

Proposal for B.Sc. Special Degree Programme in Environmental Science by the Faculty of Science, University of Peradeniya

Background:

There is a growing demand for graduates with a degree in Environmental Science to deal with environmental problems both at the national and the global level. Global environmental problems such as climatic change, ozone layer depletion, acidic depositions and national environmental problems such as solid waste accumulation, and water, air and soil pollution require the efforts of a new breed of science graduates trained in the broad discipline of Environmental Science. It encompasses a wide range of disciplines from chemistry, biology, geology and physics to economics and the social sciences. With the need to manage the consequences of natural disasters such as tsunamis, hurricanes and earthquakes on an already fragile environment, this field is going to assume added importance in the future.

The demand for graduates with experience in the multidisciplinary area of Environmental Science has increased with increasing awareness of the importance of protecting the environment. The commencement of the degree programme with environmental science as a full pledged degree subject attempts to fulfill a long felt national need of Sri Lanka.

The Faculty of Science consisting of the Departments of Botany, Physics, Chemistry, Geology, Zoology, Mathematics, Statistics & Computer Science and Molecular Biology & Biotechnology with research strengths in both basic and applied sciences is one of the leading candidates to run such an interdisciplinary programme. It also has the only Department of Geology in the entire university system, the role of which is vital in an Environmental Science programme. At the Faculty of Science, Environmental Science courses have been taught as a minor subject since 1997. There are several faculty members actively pursuing research projects in Environmental Science and their work has received both national and international acclaim. In addition, the Faculty is also involved in teaching environmental science at the postgraduate level and the M.Sc. programme of the Postgraduate Institute of Science has been conducted mostly by the members of the Faculty of Science since 1997.

Initially it will be started as a separate unit with the existing facilities and cadre with the intention that the unit be upgraded to a separate department by acquiring the carder positions and funding with the UGC approval at a later date.

Name of the degree: B.Sc. Special Degree in Environmental Science

Duration: Four years

Medium of Instruction: English

Aim and Objectives:

At the completion of the special degree course, graduates would have acquired the knowledge and skills necessary to meet the demands of an environmental scientist with a broad knowledge of its constituent branches of study.

More specifically, graduates of Environmental Science are expected to be able to:

- Understand the multidisciplinary nature of the subject and its fundamental aspects.
- Provide problem solving skills that will enhance the effectiveness and efficiency of the graduate in the workplace.
- Understand the principles of environmental impact assessment and design appropriate technologies to deal with environmental pollution.
- Undertake the training of human resources to provide environmental education to a wider audience.
- Understand the principles of project management.
- Use appropriate cleaner production technology used elsewhere in the world.
- Use mathematical and computer models for environmental studies.
- Understand the interplay of the different branches of science with sociology and economics and the need to balance economic development with environmental preservation.

Criteria for selection for the Special Degree Programme in Environmental Science

Selection of students to opt for the special degree programme in Environmental Science shall be made at the end of the second academic year.

The minimum requirements necessary to apply for selection to this special degree program are:

- Satisfy the minimum credit requirement for Chemistry as a principal subject at both 100 and 200 levels.
- At least a GPA of 2.50 from at least 32 credits at 100 and 200 levels from two principal subjects including Chemistry and at least Grade C for other course units that are considered for the degree.
- At least Grade C for each of the foundation courses offered.

The following Table shows the summary of courses offered at 300 and 400 levels for the Special Degree programme in Environmental Science:

Course Number	Course Title	No. of Credits	Lecture hrs	Lab hrs	Prerequisites	Compulsory
ES 301	Concepts in Environmental Science (<i>new</i>)	3	45			√
ES 302	Biological Indicators in Environmental Management (same as ZL 306)	2	15	30		
ES 303	Water and Soil Pollution (<i>new</i>)	3	30	30		√
ES 304	Environmental Law and EIA (<i>new</i>)	2	30			√
ES 305	Remote Sensing and GIS (same as GL 316)	2	15	30		√
ES 306	Ecosystems of Sri Lanka: Their Ecology and Conservation (same as BT 310)	2	15	30		
ES 307	Wetlands and their Exploitation (<i>new</i>)	2	15	30		
ES 308	Marine Resources and Marine Pollution (<i>new</i>)	2	15	30		
ES 309	Analytical Chemistry (same as CH 341)	3	45		CH 231	√
ES 310	Hydrology (same as GL 309)	2	30			
ES 311	Mining and the Environment (<i>new</i>)	2	30			
ES 312	Biodiversity, Conservation and Management (same as BT 309)	2	15	30		
ES 313	Energy, Weather and Environment	3	30	30		√
ES 314	Geological Environment and Earth Resources (<i>new</i>)	2	30			
ES 315	Advanced Microbiology (same as BT 302)	2	15	30		
ES 316	Mathematics for Environmental Modeling	3	45			
	Total credits of the third year courses	37				
ES 401	Geologic and Hydrologic Hazards (same as GL 417)	2	20	20		√
ES 402	Cleaner Production for Industry (same as AS 432)	2	30			
ES 403	Environmental Management and Sustainable Development (<i>new</i>)	2	30			√
ES 404	Air and noise Pollution (<i>new</i>)	3	30	30		√
ES 405	Waste and Waste Management (<i>new</i>)	3	30	30		√
ES 406	Environmental Analysis Laboratory (<i>new</i>)	2		60	ES 309, CH 238	√
ES 407	Ecotourism and Nature Conservation (same as ZL 405)	3	30	30		
ES 408	Biodiversity and Conservation Biology (same as ZL 412)	3	30	30		
ES 409	Oceanography and Coastal Geomorphology (same as GL 406)	3	45			
ES 410	Environmental Biotechnology (same as MB 416)	2	30			
ES 411	Medical Geology and Environmental Toxicology (<i>new</i>)	2	30			
ES 412	Nanotechnology and the Environment (<i>new</i>)	2	30			

ES 413	Environmental Economics (<i>new</i>)	2	30			
ES 414	Applied Microbiology (same as BT 412)	2	15	30	BT 302	
ES 415	Research Methodology & Scientific Writing (same as AS 402)	2	30			√
ES 416	Seminar	1	--			√
ES 417	Research Project	6		180		√
	Total credits of the forth year courses	42				

Note 1: Students who have **not** offered computer science and statistics as principal subjects opting to follow the Special Degree in Environmental Science are **required** to take the following courses to fulfill their course requirements.

BC 201: Basic Computing I
 BC 301: Basic Computing II
 ST 202: Applied Statistics