DIPLOMA IN
ENVOIRNMENTAL ENGINEERING
CURRICULUM BASED ON CREDIT SYSTEM

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PROGRAMME GUIDELINES	
PROGRAMME TITLE	**DIPLOMA IN ENVOIRNMENTAL ENGINEERING**
TOTAL CREDITS	**15 Credits**
TOTAL LEARNING HOURS	**150 Hours**
GUIDED LEARNING HOURS	**45 Hours**

Total Learning Hour - 150 Hours

Guided Learning Hour – 45 Hours

1 Credit = 10 hours of effort (10 hours of learning time which includes everything a learner has to do to achieve the outcomes in a qualification including the teaching learning process, assessment procedures and practical's).

LIST OF UNITS

S. No.	Unit Title	Unit Specification	Credits
1	Environmental Science and Ecology	Essential Unit	3
2	Water Resources Management	Essential Unit	3
3	Waste Management and Pollution Control	Essential Unit	3
4	Environmental Engineering Design	Essential Unit	3
5	Environmental Policy and Regulation	Essential Unit	3
TOTAL CREDITS			**15**

UNIT TITLE	Environmental Science and Ecology
CREDIT	3
SPECIFICATION	Essential Unit

UNIT DESCRIPTION

This subject provides an overview of the fundamental principles of environmental science and ecology, focusing on ecosystems, biodiversity, and the relationships between organisms and their environments. It emphasizes the importance of sustainable practices in preserving ecological balance.

UNIT LEARNING OUTCOMES

1. **Explain key ecological concepts and their significance in environmental management.**

- ✓ Ecosystem structure and function.
- ✓ Food webs and trophic levels.
- ✓ Biodiversity and its significance.

2. **Assess the impact of human activities on biodiversity and ecosystems.**

- ✓ Habitat destruction and fragmentation.
- ✓ Pollution types and their effects on organisms.
- ✓ Climate change implications on biodiversity

3. **Propose sustainable solutions to ecological challenges.**

- ✓ Conservation strategies and practices.
- ✓ Restoration ecology principles.
- ✓ Community involvement in sustainability efforts.

Indicative Study Reference Text Books

1. Miller, G.T. and Spoolman, S. (2017) *Environmental Science*. 15th edn. Cengage Learning.
2. Odum, E.P. and Barrett, G.W. (2005) *Fundamentals of Ecology*. 5th edn. Thomson Brooks/Cole.
3. Krebs, C.J. (2016) *Ecology*. 6th edn. Benjamin Cummings.

UNIT TITLE	Water Resources Management
CREDIT	3
SPECIFICATION	Essential Unit

UNIT DESCRIPTION

This subject focuses on the sustainable management of water resources, covering water quality assessment, hydrology, and the effects of pollution. Students will explore strategies for conservation and efficient water use.

UNIT LEARNING OUTCOMES

1. **Analyze water quality parameters.**

- ✓ Key water quality indicators (pH, turbidity, dissolved oxygen).
- ✓ Methods for water quality testing and analysis.
- ✓ Standards and regulations for drinking water quality.

2. **Describe the hydrological cycle and its significance.**

- ✓ Components of the hydrological cycle (precipitation, evaporation, infiltration).
- ✓ The role of watersheds in water management.
- ✓ Impacts of urbanization on hydrology.

3. **Develop sustainable water management strategies.**

- ✓ Techniques for water conservation (rainwater harvesting, greywater reuse).
- ✓ Integrated Water Resources Management (IWRM) principles.
- ✓ Policies for sustainable water governance.

Indicative Study Reference Text Books

1. Mays, L.W. (2011) *Water Resources Engineering*. 2nd edn. Wiley.
2. Gleick, P.H. (2014) *Water: The Global Crisis*. University of California Press.
3. Pritchett, J. (2018) *Water Resource Management: A Sustainable Approach*. Springer.

UNIT TITLE	Waste Management and Pollution Control
CREDIT	3
SPECIFICATION	Essential Unit

UNIT DESCRIPTION

This subject explores the principles and practices of waste management and pollution control. It includes the study of solid and hazardous waste, recycling methods, and technologies for reducing environmental impact.

UNIT LEARNING OUTCOMES

1. **Classify various types of waste and management techniques.**

- ✓ Types of waste - municipal, industrial, hazardous.
- ✓ Waste hierarchy - reduce, reuse, recycle.
- ✓ Landfill design and management practices.

2. **Assess pollution control technologies.**

- ✓ Air pollution control methods (filters, scrubbers).
- ✓ Water treatment technologies (biological, chemical, physical).
- ✓ Soil remediation techniques (bioremediation, phytoremediation).

3. **Design compliant waste management plans.**

- ✓ Regulatory frameworks governing waste management.
- ✓ Stakeholder involvement in waste management planning.
- ✓ Case studies of effective waste management strategies.

Indicative Study Reference Text Books

1. Tchobanoglous, G. and Kreith, F. (2002) *Handbook of Solid Waste Management*. 2nd edn. McGraw-Hill.
2. Siegert, M. (2017) *Pollution Control Technologies*. Springer.
3. Waste Management Association (2016) *Waste Management Practices: Municipal, Hazardous, and Industrial*. Wiley.

UNIT TITLE	Environmental Engineering Design
CREDIT	3
SPECIFICATION	Essential Unit

UNIT DESCRIPTION

This subject introduces students to the principles of designing environmental engineering systems, including water and wastewater treatment, air quality control, and site remediation techniques.

UNIT LEARNING OUTCOMES

1. **Apply engineering principles to design environmental systems.**

- ✓ Design methodologies for water treatment plants.
- ✓ Assessment of wastewater treatment processes.
- ✓ Design considerations for air quality control systems.

2. **Evaluate the sustainability of engineering projects.**

- ✓ Life cycle assessment (LCA) of engineering solutions.
- ✓ Economic and environmental feasibility studies.
- ✓ Sustainable materials and practices in engineering.

3. **Utilize modeling software for system analysis.**

- ✓ Introduction to environmental modeling software (e.g., EPANET, SWMM).
- ✓ Application of software in water distribution and wastewater management.
- ✓ Case studies utilizing modeling for project design.

Indicative Study Reference Text Books

1. Davis, M.L. (2010) *Principles of Environmental Engineering and Science*. 2nd edn. McGraw-Hill.
2. Wright, R.T. and Boorse, D. (2017) *Environmental Science: Toward a Sustainable Future*. 14th edn. Pearson.
3. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G. (1985) *Environmental Engineering*. McGraw-Hill

UNIT TITLE	Environmental Policy and Regulation
CREDIT	3
SPECIFICATION	Essential Unit

UNIT DESCRIPTION

This subject examines the legal and regulatory frameworks governing environmental protection, focusing on international treaties, national laws, and local regulations. It highlights the roles of various stakeholders in environmental governance

UNIT LEARNING OUTCOMES

1. **Understand key environmental policies and regulations.**

- ✓ Overview of environmental legislation (Clean Air Act, Clean Water Act).
- ✓ International environmental agreements (Paris Agreement, Kyoto Protocol).
- ✓ Role of regulatory agencies.

2. **Analyze the effectiveness of environmental laws.**

- ✓ Case studies of environmental policy successes and failures.
- ✓ Impact assessments of environmental regulations.
- ✓ Comparative analysis of policies across regions.

3. **Develop compliance strategies for regulations.**

- ✓ Frameworks for regulatory compliance in engineering projects.
- ✓ Risk assessment and management in environmental regulation.
- ✓ Engaging stakeholders in compliance processes.

Indicative Study Reference Text Books

1. Weale, A. (2016) Environmental Law and Policy. Oxford University Press.
2. Dwyer, J. (2018) Environmental Policy: New Directions for the Twenty-First Century. 9th edn. CQ Press.
3. Fisher, S., and N. A. H. (2013) Environmental Regulation: Law, Science, and Policy. 7th edn. Wolters Kluwer