



**STATE EDUCATION POLICY-
2024-25
(SEP-2024)**

**ENVIRONMENTAL SCIENCE
Syllabus of 1st and 2nd Semester**

Submitted

to

**Davangere University
Davangere-577 007**

Department of Studies in Environmental science
Davangere University
Discipline Core Paper Structure (DSC)

Sem	Course Category	Course Code	Course Title	Credits Assigned	Instructional Hours per week		Duration of the exam	Exam/ Evaluation pattern (Marks)		
					Theory	Practical		IA	Exam	Total
I	DSC	EVSC1-T	Atmosphere and Climate Change	4	4		3	20	80	100
		EVSC2-P	Atmosphere and Climate Change	2		4	3	10	40	50
II	DSC	EVSC3-T	Ecology and Environment	4	4		3	20	80	100
		EVSC4-P	Ecology and Environment	2		4	3	10	40	50
	Computer subject		Environmental Studies (Common paper for 1 semester BBM/B.com and 2 nd semester BA/ B.sc/B.CA)	3	4		3	20	80	100
III	DSC	EVSC5-T		4	4		3	20	80	100
		EVSC6-P		2		4	3	10	40	50
IV	DSC	EVSC7-T		4	4		3	20	80	100
		EVSC8-P		2		4	3	10	40	50

PROGRAMME SPECIFIC OUTCOME OF B.Sc. ENVIRONMENTAL SCIENCE PROGRAMME

PSO1: Ability to recognize the need for learning the topic and develop foundational knowledge on the topic

PSO2: Acquisition of knowledge on structure, to develop critical thinking and problem solving skills to solve interdisciplinary issues related to the topic.

PSO3: Understanding of various. The relationships between natural and man-made systems

PSO4: Understanding of the major elements of variation that exist in the living world through apply technical methods and innovative techniques in classroom, field and laboratory to analyze scientific data

PSO5: Ability to develop lifelong learning and professional skills

PSO6: Ability to design and execute a scientific project, write scientific reports, develop research and communication skills

PSO7: Ability to spread awareness about the environment around us, sustainable development and conduct outreach activities

PSO8: Internalization of the concept of conservation and evolution through the channel of spirit of inquiry.

PSO9: Ability to gain empirical knowledge on the topic and contribute in decision-making processes

ENVIRONMENTAL SCIENCE COURSE OUTCOMES (COs):

Semester I (A-1): Atmosphere and Climate Change

1. Students will understand the Earth's atmosphere, meteorology, pollution, gas emissions, and airborne contaminants thereby the dynamics of atmosphere.
2. Studying climate and a changing climate is important, which will affect people around the world.
3. Analysis of atmospheric circulation and/or temperature alone can be used for modelling or prediction purposes.
4. Climatic Change is important since it helps to determine future climate expectations.
5. Preparing for climate change — also known as climate change adaptation is about reducing the risk of climate change impacts to people, places and resources

Semester II (A-2): Ecology and Environment

1. Acquire new knowledge of the interdependence between people and nature that is vital for food production, maintaining clean air and water, sustaining biodiversity.
2. Understand to maintain a mosaic of habitats that ensures the survival of a rich variety of species and knowledge on ecology, and ecological dynamics.
3. Learn how Biodiversity boosts ecosystem productivity where each species, no matter how small, all have an important role to play.
4. Ability to correlate ecological dynamics and regulation of vital processes on earth as biogeochemical cycles.
5. Ability to interpret ecosystem services, ecological resilience, ecological economics, and landscape ecology.
6. Set up experiments to appreciate concepts of ecology.
7. Critically examine the forces impacting ecosystems viz., climate change, stress, population, consumerism, globalization, land use change

Subject	Atmosphere and Climate Change	Semester	I
Number hr/week	4hours	Total hours	48
Duration of the exam	3 hours	Credits	4

Unit	Content	Hours
I	<p>Introduction to Environmental Science: Definition and Scope. Theoretical and applied aspects of Environmental Science. Types of Environment - Natural and Artificial Environment.</p> <p>Environmental segments: Atmosphere:. Nature, origin and evolution of atmosphere. Atmospheric structure and composition. Hydrosphere- definition, Types and forms precipitation, Bergeron process – Cloud formation and classification. Forms of condensation. Cloud seeding for artificial rain. Lithosphere: Definition. Internal structure of the earth.</p>	12
II	<p>Weather and Climate: Definition, scope and importance. Meteorological parameters - temperature, pressure, precipitation, humidity, wind speed & direction.</p> <p>Nature of solar energy radiations, Insolation-Factors affecting the insolation, transfer of insolation – absorption, scattering. Reflectance, diffusion and transmission. Terrestrial radiation and heat budget of the earth atmosphere. Monsoons Climates – Definition, Tropical cyclone-formation, structure, movement and path and its effects. Anticyclones -characteristics and origin. Thunder storms and tornadoes. Weather forecasting and modification, El Nino and La Nina effect. Indian monsoon climate.</p>	12
III	<p>Greenhouse effect and global warming: Definition, impacts, major greenhouse gases, sources and sinks of greenhouse gases; Urban Heat Islands; global dimming. Carbon foot print.</p> <p>Impacts of global climate change-Increased surface mean temperature, vector borne/zoonotic diseases, forest fire, influence on agriculture, increase in floods and drought, loss of biodiversity and extinction of species, sea level rise. Climate change and food security. Vulnerable populations – The Kiribati story.</p>	12
IV	<p>Climate change and policy frame works: Kyoto protocol 1997;</p> <p>United Nation Framework Convention on climate change (UNFCCC), The United Nations Conference on Environment and Development, Intergovernmental Panel on Climate Change (IPCC), Ministry of Environment, Forests & Climate Change (MoEF&CC), National Action Plan on Climate Change (NAPCC), Agenda 21, The Kyoto protocol, Paris agreement. Overview of Conference of Parties (CoP). Evolution of climate change</p>	12

	negotiations. Copenhagen; Convention on climate change; carbon credit and carbon trading; Earth summit. Green Climate Fund. Role of individuals in achieving Sustainable Development Goals.	
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**I BSc, I Semester, Paper I
Practical Syllabus**

Paper I: Atmosphere and Climate Change

Duration of practical: **4 hours**

Syllabus based on theory paper syllabus

1. Determination of pH of Rain water sample
2. Determination of Humidity: Principle and use of dry & wet bulb thermometer.
3. Pressure: Aneroid barometer
4. Wind: direction and speed –wind vane and anemometer.
5. Construction of wind rose diagram
6. Demonstration of Rain gauge.
7. Mean rainfall calculation over a drainage basin using Thiessen's Polygon method and Isohyetal method.
8. Demonstration of Altimeter
9. Evaporation & transpiration problems.
10. Determination of solar radiation.
11. Measurement of noise level in different localities.

***Visit to any regional Meteorological centre**

Scheme for Practical Examination for Ist Semester

Practical Internal Assessment (10 Marks)

(MAX MARKS: 50)

Time: **3hours**

Max Marks **40**

I. Major Experiment

20 Marks

(Preparation, Identification/ Estimation/Quantification)

II. Identification and Comments

10 Marks

III. Record

05 Marks

IV. Viva voce examination

05 Marks

Subject	Ecology and Environment	Semester	II
Number hr/week	4hours	Total hours	48
Duration of the exam	3 hours	Credits	4

Unit	Content	Hours
I	<p>Fundamentals of Ecology: Definition, types of ecosystem. Structure and function of an ecosystem – abiotic and biotic components of an ecosystem. Energy flow – Laws of Thermodynamics in relation to energy flow. Food chain - Grazing and detritus. Food web. Ecological pyramids - Pyramid of number, biomass and energy. Productivity - Primary secondary and net productivity. Bio magnification.</p> <p>Major Ecosystem: Types and characteristics of Terrestrial ecosystem - Forest ecosystem, Mangrove, grassland, arid land, wetland, aquatic ecosystem-ponds, rivers, estuaries and Marine ecosystem. Crop land ecosystem.</p>	12
II	<p>Abiotic factors: Nature of response of organisms to abiotic factors. Essential elements and limiting factors; Liebig-Black Man Laws of limiting factors and Shelford's Law of Tolerance. Classification of organisms according to temperature tolerance and regulation. Thermal adaptation of plants and animals. Effect of light on plants and animals.</p> <p>Ecological succession – Primary and Secondary succession – Natural and man-influenced succession, – Hydrarch and Xerarch. Ecotone and Edge effect; Ecotypes and Ecophenes; Ecological indicators. Ecological Niche: Concept and Types of niches</p>	12
III	<p>Biogeochemical cycles : Definition, types, organic and biotic phases of geochemical cycles; types of biogeochemical cycles, water cycle, gaseous cycle-the carbon cycle, the nitrogen cycle, oxygen cycle; sedimentary cycles - sulphur cycle and phosphorous cycle.</p>	12
IV	<p>Population Ecology: Population definition, density, natality, mortality, life table, age distribution; age pyramids, sex ratio, biotic potential and environmental resistance; population growth rate, dispersion-emigration, immigration, migration and regulation of population size.</p>	

I BSc, II Semester, Paper II
Practical Syllabus

Paper II: Ecology and Environment

Duration of practical: 4 hours

Syllabus based on theory paper syllabus

1. Demonstration of Microscope
2. Observation and identification of Micro-flora and fauna
3. Observation & Identification of Macro-flora and fauna
4. Study of ecological adaptations, morphology and anatomy of leaf and stem of
 - a. Hydrophytes
 - b. Xerophytes
 - c. Epiphytes
5. Study of plant community- quadrat method and calculate the frequency percentage of different species of plants in an area.
6. A study of artificial ecosystem.
7. Estimation of carbon capture and storage of trees.
8. Estimation of primary productivity of a pond – Light and Dark bottle method
9. Estimation of primary productivity of terrestrial vegetation– chlorophyll method.
10. Estimation of primary productivity of grasses – Harvest method
11. Determination of turbidity of water sample using Sacchi disc.
12. Study of physical parameters of ponds and lakes (Color, odor, temperature and turbidity) water.
13. Visit to national parks/social forestry/urban forestry/ wild life sanctuary/forest ecosystem.

Scheme for Practical Examination for 2nd Semester

Practical Internal Assessment (10 Marks)

(MAX MARKS: 50)

Time: **3hours**

Max Marks **40**

I. Major Experiment

20 Marks

(Preparation, Identification/ Estimation/Quantification)

II. Identification and Comments

10 Marks

III. Record

05 Marks

IV. Viva voce examination

05 Marks

B Sc I Semester Degree Examination, 2024-25
(Semester Scheme, New Syllabus: 2024-25)
Subject **Environmental science/Environmental studies**
Paper: **Atmosphere and Climate Change**
Paper Code:

Time : 3 Hours

Max Marks: 80

Instructions to the Students

1. All sections are compulsory
2. Draw neat and labeled diagrams wherever necessary

SECTION-A

1. Answer **ALL** the following questions (2 x 10= 20)

- a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)
- i)
- j)

SECTION-B

- Answer any **SIX** of the following (5 x 6= 30)

- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

SECTION-C

- Answer any **THREE** of the following (10 x 3= 30)

- 10.
- 11.
- 12.
- 13.



DAVANGERE UNIVERSITY
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No. DUD/DOS-BOS-UG/ 2024-25

18 June 2024

UG- BOS Proceedings

The UG-BOS meeting was conducted on 18th June 2024 in the Department of Studies in Environmental science, Davangere University, Shivangotri at 11 am to discuss and finalize SEP-2024 BSc Environmental science syllabus and the following BOS members were present as follows;

Sl. No.	Members		Signature
1	Prof Govindappa M	Chairman	
2	Dr. Veeresh SJ	Internal member	
3	Dr. Sharadadevi Kallimani	Internal member	
4	Dr. S.Thirumala	Internal member	
5	Prof Narayana J	External member	

The UG-BOS Environmental Science chairman welcomed the members, briefed the agendas and approved the following,

- All the members approved the 1st and 2nd semester SEP BSc Environmental Science syllabus and approved.
- The question paper pattern was discussed (made according to SEP-2024 format) and approved.
- The allocations of credits and internal marks verified and approved.
- The practical class syllabus, internal marks was discussed and approved the same.
- The practical internal marks verified (attendance-05 and record-05) and approved. The practical exam should be conducted for 3 hours.
- Dr Veeresh SJ submitted the vote of thanks.

(Prof Govindappa M)

Chairman-BOS-UG

Department of Studies in Environmental Science

Davangere University, Davanagere, Karnataka, India