

# **SYLLABUS & PROGRAMME STRUCTURE**

## **Environmental Science**

**(General)**

**(Choice Based Credit System)**

(Effective from the Academic Session 2017-2018)

**Third Semester**

**MAHARAJA BIR BIKRAM UNIVERSITY  
AGARTALA, TRIPURA: 799004**

## PROGRAMME STRUCTURE

### Structure of Proposed CBCS Syllabus for BA/BCom (General)

Semester	Core Course (12)	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Course (SEC) (2)	Discipline Specific Elective (DSE) (4)	Generic Elective (GE) (2)
1	Compulsory English-1	AECC1 : Environmental Science			
	DSC- 1 A (Paper-I of choice of subject-I)				
	DSC- 2 A (Paper-I of choice of subject-II)				
2	Compulsory English-2	AECC2 : (English/MIL) (English/Bengali/Kok borak/Hindi) (Communication)			
	DSC- 1 B (Paper-II of choice of subject-I)				
	DSC- 2 B (Paper-II of choice of subject-II)				
3	Compulsory MIL-1 (Alternative English/Bengali/Kokborak/Hin di)		SEC1 (From Choice of subject-I)		
	DSC- 1 C (Paper-III of choice of subject-I)				
	DSC- 2 C (Paper-III of choice of subject-II)				
4	Compulsory MIL-2 (Alternative English/Bengali/Kokborak/Hin di)		SEC2 (From Choice of subject-II)		
	DSC- 1D (Paper-IV of choice of subject-I)				
	DSC- 2D (Paper-IV of choice of subject-II)				
5			SEC3 (From Choice of subject-I)	DSE1A (From Choice of subject-I)	GE-1 (From Choice of subject-I)
				DSE2A (From Choice of subject-II)	
6			SEC4 (From Choice of subject-II)	DSE1B (From Choice of subject-I)	GE-2 (From Choice of subject-II)
				DSE2B (From Choice of subject-II)	

## PROGRAMME STRUCTURE

### Structure of Proposed CBCS Syllabus for B.Sc. (General)

Semester	Core Course (12)	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Course (SEC) (4)	Discipline Specific Elective (DSE) (6)
1	DSC- 1 A (Paper-I of choice of subject-I)	AECC-1 Environmental Science		
	DSC- 2 A(Paper-I of choice of subject-II)			
	DSC- 3 A(Paper-I of choice of subject-III)			
2	DSC- 1 B(Paper-II of choice of subject-I)	AECC2 (English/MIL (Communication))		
	DSC- 2 B(Paper-II of choice of subject-II)			
	DSC- 3 B(Paper-II of choice of subject-II)			
3	DSC- 1 C(Paper-III of choice of subject-I)		SEC1 (From Subject-1)	
	DSC- 2 C(Paper-III of choice of subject- II)			
	DSC- 3 C(Paper-III of choice of subject- III)			
4	DSC- 1 D(Paper-IV of choice of subject-I)		SEC2 (From Subject-1I)	
	DSC- 2 D(Paper-IV of choice of subject- II)			
	DSC- 3 D(Paper-IV of choice of subject- III)			
5			SEC3 (From Subject-1II)	DSE1A (From Subject-1)
				DSE2A (From Subject-1I)
				DSE3A (From Subject-1II)
6			SEC4 (From any one of Subject-1, II & III) or from the computer course prescribed for BSc (General)	DSE1B (From Subject-1)
				DSE2B (From Subject-1I)
				DSE3B (From Subject-1II)

Environmental Science  
**Semester-III**  
**DSC-Paper - III**

**TOTAL MARKS – 100**  
**End semester- 70, Internal- 30**

**THEORY**

**Unit I**

**Analytical Technique and Bio-statistics**

Principles and application of Titrimetry, Flame photometry, UV-Visible spectrophotometry, Electrophoresis, Gravimetry, Colourimetry, Gas-liquid chromatography, Scanning electron microscopes. Measures of Central tendency (mean, median, mode), Standard Deviation, Standard Error, variance, Sampling theory-hypothesis testing (Student t- test, Least Significant Difference); Types of error Correlation, regression analysis, One way analysis of variance.

**Unit - II**

**Energy and Environment**

Defining energy, Global energy resources; renewable and non-renewable resource, energy conservation; Nature, scope and analysis of local and global impacts of energy use on the environment; fossil fuel burning and related issues of air pollution, greenhouse effect, global warming and, urban heat island effect; Radioactive waste, spent fuel; Energy production, transformation and utilization associated environmental impacts (Chernobyl and Fukushima nuclear accidents, construction of dams, environmental pollution).

**Unit – III**

**Environmental Degradation**

Air pollution- natural and anthropogenic sources of air pollution, sources and types of pollutants (primary and secondary); Ambient air quality standards (NAAQ Standards of India); air quality index; Smog; effects of different pollutants on human health and control measures; indoor air pollution: sources and effects on human health. Water Pollution-Sources of surface and ground water pollution; water quality parameters and standards; Eutrophication; COD, BOD, DO; Soil Pollution-Causes of soil pollution and degradation; effect of soil pollution on environment, vegetation and other life forms; control strategies. Noise pollution – sources, effect and control measures of noise pollution, Marine pollution-sources of marine pollution and its control. Radioactive or Thermal Pollution and its effects on human health.

**Unit – IV**

**Environmental Laws**

Legal definitions (environmental pollution, natural resource, biodiversity, forest, sustainable development); The Indian Forest Act 1927; The Wildlife (Protection) Act 1972; The Water (Prevention and Control of Pollution) Act 1974; The Forests (Conservation) Act 1980; The Air (Prevention and Control of Pollution) Act 1981; The Environment (Protection) Act 1986; Noise Pollution (Regulation and Control) Rules 2000; The Biological Diversity Act 2002; The Schedule Tribes and other Traditional Dwellers (Recognition of Forests Rights) Act 2006; The National Green Tribunal Act 2010; scheme and labelling of environment friendly products, Ecomarks. International Laws and treaties on environmental protection.

## **PRACTICAL**

1. Determination of alkalinity, chloride, calcium and magnesium content, transparency, temperature and conductivity of water samples.
2. Estimation of soil organic carbon of different soil samples.
3. Measurement of ambient noise level.

### ***References:***

1. *Principles of Biophysical chemistry - Uppadahay -Uppadahay -and Nath.*
2. *Analytical Techniques - S.K. Sahani*
3. *Environmental administration & law - Paras Diwaa.*
4. *Environmental planning, policies & programs in India - K.D. Saxena*
5. *Air pollution and control - K.V.S.G. Murlikrishan*
6. *Environment Readers for Universities, ISBN: 978-81-86906-03-3, Published by Centre for Science and Environment, A Down to Earth Publication-New Delhi.*
7. *Industrial noise control - Bell & Bell*
8. *Environmental engineering -Peary*
9. *Introduction to environmental engineering and science - Gilbert Masters.*