SIDO KANHU MURMU UNIVERSITY, DUMKA

(A State University recognized under Section 2(f) & 12(B) of the UGC Act, 1956)

FOUR-YEAR UNDER GRADUATE PROGRAMME (FYUGP)

SYLLABUS

OF

MULTIDISCIPLINARY (MDC) COURSE

ON

POLLUTION CONTROL AND WASTE MANAGEMENT

FOR SEMESTER-I

In accordance with the

Implementation of FYUGP in State Universities of

Jharkhand Regulations, 2024

Implemented from
Academic Session 2025-2029 Onwards

Syllabus Committee Meeting Proceedings

A meeting of the Syllabus Committee for the revision and finalization of the POLLUTION CONTROL AND WASTE MANAGEMENT (MULTIDISCIPLINARY COURSE) syllabus for the Four-Year Undergraduate Programme (FYUGP), in accordance with the Implementation of FYUGP in State Universities of Jharkhand Regulations, 2024, was convened on 22.11.25.

The following members of the Syllabus Committee were present in this meeting. The committee unanimously accepted and recommended the syllabi, incorporating major modifications.

Members of the Syllabus Committee:

S. NO.	MEMBERS	SIGNATURE
1.	**Dr. S.K. Singh (Chairperson)** Dean, Faculty of Science, SKMU, Dumka	
2.	**Dr. S.N. Adhikari (Member)** HOD, University Department of Mathematics, SKMU, Dumka	
3.	**Dr. Nilesh Kumar(Member)** HOD, University Department of Zoology, SKMU, Dumka	
4.	**Dr. Rajesh Kumar Yadav (Member)** HOD, University Department of Physics, SKMU, Dumka	
5.	**Dr. S.L. Bondya (Member)** HOD, University Department of Botany, SKMU, Dumka	
6.	**Dr. Anil Kumar (Member)** Assistant Professor, Department of Chemistry, A.S. College. Deoghar, SKMU, Dumka	
7.	**Dr. Indrajeet Kumar (Member)**	

	Assistant Professor, Department of Physics, S.P. College, Dumka, SKMU, Dumka	
8.	**Dr. Uttam Shukla (Member)** NBAP, Department of Mathematics, Madhupur College, Madhupur, SKMU, Dumka	Uttam 22/11/2025
9.	**Dipak Kumar Das (Invitee Member)** Coordinator, NEP, SKMU, Dumka	22/11/25

22/11/25

Dr. S.K. Singh
(Chairperson)

29/11/25

INSTRUCTIONS FOR QUESTION SETTER

1. **End Semester Examination (75 Marks)**

   The **End Semester Examination (ESE)** will be of **75 marks** and will also have **two groups**.

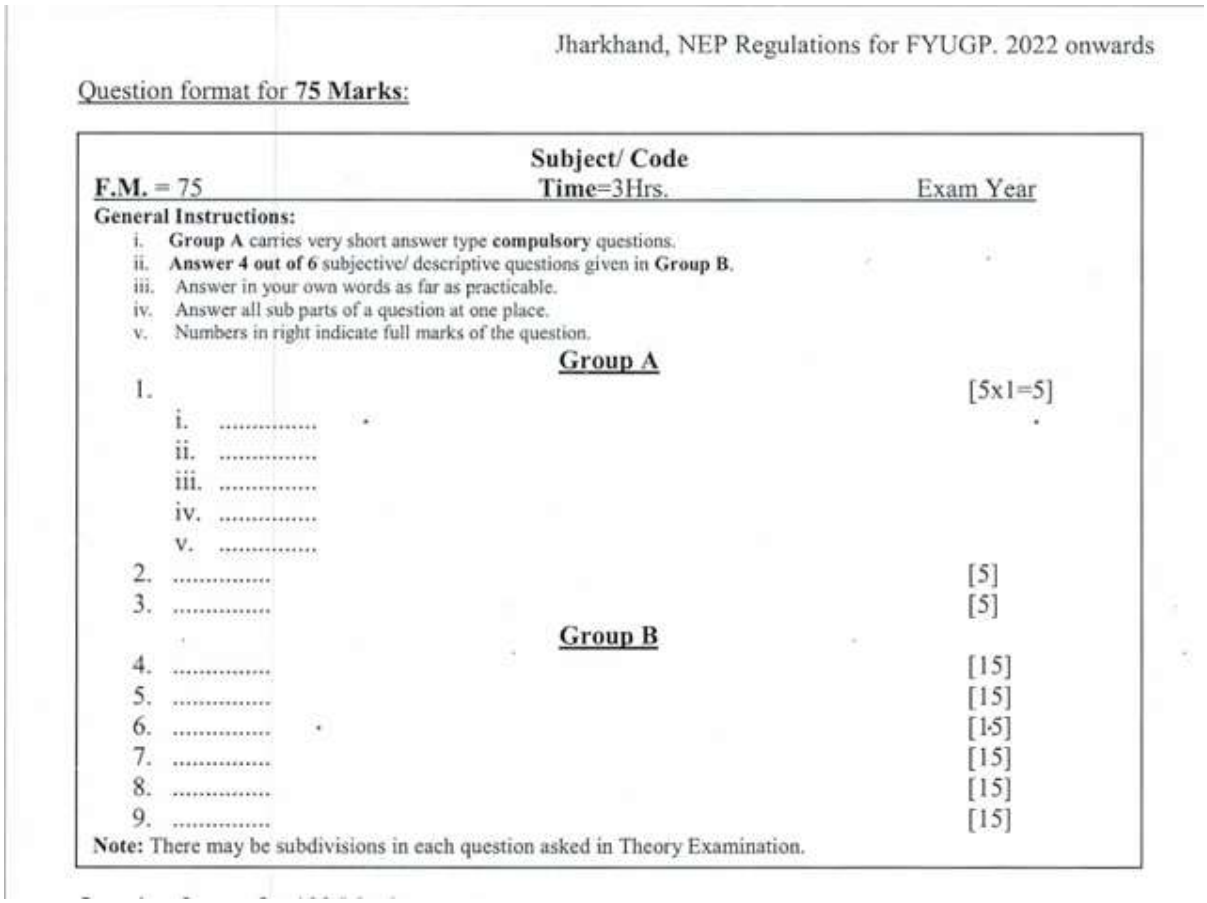
   Group A is compulsory and will have:

   - **Question 1:** Five very short answer questions (1 mark each, total 5 marks)
   - **Questions 2 and 3:** Two short answer questions (5 marks each, total 10 marks)

   Group B will have **six descriptive questions**, each carrying **15 marks**. Students need to answer **any four** (total 60 marks).

   Note: Some questions may be divided into smaller parts if needed.

QUESTION PATTERN:



Jharkhand, NEP Regulations for FYUGP. 2022 onwards

Question format for **75 Marks**:

Subject/ Code

F.M. = 75 **Time**=3Hrs. Exam Year

General Instructions:

i. **Group A** carries very short answer type **compulsory** questions.
ii. **Answer 4 out of 6** subjective/ descriptive questions given in **Group B**.
iii. Answer in your own words as far as practicable.
iv. Answer all sub parts of a question at one place.
v. Numbers in right indicate full marks of the question.

Group A

1.		[5x1=5]
	i.	
	ii.	
	iii.	
	iv.	
	v.	
2.	.....	[5]
3.	.....	[5]

Group B

4.	.....	[15]
5.	.....	[15]
6.	.....	[15]
7.	.....	[15]
8.	.....	[15]
9.	.....	[15]

Note: There may be subdivisions in each question asked in Theory Examination.

SEMESTER – I

COURSE: MULTIDISCIPLINARY (MDC-I) **TOTAL CREDITS:** THEORY-03

PAPER NAME: POLLUTION CONTROL AND WASTE MANAGEMENT **TEACHING HOURS:** THEORY-45

EVALUATION **(Only the End Semester University Examination will be conducted)**	
Full Marks	75 Marks
Duration of Exam	3 Hours
Pass Marks	30 Marks

COURSE OBJECTIVES:

- To provide a broad understanding of environmental pollution, its sources, and control technologies.
- To explore multidisciplinary strategies for managing solid, liquid, and gaseous wastes.
- To familiarize students with the legal, technological, and scientific tools used in pollution monitoring and waste disposal.
- To promote sustainable practices and innovations in pollution control through case studies and current technologies.

COURSE OUTCOMES:

- Identify and categorize different types of environmental pollution and their causes.
- Evaluate techniques for air, water, and soil pollution control.
- Analyze modern waste management strategies including recycling, bioremediation, and e-waste handling.
- Understand and apply environmental laws and policies related to pollution control.
- Integrate interdisciplinary approaches for designing sustainable and eco-friendly waste management systems.

COURSE CONTENTS:

Unit I: Introduction to Pollution and Environment:

Definition and types of pollution; Environmental segments (air, water, soil); Sources and classification of pollutants; Environmental degradation due to urbanization, industrialization, agriculture.

Unit II: Pollution of natural sources and remediation strategies:

Primary and secondary pollutants; Effects of air pollution on health and climate; Air quality standards; Devices for air pollution control (cyclones, scrubbers, electrostatic precipitators, filters); Role of green plants, green-house effect.

Sources of water pollution (domestic, agricultural, industrial); Physicochemical and biological characteristics of wastewater; Primary, secondary, and tertiary water treatment; Eutrophication and control; Role of constructed wetlands, Non-conventional energy sources-bio-energy, solar energy, wind energy.

Classification: biodegradable, non-biodegradable, Sanitation and human health, hazardous; Solid waste collection, segregation, transport; Composting, vermicomposting, landfilling, incineration; Biomedical and radioactive waste; Case studies in solid waste management.

Unit III: Emerging Waste Management Strategies and Policies:

E-waste: sources, hazards, disposal and recycling techniques; Plastic and microplastic waste; Bioremediation and phytoremediation; Policies and laws (EPA 1986, Water Act 1974, Air Act 1981, SWMR 2016). Sustainable development goals (SDGs) and global initiatives (UNEP, IPCC, Basel Convention), national and international pollution control laws and standards.

SUGGESTED READINGS:

1. Environmental Chemistry – A.K. De, 8th Edition, New Age International Publishers
2. Environmental Science: A Global Concern – William P. Cunningham & Mary A. Cunningham, 13th Edition, McGraw Hill Education
3. Waste Management – S.N. Mukhopadhyay, Latest Edition, Oxford & IBH Publishing Co. Pvt. Ltd.
4. Environmental Engineering – Howard S. Peavy, Donald R. Rowe, George Tchobanoglous, 1st Edition, McGraw-Hill Education
5. Air Pollution Control Engineering – Noel de Nevers, 3rd Edition, Waveland Press Inc.
6. Integrated Solid Waste Management – George Tchobanoglous, Hilary Theisen, Samuel A. Vigil, 2nd Edition, McGraw Hill Education
7. Environmental Pollution Control Engineering – C.S. Rao, 3rd Edition, New Age International Publishers
8. Handbook of Solid Waste Management – Frank Kreith & George Tchobanoglous, 2nd Edition, McGraw-Hill Education
9. E-Waste Management – Rakesh Johri (Ed.), 1st Edition, TERI Press
10. Environmental Law and Policy in India – Shyam Divan & Armin Rosencranz, 2nd Edition, Oxford University Press

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