Module code	SP-4302			
Module Title	Environmental Physics			
Degree/Diploma	Bachelor of Science (Applied Physics)			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	8	hours/week
		Contact hours	4	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

The module is designed for students to understand the physics principles underpinning the environment.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	40%	- describe the basic physical principles that govern the atmosphere, atmospheric motions, transport of pollution, radioactivity and techniques in Environmental Physics
Middle order :	40%	- apply these principles in analysing various systems concerning the atmosphere and its motion, transport of pollution and radioacitivty using quantitative methods
Higher order:	20%	- evaluate example scenarios pertaining to energy balance, atmospheric stability, pollutant dispersion, radioactivity and meteorological measurements - Present case studies or current issues on the environment

Module Contents

- *The Atmosphere*: evolution of the earth's atmosphere, formation of ozone layer, thermal structure of terrestrial systems, Runaway Greenhouse effect, thermal layers of the atmosphere, influence of solar radiations on earth atmosphere, diffuse solar adiations and controlling factors, distribution of sunshine hours, effect of geomagnetic disturbances.
- *Atmospheric Motions*: Atmospheric thermodynamics and radiation theory, equation of motion for the atmosphere, tropical motion systems. global electric circuit, Solar modulation of atmospheric electrification, Global circulation model, numerical weather forecasting.
- *Transport of Pollution*: Atmospheric stability, temperature inversion, dispersion equation. Gaussian plume model – dry deposition of pollutant from stacks.
- *Radioactivity:* Characteristics of radioactive radiations, measurement and application of radio-isotopes, units of radiation dose, biological effects of nuclear radiation and safety measures.
- *Techniques in Environmental Physics*: Common weather and Doppler radar, SODAR, LASER, LIDAR, biosensors - principles and applications, bio-acoustic - perception of loudness, combination of tones – sound analysis, noise pollution index, interference level and measurement of noise level. Ultrasound imaging and applications.

Assessment	Formative assessment	In-class questions and feedback
	Summative assessment	Examination: 60%
		Coursework: 40% - 2 reports (20%) - 1 class test (10%) - 1 project (10%)