

ಮಂಗಳೂರು
MANGALORE



ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
UNIVERSITY

ಕ್ರಮಾಂಕ/No: MU/ACC/CR 7/2024-25/A8

ಕುಲಸಚಿವರ ಕಛೇರಿ
ಮಂಗಳಗಂಗೋತ್ರಿ- 574 199
Office of the Registrar
Mangalagangothri – 574 199
ದಿನಾಂಕ/Date: 09/07/2026

NOTIFICATION

Sub: Syllabi of UG Programmes/Courses under the Faculty of Science and
Technology as per the SEP guidelines reg.

Ref: Decision of the Academic Council meeting dated: 29.06.2026

Pursuant to the above the syllabi of following UG programmes/Courses, prepared in accordance with the guidelines of the SEP commission and approved by the Academic Council at its meeting held on 29.06.2026 are hereby notified for implementation with effect from the academic year 2026-27 .

Sl.No.	UG Programmes/Courses
1.	B.Sc (Food Technology)(V -VI sem)
2.	B.Sc.(Food Nutrition and Dietetics) (V-VI sem)
3.	B.Sc(Animation & Visual Effects) (V -VI sem)
4.	BCA (V -VI sem)
5.	BCA (Data Analytics) (V -VI sem)
6.	BCA(Artificial intelligence and Machine Learning) (V -VI sem)
7.	B.Sc (Fashion Design) (V-VI sem)
8.	Computer Science-(V-VI sem)
9.	Biotechnology-(V-VI sem)
10.	Microbiology (changes in skill courses)
11.	Environmental Science(I-II sem)

Copy of the syllabi shall be downloaded from the Mangalore University website
www.mangaloreuniversity.ac.in


REGISTRAR.

To:

- 1) The Registrar(Evaluation),Mangalore University.
- 2) The Chairpersons, U.G BOS in concerned subjects, Mangalore University.
- 3) The Director, College Development Council, Mangalore University.
- 4) The Principal's of all affiliated/Constituent colleges of Mangalore University.
- 5) The Director, computer centre, Mangalore University.
- 6) The Assistant Registrar/The superintendent, Academic section, O/O the Registrar,
Mangalore university.
- 7) Guard file.

MANGALORE UNIVERSITY
GREE COURSE PATTERN AND SCHEME OF EXAM
STATE EDUCATION POLICY (SEP-2026)
CORE SUBJECT: ENVIRONMENTAL SCIENCE

Core/ Elective	Course Code	Title of the course	Instructi on Hours	Duration of the Examination (Hrs)	Max. Marks			Credits
					Exam	IA	Total	
I Semester								
Group I Core Subject	Theory	Fundamentals of Environmental Sciences	4	3	80	20	100	3
	Practical	Fundamentals of Environmental Sciences	4	3	40	10	50	2
Total number of Credits for Core Subject in I Semester:05								
II Semester								
Group I Core Subject	Theory	Environmental Chemistry	4	3	80	20	100	3
	Practical	Environmental Chemistry	4	3	40	10	50	2
Total number of Credits for Core Subject in II Semester:05								
III Semester								
Group I Core Subject	Theory	Environmental Biology	4	3	80	20	100	3
	Practical	Environmental Biology	4	3	40	10	50	2
Group II Elective/ Optional	BSCZOE S 302	Wastes to Treasures	2	2	40	10	50	2
Total number of Credits for Core Subject in IIIS emester:07								
IV Semester B.Sc.								
Group I Core Subject	Theory	Environmental Geosciences	4	3	80	20	100	3
	Practical	Environmental Geosciences	4	3	40	10	50	2
Group II Elective/ Optional	Theory	Contemporar y Environment al Issues	2	2	40	10	50	2
Total number of Credits for Core Subject in IV Semester: 07								

V Semester B.Sc.								
Group I Core Subject	Theory	Energy and Environment	3	3	80	20	100	3
	Theory	Environmental Pollution and Control	3	3	80	20	100	3
	Practical	Energy and Environment; Environmental Pollution and Control	4	4	40	10	50	2
Total number of Credits for Core Subject in V Semester: 08								
VI Semester B.Sc.								
Group I Core Subject	Theory	Solid and Hazardous Waste Management	3	3	80	20	100	3
	Theory	Environmental Assessment, Management and Legislation	3	3	80	20	100	3
	Practical	Solid and Hazardous Waste Management Environmental Assessment, Management and Legislation	4	4	40	10	50	2
Total teaching hours			Theory-32 Practical-24					
Total number of Credits for Core Subject in VI Semester:10								
Total number of Credits for Core Subject in I-VI Semesters:42								
Group II Compulsory course		Skill enhancement programme - Project work/Field training	3	3	40	10	50	2
Compulsory Course to be Offered Either in IV/V/VI Semester by Respective Colleges.								

MANGALORE UNIVERSITY
STATE EDUCATION POLICY(SEP-2026)
B.Sc. DEGREE–ENVIRONMENTAL SCIENCE

Program Name	B.Sc.	SEMESTER	I
Course Title	Fundamentals of Environmental Sciences (THEORY)		
Course Code:		No. of Credits	3
Contact hours	48 Hrs (4hours/week)	Duration of SEA/Exam	3Hrs.
Formative assessment marks	20	Summative assessment marks	80

Unit 1: Foundations of Environmental Science (12 Hours)

Introduction to Environmental Science (4 hrs)

Definition, scope, and importance of Environmental Science. Inter disciplinary nature of Environmental Science. Historical development of environmental awareness.

Components of the Environment (4 hrs)

Atmosphere: layers and composition. Hydrosphere: distribution of water and hydrological cycle. Lithosphere: structure of Earth, rocks, and soils. Biosphere: concept and importance.

Ecosystems (4 hrs)

Structure and functions of ecosystems; Producers, consumers, and decomposers. Food chains and food webs. Ecological pyramids.

Unit 2: Environmental Chemistry and Natural Cycles (12 Hours)

Basic Environmental Chemistry (4 hrs)

Matter and energy in the environment. Physical and chemical properties of air, water and soil. Introduction to pollutants.

Energy Flow in Ecosystems (4 hrs)

Concept of energy. Food chains and trophic levels. Energy transfer between trophic levels.

Biogeo-chemical Cycles (4 hrs)

Water cycle. Carbon cycle. Nitrogen cycle. Oxygen cycle. Human impacts on natural cycles.

Unit 3: Weather, Climate, and Atmosphere (12 Hours)

Weather and Climate (4 hrs)

Difference between weather and climate. Elements of weather – Temperature, Atmospheric pressure, Humidity, Rainfall, Wind.

Atmospheric Processes (4 hrs)

Solar radiation and Earth's heat balance. Clouds and precipitation. Local and global wind systems (Insolation; Heat Balance; Condensation; Precipitation; Global Wind Circulation)

Climate Change (4 hrs)

Greenhouse effect. Global warming. Causes and impacts of climate change. Human Influence on Climate - Urban heat island effect; Deforestation and climate; Climate adaptation and mitigation.

Unit 4: Sustainability and Environmental Ethics (12 Hours)

Biogeography (4 hrs)

Major biomes of the world. Biogeographic zones of India and their characteristic flora and fauna. Major biomes of the world: Forests, Grasslands, Deserts, Tundra, and Aquatic biomes.

Sustainable Development (4 hrs)

Concept and principles of sustainable development. Sustainable Development Goals (SDGs). Carrying capacity and ecological footprint (basic concepts).

Environmental Education and Ethics (4 hrs)

Environmental education and awareness. Environmental ethics. Environmental movements in India: Chipko Movement, Narmada Bachao Andolan. Individual responsibilities towards the environment.

References

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5. Basu, M., & Xavier Savarimuthu, S. J. (2015). *Fundamentals of environmental studies*. Cambridge University Press India.
6. Bharucha, E. (2019). *Textbook of environmental studies for undergraduate courses* (2nd ed.). Universities Press.
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11. Hargrove, E. C. (1989). *Foundations of environmental ethics*. Prentice Hall.
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14. Mishra, D. D. (2010). *Fundamentals of environmental studies* (2nd ed.). S. Chand Publishing.
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16. Saxena, H. M. (2019). *Environmental studies*. Rawat Publications.
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Program Name	B.Sc.	SEMESTER	I
Course Title	Fundamentals of Environmental Sciences (PRACTICAL)		
Course Code:		No. of Credits	2
Contact hours	4Hrs/week	Duration of SEA/Exam	3 Hrs
Formative assessment marks	10	Summative assessment marks	40

1. Study of environmental components using maps, charts, and models (Atmosphere, Hydrosphere, Lithosphere, Biosphere).
2. Identification and classification of ecosystem components (producers, consumers, and decomposers) in a local ecosystem.
3. Preparation and interpretation of food chains, food webs, and ecological pyramids.
4. Determination of basic physic chemical properties of water (pH, temperature, turbidity, and dissolved solids).
5. Analysis of soil characteristics (soil texture, moisture content, and pH).
6. Demonstration of energy flow through trophic levels using ecological models.
7. Preparation and interpretation of biogeo-chemical cycle diagrams (water, carbon, nitrogen, and oxygen cycles).
8. Measurement and recording of weather parameters (temperature, humidity, rainfall, atmospheric pressure, and wind direction).
9. Observation and identification of cloud types and precipitation forms.
10. Field study of local climatic conditions and urban heat island effects.
11. Biodiversity assessment of a selected terrestrial or aquatic habitat.
12. Field visit and report on environmental conservation initiatives, sustainable practices, or Environmental awareness programs.

Note: 1. Question must be framed as per the scheme provided
2. Internal assessment marks to be allotted after conducting one practical test at the end of the semester.

Program Name	B.Sc.	SEMESTER	II
Course Title	Environmental Chemistry (Theory)		
Course Code:		No. of Credits	3
Contact hours	48Hrs (4hours/week)	Duration of SEA/Exam	3Hrs
Formative assessment marks	20	Summative assessment marks	80

Unit 1: Aquatic Chemistry & Water Quality (12 Hours)

Basic Chemical Principles (4 Hours)

Periodic properties, stoichiometry, chemical equilibrium, Gibbs free energy, and reaction kinetics.

Properties of Water and Gas Solubility (4 Hours)

Henry's Law, carbonate system, pH, alkalinity and buffering, redox processes, and chemical speciation in water.

Water Quality Parameters (4 Hours)

DO, BOD, COD, and principles of water treatment: coagulation, filtration, and disinfection.

Unit 2: Atmospheric Chemistry & Air Pollution (12 Hours)

Atmospheric Layers and Radicals (4 Hours)

Composition and structure of the atmosphere, atmospheric photochemistry, and the role of radicals.

Ozone Dynamics and Depletion (4 Hours)

Ozone formation and depletion (Chapman cycle, CFCs, and NO_x).

Particulate Matter and Photochemical Smog (4 Hours)

Formation of sulfates, nitrates, and secondary organic aerosols (SOA); photochemical smog: ozone, PAN, and VOC oxidation.

Unit 3: Soil Chemistry, Biogeochemical Cycles & Organic Pollutants (12 Hours)

Soil Composition (4 Hours)

Humic substances, fulvic acid, cation exchange capacity (CEC), clay, and minerals.

Major Biogeochemical Cycles (4 Hours)

Carbon, nitrogen, phosphorus, and sulfur cycles; hydrocarbons and persistent organic pollutants (POPs); Stockholm Convention.

Pesticides and Radiation Hazards (4 Hours)

Pesticide classes, persistence, bioaccumulation, biomagnification, and basics of environmental radioactivity and radiation hazards.

Unit 4: Environmental Toxicology (12 Hours)

Toxicity of Major Heavy Metals (4 Hours)

Toxicity of major heavy metals (Pb, Cd, Hg, and Cr), enzyme inhibition, Minamata disease, and Itai-Itai disease.

Metalloids and Gaseous Toxins (4 Hours)

Health effects of CO, O₃, PAN, and VOCs; arsenicosis, selenosis, carbon monoxide poisoning, carboxy hemoglobin formation, ozone toxicity, and VOC-related health effects.

Major Airborne Carcinogens (4 Hours)

Polycyclic aromatic hydrocarbons (PAHs), benzene, DNA adducts, and mutagenicity.

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13. Stanley, E. M., & Manahan, S. E. (2010). *Fundamentals of environmental chemistry* (3rd ed.). CRC Press.
14. Trivedi, P. R., & Goel, P. K. (2010). *Environmental pollution and control*. Karad Environmental Publications.
15. Van Loon, G. W., & Duffy, S. J. (2017). *Environmental chemistry: A global perspective* (4th ed.). Oxford University Press.

Program Name	B.Sc.	SEMESTER	II
Course Title	ENVIRONMENTAL CHEMISTRY (PRACTICAL)		
Course Code:		No. of Credits	2
Contact hours	4 Hrs/week	Duration of SEA/Exam	3Hrs
Formative assessment marks	10	Summative assessment marks	40

1. Estimation of Total Alkalinity and Acidity (Carbonate system dynamics)
2. Determination of Dissolved Oxygen (DO) (Winkler titrimetric method)
3. Measurement of Biochemical Oxygen Demand (BOD) (5-day incubation test)
4. Determination of Chemical Oxygen Demand (COD) (Dichromate reflux method)
5. Water Purification via Coagulation and Flocculation (Jar test optimization)
6. Analysis of Free and Residual Chlorine (Spectrophotometric/iodometric titration)
7. Determination of Cation Exchange Capacity (CEC) of Soil (Ammonium acetate method)
8. Extraction and Spectrophotometric Analysis of Soil Humic Acids (Isolation of organic fractions)
9. Analysis of Airborne Particulate Matter (PM_{2.5}/PM₁₀) (Gravimetric high-volume sampling)
10. Spectrophotometric Determination of Nitrates and Sulfates (Water/soil nutrient metrics)
11. Colorimetric Estimation of Heavy Metals (Cr(VI) or Pb) (Diphenylcarbazide/dithizone complexes)
12. Analysis of Volatile Organic Compounds (VOCs) / Polycyclic Aromatic Hydrocarbons (PAHs)

SCHEME OF EXAMINATION: B.Sc. – I to VI SEMESTERS (THEORY)

CORE SUBJECT: ENVIRONMENTAL SCIENCE

Question No.	PART-A	Marks
I	Answer any TEN Questions out of TWELVE Questions (Give 3 questions from each unit)	10x2=20
	PART-B	
	Unit-I	
II	4 Marks Questions (Answer any TWO out of THREE)	4x2=8
III	7 Marks Questions (Answer any ONE out of TWO)	7x1=7
	Unit-II	
IV	4 Marks Questions (Answer any TWO out of THREE)	4x2=8
V	7 Marks Questions (Answer any ONE out of TWO)	7x1=7
	Unit-III	
VI	4 Marks Questions (Answer any TWO out of THREE)	4x2=8
VII	7 Marks Questions (Answer any ONE out of TWO)	7x1=7
	Unit-IV	
VIII	4 Marks Questions (Answer any TWO out of THREE)	4x2=8
IX	7Marks Questions (Answer any ONE out of TWO)	7x1=7