

# **SYLLABUS & PROGRAMME STRUCTURE**

## **Environmental Science**

**(General)**

**(Choice Based Credit System)**

(Effective from the Academic Session 2017-2018)

**Second Semester**

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

## PROGRAMME STRUCTURE

### Structure of Proposed CBCS Syllabus for B.A/B.Com (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-II)
				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)

**SEMESTER – II**  
**DSC - PAPER – II (Theory)**

TOTAL MARKS – 100  
Theory – 70 (End semester- 60, Internal- 10)  
Practical-30 (End semester- 20, Internal- 10)

**Unit-I-Biodiversity Conservation**

1. Concept of Biodiversity, hierarchical levels (genetic diversity, species diversity, ecosystem diversity); Gradients of biodiversity (Latitudinal change); Biodiversity as a resource; Causes of biodiversity loss, , Rare, Threatened and Endangered flora and fauna, Concept of Endemism and Invasive species, Global Biodiversity Hotspots, Strategies for Biodiversity Conservation Ex-situ, In-situ (Wild life sanctuaries, National Parks and Biosphere reserves, Gene and Seed bank), Biodiversity documentation, Convention on Biological Diversity; role of local communities and traditional knowledge in conservation;
2. India as a mega diversity nation; phytogeographic and zoogeographic zones of the country; forest types and forest cover in India; National Biodiversity Action Plan.

LECTURES-15

**Unit-II-Environmental Chemistry**

Laws of thermodynamics, Chemical composition of Earth, Chemical composition of Air , water and Soil; Biogeochemical cycles; some important chemical processes (pyrolysis, fermentation, degradation pathways of organochemicals), Chemical nature of pesticides, surfactants, heavy metals, Photo Chemical Smog, Ozone Chemistry, Acid Rain,

LECTURES-18

**Unit-III-Atmosphere and global climate change**

1. Atmospheric structure and composition; southern oscillation; western disturbances; El Nino and La Nina; tropical cyclone; effect of urbanization on micro climate; Asian brown clouds.
2. Trends of global warming and climate change; drivers of global warming and the potential of different green house gases (GHGs) causing the climate change; impact of climate change on atmosphere, weather patterns, sea level rise, agricultural productivity and range shift of species; impact on economy and spread of human diseases.
3. Ozone layer or ozone shield; importance of ozone layer; ozone layer depletion and causes; ozone depleting substances (ODS); effects of ozone depletion; mitigation measures and international protocols.

LECTURES-18

**Unit I V: Climate change and policy**

Environmental policy debate; International agreements; Montreal protocol 1987; Kyoto protocol 1997; Convention on Climate Change; carbon credit and carbon trading; clean development mechanism.

LECTURES-09

## **Practical**

1. Simpson diversity index for measurement of diversity, evenness and dominance.
2. Measurement of soil: bulk density, water holding capacity, temperature, moisture content, texture, pH.
3. Identification of greenhouse gases (GHGs) sources in different rural and urban environment.

## **Suggested Readings**

1. Manhan, S. E. 2000. *Fundamentals of Environmental Chemistry*. CRC Press.
2. De, A.K. 2004. *Environmental Chemistry*. New Age International Pvt. Ltd., New Delhi.
3. Cunningham, W.P. and Cunningham, M. 2011. *Environmental Science: A Global Concern*. McGrawHill, Boston. 6
4. Santra, S.C. 2005. *Environmental Science. Second Edition*. New Central Book Agency (P) Ltd., Kolkata
5. Singh, J. S., Singh, S.P. & Gupta, S. 2006. *Ecology, Environment and Resource Conservation*. Anamaya Publications, New Delhi.
6. Krishnamurthy, K.V. 2004. *An Advanced Text Book of Biodiversity - Principles and Practices*. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi
7. Barry, R. G. 2003. *Atmosphere, Weather and Climate*. Routledge Press, UK.
8. Gillespie, A. 2006. *Climate Change, Ozone Depletion and Air Pollution: Legal Commentaries with Policy and Science Considerations*. MartinusNijhoff Publishers.