

**MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE**  
(2012 – 2013 Curriculum Vitae)

Revisions: Only subject numbers.

Added subject: ES 200. Residency (3) – three units in parenthesis; ES 150. Seminar in Environmental Science.

Classification	Subject Number	Subject Description	Total Number of Units	Lecture		Laboratory	
				Units	Contact Hours	Units	Contact Hours
Core Subjects (15 units)	ES 101	Ecosystems	3	2	2	1	3
	ES 102	Air, Water and Soil Interactions	3	2	2	1	3
	ES 103	Environmental Laws and Policies	3	1	1	2	6
	ES 105	Elements of Research	3	2	2	1	3
	ES 106	Environmental Impact and Resource Assessment	3	1	1	2	6
Major Electives (9 units)	ES 111	Environmental Economics & Sustainable Dev't	3	2	2	1	3
	ES 112	Socio-cultural Perspectives on the Environment	3	2	2	1	3
	ES 113	Design and Planning of the Coastal Zone	3	2	2	1	3
	ES 114	Land Use	3	2	2	1	3
	ES 115	Urban Development and Planning	3	2	2	1	3
	ES 116	Water Chemistry and Wastewater Management	3	2	2	1	3
	ES 117	Soil/Air Chemistry and Waster Management	3	2	2	1	3
	ES 118	Environmental Parameters & Their Determinations	3	2	2	1	3
	ES 119	Environmental Toxicology	3	2	2	1	3
Free Electives (6 units)	ES 121	Economics of Natural Resources	3	2	2	1	3
	ES 122	Hydrography and Mapping	3	2	2	1	3
	ES 123	Aquaculture and the Environment	3	2	2	1	3
	ES 124	Travel and Tourism Industry Management	3	2	2	1	3
	ES 125	Water Quality Management	3	2	2	1	3
	ES 126	Urban Development and Planning	3	2	2	1	3
	ES 127	Occupational Health Hazards	3	2	2	1	3
	ES 128	Exotic Species and the Environment	3	2	2	1	3
	ES 150	Seminar in Environmental Science	3	2	2	1	3
Residency	ES 275	Residency	(3)			3	9
Masters Thesis	MB 300	Masters Thesis	6			6	18

Coverage of Comprehensive Exams: Total number of topics = 6

- (1) Ecosystems
- (2) Air, Water and Soil Interactions
- (3) Elements of Research
- (4) Environmental Impact and Resource Assessment
- (5) One Topic from Major Subjects
- (6) One Topic from Electives

## COURSE DESCRIPTIONS

### **ES 101 Ecosystems (3 units)**

Focuses on the different ecosystems, their components and interactions between them, with special emphasis on coastal ecosystems.

### **ES 102 Air, Water and Soil Interactions (3 units)**

An overview of the basic principles involved in the chemical and physical basis of environmental science; includes the entry and fate of the different pollutants in the environment

### **ES 103 Environmental Laws and Policies (3 units)**

An overview of the existing international and national laws which are relevant to the environment

### **ES 105 Elements of Research (3 units)**

An introduction of the basic principles of scientific research including techniques in the collection, analysis and presentation of data

### **ES 106 Environmental Impact and Resource Assessment (3 units)**

Identification of parameters for consideration in EIRA; factors considered in the selection, modification and development of EIRA methods; analysis of impacts on the environment.

### **ES 111 Environmental Economics & Sustainable Development (3 units)**

Analyzes the intrinsic value of natural resources; the profits derived from a development enterprise as against the long term of mitigation and regeneration of damaged ecosystems.

### **ES 112 Socio-cultural Perspectives on the Environment (3 units)**

Different cultural settings of people, their historical and present-day utilization of the resources; the evolution of behavior towards the environment and its utilization; the roles and effects of major socio-cultural factors of population growth and other demographic process (fertility, mortality and immigration) on the status of the environment.

### **ES 113 Design and Planning of the Coastal Zone (3 units)**

### **ES 114 Land Use (3 units)**

Overview of the use of land in the upland and coastal environments with emphasis on the landscape approach to coastal management

### **ES 115 Urban Development and Planning (3 units)**

Urban development and planning gives an overview of the changes and environmental problems which accompanied urbanization. The course will also deal with the environmental basis of urban development planning.

### **ES 116 Water Chemistry and Wastewater Management (3 units)**

### **ES 117 Soil/Air Chemistry and Waste Management (3 units)**

Soil chemistry, its alterations by land and cultivation practices and as a receptor of waste products; also includes elements and compounds present and emitted to the atmosphere as a result of man's activities and a comparison of the mechanism of classical and photochemical smog formations

### **ES 118 Environmental Parameters and Their Determinations (3 units)**

Overview of the parameters in assessing the quality of the environment; includes the sociological, biological, chemical and physical parameters

### **ES 119 Environmental Toxicology (3 units)**

An overview of the various toxic and lethal substances that are produced in industrialization and urbanization or naturally produced by the environment (red tides); includes heavy metal pollution. The concept of bioaccumulation will be discussed and various classic cases will be cited (ex., Minamata Disease, cadmium poisoning). Cyanide fishing, pesticide use and other practices that release toxic or lethal substances to the environment and their effects will be included.

**ES 121 Economics and Natural Resources (3 units)**

Includes natural resource valuation concepts, cost-benefit analysis of natural resources, environmental and natural resource accounting

**ES 122 Hydrography and Mapping (3 units)**

Focuses on the measurements of physical characteristics (conditions, boundaries and others) of waters and marginal lands; includes techniques in mapping of the coastal zone and its resources; includes the use of computer programs such as Google Earth and mapping programs such as autocad, surfer and others.

**ES 123 Aquaculture and the Environment (3 units)**

Study of existing aquaculture and mariculture techniques; design, management and economics of the techniques and the impacts of these techniques to the environment (includes water management, land conservation, use of chemicals)

**ES 124 Travel and Tourism Industry Management (3 units)**

The identification and development of features in the locality that have a tourism potential; requirements for the development of the site (feasibility studies, information collection and dissemination); management techniques involved travel and tourism, identification of potential effects to tourism on the locale.

**ES 125 Water Quality Management (3 units)**

Biological and chemical characteristics of water, methodologies of water analysis (coliform counts, total suspended solids and sedimentation, phosphates and nitrates); significance of water quality to the coastal zone and its inhabitants.

**ES 126 Urban Development and Planning (3 units)**

Urban development and planning gives an overview of the changes and environmental problems which accompanied urbanization. The course will also deal with the environmental basis of urban development planning.

**ES 127 Occupational Health Hazards (3 units)**

Will cover the different hazardous substances that a person may be subjected to in and around industrial plants with emphasis on the total health impact on both short- and long-term effects to even low levels of toxicants; includes the health effects on noise, particulates, mineral fibers and radioactivity.

**ES 128 Exotic Species and the Environment (3 units)**

The course will deal with the significance of endemic species, the effects of introduction of exotic or non-endemic species and their possible repercussions to natural endemic populations in terms of disease introduction and translocation.

**ES 150 Seminar in Environmental Science (3 units)**

**ES 275 Residency (3 units)**