Program	Master of Pharmacy (M.Pharm)	**Semester - 2**
Type of Course	-	
Prerequisite		
Course Objective	-	
Effective From A.Y.	2023-24	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		
Lecture	**Tutorial**	**Lab**	**Credit**	**External Marks (T)**	**Internal Marks (T)**	**External Marks (P)**	**Internal Marks (P)**	**Total Marks**
4	-	-	4	75	25	-	-	100

SEE *- Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**UNIT-1** Multidisciplinary nature of environmental studies: Natural Resources, Renewable and non-renewable resources, Natural resources and associated problems, a) Forest resources; b) Water resources; c) Mineral resources; d) Energy resources; e) Land resources Ecosystems: Concept of an ecosystem and Structure and function of an ecosystem. Environmental hazards: Hazards based on Air, Water, Soil and Radioisotopes.	12	20
2	**UNIT-2** Air based hazards: Sources, Types of Hazards, Air circulation maintenance industry for sterile area and non-sterile area, Preliminary Hazard Analysis (PHA) Fire protection system: Fire prevention, types of fire extinguishers and critical Hazard management system.	12	20
3	**UNIT-3** Chemical based hazards: Sources of chemical hazards, Hazards of Organic synthesis, sulphonating hazard, Organic solvent hazard, Control measures for chemical hazards, Management of combustible gases,Toxic gases and Oxygen displacing gases management, Regulations for chemical hazard, Management of over Exposure to chemicals and TLV concept.	12	20
4	**UNIT-4** Fire and Explosion: Introduction, Industrial processes and hazards potential, mechanical electrical, thermal and process hazards. Safety and hazards regulations. Fire protection system: Fire prevention, types of fire extinguishers and critical Hazard management system mechanical and chemical explosion, multiphase reactions, transport effects and global rates. Preventive and protective management from fires and explosion electricity passivation, ventilation, and sprinkling, proofing, relief systems - relief valves, flares, scrubbers.	12	20
5	**UNIT-5** Hazard and risk management: Self-protective measures against workplace hazards. Critical training for risk management, Process of hazard management, ICH guidelines on risk assessment and Risk management methods and Tools Factory act and rules, fundamentals of accident prevention, elements of safety programme and safety management, Physicochemical measurements of effluents, BOD, COD, Determination of some contaminants, Effluent treatment procedure, Role of emergency services.	12	20
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy				
Level	Remembrance	Understanding	Application	Analyze
Weightage	35	35	20	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understanding environmental problems and other problems associated.
CO2	Understanding of safety standards in pharma industry and hazard management system.
CO3	Understanding methods of hazard assessment,procedure, and methodology for safe industrial atmosphere

Reference Books

1.	**Environmental Science (TextBook)** By Y.K. Singh | New Age International Pvt, Publishers
2.	**Quantitative Risk Assessment in Chemical Process Industries** American Institute of Chemical Industries, Centre for Chemical Process safety
3.	**The Biodiversity of India (TextBook)** By Bharucha Erach | Mapin Publishing Pvt. Ltd., Ahmedabad
4.	**Hazardous Chemicals: Safety Management and Global Regulations,** By T.S.S. Dikshith | CRC press 13