionary biology and animal behavior		MSc	4	Zoology	2	4	2	n/a	
Mawlamyine		Zool 624	Invertebrate Immunology		MSc	4	Zoology	2	4	n/a	2	

Appendix 2 – Learning outcomes and course description

As for the classes listed in Appendix 1.

Course No	**Learning Outcomes**	**Course Description**
Bot 1002	Basic knowledge plants and biology; to know the economic importance of plants and their uses for foods, shelters and clothes	How is important of plants in the world; morphological characteristics of useful plants, cereal crops and their nutrient potentials for human being; to know about the knowledge of bioethanol production from plants; to know broadly about plant materials using for cloth, wood, paper, fibres and bamboo; to know nature of earth and their environment; how to function of plants by plant growth hormones
Bot 5208	To understand the advanced concepts of plant physiology; to monitor on plant stress and its conditions; to know very well the concepts of plant stress physiology	Definition and terms of plant stresses; to understand the functions and mechanisms of stress occurrences on plants; to know the interactions of plants stress combinations and plant responses to their environment; to know the detailed about the individual stress occurrences, tolerant, and resistant of plants; how wo survive and adapt the plants under stress conditions and its influencing factors
Bot 623	To know the basic concepts of plant biochemistry and plant physiology and their environment; to obtain the knowledge of biochemical pathways in plants and their physiological process and mechanisms	Definitions and terms of biochemistry and physiology; how is important role of intermediate chemical compounds taking part in plants; how to produce ATP production from plants; to know about the biochemical pathways during photosynthesis, photo-phosphorylation and respiration; plant growth hormones response to plants and environment
Geog 1004	Basic Knowledge of Myanmar, To be familiar with the Physical Geography of Myanmar, To understand the size and shape, the States and Region within Myanmar, To Know Cultural background, Demographic factors, Natural Resources, Economic activities and production, Regional Analysis on the States and Regions	Introduction, Location, Size, and Shape, Paleogeography of Myanmar, Physical bases of Myanmar, Cultural Bases of Myanmar, Demographic factors, Human Resource Development, Economic activities of Myanmar (Agriculture, Livestock and Fishery, Forestry, Mineral Resources and Exploration, Processing and UMfacturing) Regional analysis on States and Regions of Myanmar (7 States and 7 Regions)
Geog 321	To Know Basic Knowledge of Urban Geography, To understand level of analysis in Urban geography, the global urbanization level, including Developed and	The Scope of Urban Geography, Defining the Urban, Theories of Urban Origins, Urban Characteristics of Place, Early Urban Hearths, Urbanization and Urban Change,

	Developing Countries, To know urban system and urbanism, urban Places, To understand how to do Sustainable Urban Development, and the relationship between economic development and environmental conditions	Urbanization and Economic Growth, Urban Systems and Urban Structures, Southeast Asian Cities, The Quality of Urban Life, Urban Models,
Geog 714	To train the students who are able to understand fundamentals and critical knowledge of Geospatial Technology:, Students are able to Understand: the definition and fundamental concepts of Geospatial Technology, the definition, History and usage of Remote Sensing, the electromagnetic energy, The Electromagnetic Spectrum Interaction of EM energy with other medium types and stages of RS, Information Extraction from Satellite Image and visualization of Image data, Remote Sensing Projects in Various Fields, To get the students who are able to understand fundamentals and practical knowledge of Geospatial Technology especially GIS, To understand some of the case studies related to: Watershed studies, Flood Studies, Health issues, Security and Defence Studies, Urban and Infrastructure Development Studies, Disaster Relief / management	Definition of RS and GIS, Electromagnetic Radiation, Interaction of Earth features with EMR, Interaction with the atmosphere, Spectral characteristics. Components of A GIS, Geographically referenced data, Coordinate system, Data model and data structure, Spatial data model (vector and raster), Spatial analysis, measurement, query, attributes based operation, modelling surface, modelling network, Output generation, map design, map layout, and cartographic symbolization.
Geol 2104	Geology and environmental; geology as a science: Basics and definition.; Understanding the relationship between the natural geological factors and hazards.; Increasing human population as; the number one environmental; problem.; The concept of sustainability and; important factors related to the; Environmental crisis;	Basic knowledge of environmental geology in the fields of natural hazards (Earthquake, Tsunami, Landslide, Volcanic activities, Flooding); The factors required to understand to predict and mitigate the potential impacts from hazards; Case studies
Geol 2108	Basic knowledge of ecology in environmental geology and relationship between ecology and	Basic concepts of ecology and linkages to geology; Water pollution: definition and some of the common water pollutants.; Water pollution problems: cultural eutrophication,

	geology by defining a few terms and principles (species, population, ecological community, habitat); Water and soil pollution: Pollutants (oxygen demanding waste, pathogenic organisms, nutrients, oil, toxic substance); Factors (naturally or human activities) to cause water pollution, to minimize or control the problem, water quality monitoring. Waste disposal: Sanitary landfill, incineration, recycling, toxic waste disposal	acid mine drainage and metal leaching; Some of the important issues related to water quality; standards.; The relationship between waste disposal and pollution (water, soil and air); Factors required to consider for site selection and waste disposal method to mitigate pollution
Geol 612	Understanding the potential environmental problem depends on the nature of geology, lithology, mineralogy and method of mining; Understanding the acid-generating minerals and acid consuming minerals and prevention or minimizing of ARD and metal leaching; Factors to be consider in disposal of mine wastes and tailing storage pond to control or minimize potential environmental problem; Some of the important issues related to; water quality standards; Understanding the processes by which; groundwater may become polluted; and how polluted water may; be treated.	Physical impact of mining activities: changes in landform, water erosion, slope failure and landslide; Chemical impact: Mine wastes (waste rocks, tailings. etc.,); Mine effluent, acid rock drainage (ARD), metal leaching; Water and soil pollution; Mine waste management; tailing management, water management; Environmental impact of dams and roads, etc.; Case studies
MB 623	To know the food safety and food management; how is important of microbial activities of fermented foods and contaminated water; why we should prevent microbial diseases for survival	To know the concepts of water borne diseases and food born diseases; diseases causes of pathogens; food production methods; food spoilage and fermented foods and contaminated water and sewage water; the diagnosis of disease carriers via. Bacteria, fungi and virus; how to make a wine and fermented foods for safety and their management
Zool 1001	Basic knowledge of ecology and ecosystem; Behavioral ecology as required form environments; Concept of an ecosystem	Structure and functions; Producers, consumers and decomposers; Energy flow; Food chains, food webs and ecological pyramids; Forest ecosystem; Grassland ecosystem; Desert ecosystem and aquatic systems

Zool 2112	Understand the nature and biology of diverse herpetofauna species and interpret the ecological requirements and conservation status of these animals	Amphibian, General feature of the class amphibian, Classification of order and suborder, Characteristics of each species (3 frogs, 1 toad, salamander and caecilian only one, Reptile, characteristics of class reptilia, Classification of subclass, order and suborder, Morphology and physiology, Characterises of each species (4 snakes, 1 lizard, 1 tortoise, 2turtle and only one crocodilian)
Zool 2113	Understanding basic knowledge of birds, understanding of basic bird groupings, knowledge of higher level classification and basic knowledge of identification, knowledge of birds' external and internal structures.	How birds derived and their characteristics (Evolution of birds and characteristics), different group of birds according to beak and feet types, Classification of Modern birds (True birds) to order and family levels, Structure of and functions of organ systems (Fowl), egg formation and early development of birds
Zool 2114	Mammals are classified with using common features; the integration of form and function in the evolutionary development; Diversity of mammalian forms; the feeding apparatus; focusing on the capturing; processing of Food are learnt; Internal processes are regulated by the nervous and endocrine system; life history features of Mammals are studied.	To know the characteristics of Mammals; To understand the dynamics of locomotors processes in mammals with the arrangement of structures and their functions; To learn the modes of deeding and foraging strategies in mammals; To study some general aspects of two body control systems that are unique to mammals
Zool 3115/3215	Understand a broad set of toxicology knowledge concerning the fundamentals in the basic areas of toxicology, Demonstrate and understanding of legal, regulatory and ethical considerations relating to toxicology within the broader societal context, Obtain knowledge of sources, levels and mechanisms of action for toxic substances, Knowledge of effects of toxic substances on cellular levels, individual health and on natural populations and communities	Toxicology is the scientific study of adverse effects that occur in living organisms due to chemicals. It involves observing and reporting symptoms, mechanisms, detection and treatments of toxic substances, in particular relation to the poisoning of humans. It also includes environmental agents and chemical compounds found in nature as well as pharmaceutical compounds that are synthesized for medical use by humans. These substances may produce toxic effects in living organisms including disturbance in growth patterns discomfort, disease and death.
Zool 621	Integrated understanding of physiological mechanisms, appreciation of how the parts of body are linked into a whole function	What is Physiology Definitions and Introduction; Cellular physiology and Homeodtasis with examples. Physiology of digestion, Physiology of respiration, Physiology of Cardiovascular System, Physiology of Excretion and Osmoregulation, Physiology of

		muscle contraction, Physiology of Reproduction. Endocrinology Chemical coordination endocrinology system; mechanisms of hormone action, Vertebrate endocrine glands and hormones
Zool 622	Apply knowledge to solve problems related to wildlife conservation and management. Implement wildlife conservation and management relates to the economy and environment, both currently and in the future. Critically evaluate current event and public information related to wildlife conservation and management as being scientifically based or opinion based and contributes to the knowledge base of information	Environmental Studies, Environmental Ethics, Earth and Life (Earth system and Resources), water pollution and water related disease and disasters, Earth resources and man, Climate change, environmental hazards and Ecosystems. Definition of the term conservation and biodiversity. Species Dispersal, dispersion and distribution. What is the best ways to conserve biodiversity? Conservation strategies. Biodiversity hotspots. Conservation in practice. Effect of (habitat change and fragmentation, commercial hunting, pest control, competition with introduced species, environmental contaminant). International conservation (IUCN Red Data Books, the role of CITES). Management.
Zool 623	To understand the relation of chemical evolution and biological evolution. To understand the phylogeny and speciation	Evidence of evolution; Speciation through isolation; Patterns in evolution; Five agents of evolutionary change; Biology of evolution
Zool 624	Understanding the immune defences of invertebrate; gain the Knowledge of microbes diversity and their role in the field of Immunology. Concepts and necessary background hypotheses in immunology, biodiversity, managing and efficiency control in nature conservation.	What is animal immunology basics and definitions; Immunology is a science that deals with the immune system and the cell mediated and humoral aspects of immunity and immune response. Mechanism of immune modulation by Fasciolar hepatica: The impact if the innate immune cells on the developing immune response. Neuroendocrine control of immune response. during helminth infection immunomodulation by parasitic Helminths and its therapeutic exploitation
Zool 711	Basic knowledge of Behaviour in the fields of animal ecology and behavioural ecology as required for environmental protection; gain understanding the interaction between humans and animals. Essential concepts in ecology and applying them to current issues. Logic of science is powerful, understandable and beautiful, Understanding monitoring of animals and plants,	What is animal behaviour? Definitions; scientific study of wild and wonderful ways in which animals interact with each other, with other living begins, and with environments, behavioural ecology and evolution. evolution of altruism, evolution of Social behaviour, evolution of communication, avoiding predators and finding food, evolution of reproductive behaviour, Parental care, The developmental basic of behaviour, especially role of genes play as proximate factors underlying animal behaviour. Evolution, nervous systems, and behaviour. evolution of Human behaviour.
Zool 714	To understand the concept and knowledge of biostatistics in the analysis of biological attributes	Sampling basics and definitions, sampling variation and bias, sampling techniques; Basis of statistical inference; Tests of significance and estimation, large samples, small

	and its related environmental factors, To apply the statistical tests to solve the biological problems such as similarity or differences of biological parameters within the same species as well as among the different species relation with environmental parameters,	samples; Linear regression and correlation, correlation coefficient, regression equation; The Chi-square test; Analysis of variance, The F-test, One-way ANOVA, extension to Two-way ANOVA; Nonparametric or distribution free statistical tests
Geol 2104	Understanding and monitoring of the geologic hazards	Geologic Hazards, (Hazards from earthquake, Hazards from volcanic eruption, Hazards from ground failures, Hydrologic Hazards and Coastal Hazards),
Geol 2108	To understand the protection and conservation of natural environment To know the basic knowledge of protection and conservation for pollution	Human Induced Hazards (Waste disposal, Disposing of solid waste and Management of waste disposal). Soil Degradation, Erosion, Desertification and DeforestationUsing and Caring for Earth Resources (Environmental impacts of mineral development and using fossil fuels)Pollutions (Water and Air pollution)
Geol 621R	To provide advanced the various geological and human induced hazards · To know solid and liquid wastes disposal · To know disaster management and risk reduction To upgrade the apply knowledge and to solve problems related to conservation and managements of, the natural environments for students,	Nature and Aspects of various geologic Hazards (Hazard from earthquake, volcanic eruption, and ground failures) Ways and means of mitigating these Hazards Geologic condition for proper waste disposal Proper use and care of earth resources (groundwater and mineral resources, fossil fuel, and soil)Disaster management and risk reduction Impacts of Sedimentation Various Coastal Processes Biodiversity and their ecosystem Managements of waste disposal
Bot 1101	Understand the basic botanical knowledge. Get knowledge of the organization of cell and progressive organization of tissue and organs; followed by the diversity of plants and their relatives, the evolutionary relationship between plant groups. Know broadly about plant physiology or day-to-day functioning of the most complex groups of plants growth, reproduction, heredity and plants and their environment.	Botany as a science, The origin of life, Cell, Tissue and organ, Diversity of plants, Absorption and transport, Plant nutrition, Energy in plants, Plant growth, Plant reproduction, Plant heredity, Plants and their environments
Bot 1102	To know the dependence of human and all animals life on plants (food, medicine, clothing and shelters), to understand the basic concepts of an applied field	Managing a Long Term Seed Stored for Genetic Recourses Conservation, The Determination of Moisture Content and the Number of Seeds in Accession, Characteristics of Seed Dormancy and Factors which Influence it, The Determination of

	of botany concerning the plant hormones, various kinds of biotechnology and bonsai growing technique	Empty Seed Fraction, The Conduct of Seed Germination Test, Dependence of Human and All Animals life on Plants, Early History and Development of Plant Study, Plants and Peoples, Plants as Medicine, Plants for Clothing, Plants Hormones, Introduction to Plant Biotechnology, Fungi Technology, Bonsai
Bot 2104	Understand the meaning of ecology and the relationship between the ecosystem and biosphere. Gain the knowledge of climatic factor, edaphic factor, topographic factor and biotic factor.	Introduction the meaning of ecology, Environment of plants: Climate factor, Environment of plants: Edaphic factor, Environment of plants: Topographic factor, Environment of plants: Biotic factor, Species and population, Ecosystems and living organisms
Bot 3104/3204	To understand the interrelationship among organisms and their surrounding environment and how they symbiosis each other, To gain the knowledge of human population problems, orgin of pollution and types of pollutants	To know the Biotic and its Surrounding or Environments, Abiotic environmental Factors, Biotic environmental Factors, Population, Pollution, Natural Resources and Management,
Bot 3110/3210	Understand the current information to biodiversity and able to know why they are important for the whole ecosystem.	Introduction to biological diversity, Threatto biodiversity, The value of biodiversity, Wildlife, Fisheries and Endangered species, Conservation and sustainable development
Bot 4107/4207	To understand deeply about the sustainability. To gain the knowledge of Applied Ecology. To know clearly about the characteristics Pollution. To be able to find good solution to solve the conservation. To get the information for EIA.	Sustainability Exploitation and agriculture, Pollution, Conservation, Introduction of exotic species, The principles of EIA
Bot 5211	Understand the meaning of Ethnobotany and its related subjects. Also understand the disciplines and sub-disciplines related to Ethnobotany and know how they are important for peoples' daily life. Also gain the ethno-medicinal knowledge and environmental conservation knowledge that is related with the Ethnobotany.	Introduction, Ethnobotany: Scope and Status, General Ethnobotanical techniques, Data collection and data compilation, Ethno-medicine, Ethnobotany and conservation, Quantitative ethnobotany, Applied ethnobotany
Bot 5212	To foster clear awareness of, and concern about, economic, social, political and ecological	History and Development of Environmental Education, The global Agenda, Perspectives on Theory and Researching in Environmental Education, Environmental Education:

	interdependence in urban and rural areas. To provide every person with opportunities to acquire the knowledge, values, altitudes commitment and skills needed to protect and improve the environment. To create new patterns of behaviour of individual, groups and society as a whole, towards the environment.	Structure and practice, The Global Scene, Towards progress and Promise in the Twenty-first Century
Bot 622	Understand deeply about the Environmental Science. Gain the knowledge of Environmental Ecology, Know clearly about the characteristics of minerals and natural resources and their values; how they are important for the whole ecosystem. Able to find good solutions to solve the environmental problems. Get the ideas and information for a sustainable plan.	Thinking Critically about the Environment, Environmental Ecology, Natural Resources, Environmental Problems, Planning for sustainable Future
MS 624	(1) Understand habitats in estuaries and the physical processes that contribute to their formation (2) Understand the important ecological processes that operate in estuaries (3) Understand human and natural impacts on estuary ecosystems and how animals and plant respond and adapt to these impacts (4) Synthesis information about assessment of estuary health and management processes in Myeik Estuary Area (5) Engage in informed discussions related to complexity and functioning of soft sediments ecosystems, how science is conducted in these systems, the science behind management/ conservation and possible solutions to the challenges caused by human activities (6) Critically evaluate relevant scientific literature and demonstrate this ability through a written essay and discussions in seminars (7) Design, collect and	1) Introduction to Estuaries 2) Physical and Chemical Characteristics of Estuaries 3)Biological Processes in Estuaries and Marine Ecosystems 4)Ecological Processes of Estuarine 5) Ecological Compartments and Their Interactions 6) Impacts on Estuaries Communities 7) Conservation 8) Recent and Management Issue in Various Myanmar Estuaries

	analyse field data using appropriate techniques (8) Write a scientific report that is integrated with the relevant literature	
MS 714	To understand; The importance of Marine living resources and non-living resources; to know how to use marine resources wisely; to know how to manage marine resources sustainably	Fisheries resources: Scale of the world's fisheries, Fishing methods, overfishing, Fisheries regulation, Fish farming problems. Mineral resources: Terrigenous, Chemogenous, Biogenous deposits, Polymetallic nodules, Polymetallic crusts.
MS 1104	To understand; Ocean terminology; Major taxonomic groups of marine organisms; Concept of food webs and ecological systems	Life history of plankton and benthos; Zonal distribution and migration; food webs and ecological systems; effect of abiotic factors on species and communities; chemical and physical effects of the community on their environment; pollution; exploitation
MS 2107	Have knowledge of general physical properties of ocean	The nature of seawater; Physical properties of ocean water; climate patterns, weather, formation and impacts of El Niño/La Niña on marine environments; renewable sources of energy; ocean circulation; wave characteristics
MS 2110	Knowing about the general characteristics of Chordate	Classification of Chordate; External features of bony fishes; The general characters of Amphibians; The general characters of Reptiles; The general characters of Aves; The general characters of Mammalia
MS 4104	Basic principles of ecology; The important roles and of seagrasses; Conservation and monitoring program	Systematics; Ecological roles; Adaptation to their environment; Productivity; Sampling; Long term monitoring program
MS 5208	Biological and chemical constituents and their pattern of recycle; Knowing specific problems concerned with environment; Values of environment; Methods for the assessment and controlling procedures	Oceans system; Biogeochemical cycles; Pollution in the marine environment; Uses of the marine environment in relation to pollution; Specific problems of regional significance; Methodology for the assessment and control of marine pollution
MS 613	to know the different kinds of marine mammals; to know the conservation needs for marine mammals	Basic knowledge of large marine mammals; Adaptation of swimming and diving mechanism; Behaviour of large marine mammals (Seals, Sea lions, Dugong, Dolphin, Porpoises and Whales); Mechanisms of echolocation; Vocalization and complex behaviour of Cetaceans; Feeding mechanisms; Reproductive behaviour of whales in their natural environment

MS 624	To know estuary is important habitat for euryhaline species; To know how to manage impacts on estuarine communities	The nature, origin and classification of estuaries; Physical characteristics of estuary; Human impacts on estuarine communities
Zool 1102	receive the basic concept on metabolic reaction take part in various organisms	Nutrition; Cellular respiration; Transport, Types of circulatory system; Homeostasis; Adaptations for hot and cold environments
Zool 3115 /3215	obtain knowledge of sources, levels and mechanisms of action for toxic substance; knowledge of effects of toxic substances on cellular levels, individuals health and on natural populations and communities	Definition on toxicology; Basic knowledge of toxicology; Research methodology in toxicology; Acute toxicity, Chronic toxicity, Potential sources of toxicities, Poison prevention and control strategies; Environmental pollution and health effects; Health impact of specific pollutants; Diseases caused by hazardous pesticides; Pesticide toxicity research in Myanmar
Zool 622	get knowledge to solve problem related to wildlife conservation and management; and also have a greater knowledge of how wildlife conservation and management relates to the economy and environment, both currently and in the future students will be able to critically evaluate current events and public information related to wildlife conservation and management	Environmental Ethics; A view on Earth; Protecting resources; Sustainable water management; Earth's Resources and Man; Natural cycles between the spheres; Renewable resources; Global warming; Measuring exposure to environmental hazards; Ecosystems; Value of biodiversity; Conservation Strategies; Value of endangered species; Kinds of managements; Conservation in practice management plan
Zool 5209	Students will be able to understand the relation of chemical evolution and biological evolution, phylogeny and speciation; in addition to obtain the interaction between humans and other animals	Evidence of evolution; Natural selection; The essence of Darwin Theory; Types of selective process; Allele frequencies change; Origin of species; Reproductive isolation; Chromosome change; Fossil record; Rate of evolution
Zool 1001	Understanding the chemical basis of living cells and tissues; Awareness of the importance of the chemical elements in nutrition and health	Variations in vertebrate digestive systems; Accessory organs: secretions of the pancreas; the liver and gallbladder; The actions of insulin and glucagon; Regulatory functions of the liver; Regulatory of blood concentration; Neural and hormonal regulation of digestion; Food energy and energy expenditure; Essential nutrients
Zool 621	gain broad knowledge of animal physiology and endocrinology; understand physiological mechanisms and know fundamental scientific	Cellular physiology and homeostasis; physiology of digestion; chemical coordination endocrine system

	concepts; get an understanding of how the parts of body are linked into a whole function	
Zool 622	know how our environment is important; understanding about wildlife conservation and management and how to solve its problems; about what and how can we do in our daily life to protect our environment; get greater knowledge of the relationship between wildlife conservation management and the economy and environment in the present and future	Environmental studied; Environmental ethics; A view of Earth; Protecting resources; Sustainable water management; Earth resources and man; Climate change; Environmental hazards and ecosystems; Value of biodiversity; Conservation strategies; Value of endangered species; Kinds of management; Conservation in practice management plan
Zool 623	gain knowledge about biology and evolution of organisms; understand the relationship between chemical and biological evolution; know to pay attention on the endangered species in the world; understand how humans and other animals interact with each other	Evidence of evolution; Biology of evolution; Observation and measurement of behaviour; maintenance of behaviour and temporal consideration; Spatial aspects of behaviour; Foraging and antipredator behaviour; Behaviour in social groups; Interaction between human and other animals
Zool 624	know about the nature of microbes and diversity of microbes; get knowledge the role of microbes in immunology field; understand about microbes' immune response	Definition and basic of animal immunology; Fasioler hepatica's mechanism of immune modulation; Neuroendocrine control of immune response; Immunomodulation by parasitic Helminths and its therapeutic exploitation; Evasion of the innate immune system by virus;
Zool 621	Students will be able to an integrated understanding of physiological mechanisms; Students will have an appreciation of how the parts of body are linked into a whole function	Cellular physiology and homeostasis; Definitions and features; Osmosis, metabolism,; Types of digestion; The birth of endocrinology; Nuclear receptors; Hormones of metabolism
Zool 622	Students will be able to apply knowledge to solve problems related to wildlife conservation and management; Students will have greater knowledge of how wildlife conservation and management relates to the economy and environment, both currently and in the future; Students will be able to critically evaluate current events and public	Environmental studies; A view of Earth; Groundwater; Water pollution; Volcanoes; Various spheres; Air pollution; Climate changes; Global warming and acid rain; Biodiversity; Wildlife conservation and management

	information related to wildlife conservation and management as being scientifically bases and contributes to the knowledge base of information	
Zool 623	understand the relation of chemical evolution and biological evolution; Understand the phylogeny and speciation; Gain an understanding the interaction between humans and other animals	Evidence of evolution; Populations can become isolated in several ways; Patterns in evolution; Genetic drift; Natural selection; Science and the study of behaviour; Habitat selection and use; Foraging and antipredator behaviour
Zool 624	The students should be more interested in morphology of microbe; The students should be more understand about immune response of microbe	The immune defences of invertebrates; Mechanisms of immune modulation; Evasion of the innate immune system by virus; Neuroendocrine control of the immune response; Immunomodulation by parasitic helminths and its therapeutic exploitation