CREDITS FOR MINOR TRACK

IN

INDUSTRIAL SAFETY AND RESOURCE MANAGEMENT

UNITS	TITLE		CREDITS
	ISRM 101: Industrial Safety		03
I	03 LEC. / W		
	MODULE I	HISTRORY AND DEVELOPMENT OF SAFETY MOVEMENT: ➢ Need for safety, ➢ Safety legislation: Acts and rules, Safety standards and codes, ➢ Safety policy: safety organization and responsibilities and authorities of different levels.	
	MODULE II	ACCIDENT SEQUENCE THEORY: ➢ Accident sequence theory, ➢ Causes of accidents, ➢ Accident prevention and control techniques, ➢ Plant safety inspections, ➢ Job safety Analysis and investigation of accidents, First aid.	
	MODULE III	CHECK LIST PROCEDURES: ➢ Checklist procedure, Preliminary hazard analysis. ➢ What if analysis, Failure mode effect analysis, Hazard and operability (HAZOP) studies. ➢ Hazard analysis techniques: Fault tree analysis, Event tree analysis, General outline of DOW index, Risk estimation and management, Major hazard control, On-site and Off-site emergency preparedness.	
	MODLE IV	IDENTIFICATION AND TYPES OF HAZARDS: ➢ Identification of hazard, Safety in material handling: hazards and safe Practices, safety with storage of materials. ➢ Electrical hazards: classification, safe work practices. ➢ Chemical hazards: laboratory safety, bulk handling of chemicals. ➢ Fire and explosion hazards, Fire detection, Prevention, control, and extinguishments, Industrial layout, Industrial waste management.	
	MODULE V	INDUSTRIAL SAFETY: ➢ History of Safety Movement in India and abroad. ➢ The Accident Problem, Nature & size need for safety, legal, humanitarian, economic and social considerations.	
UNIT	**ISRM 102: SAFETY LEGISLATIONS & MANAGEMENT**		CREDITS
II	03 LEC. / W		03
	MODULE I	INDUSTRIAL SAFETY LEGISLATIONS : Factories Act, 1948, Workman's Compensation Act, 1943, Employees State Insurance Act, 1948. Mines Act,Boiler Vessels Act. Child Labour and Women Employee Act. The factories rules, History, Provisions under the factories Act and rules made there under with amendments, Functions of safety management. ILO Convention and Recommendations in the furtherance of safety, health and welfare	
	MODULE II	OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT MANAGEMENT : Bureau of Indian standards on safety and health 14489 - 1998 and 15001 – 2000 OSHA, Process Safety Management (PSM) as per OSHA, PSM principles, OHSAS – 18001, EPA Standards, Performance measurements to determine effectiveness of PSM	

	MODULE III	SAFETY ORGANIZATION: Role of safety committee and its formation, Safety awareness programme: motivation, education and training, Appraisal of plant safety and measurement of safety performance, Total loss control concept, Introduction to productivity, Quality, Reliability, and Safety (PQRS) theory	
	MODLE IV	SAFETY MANAGEMENT: Role of management in Industrial Safety. Safety Management- Principles & Practices	
	MODULE V	Industrial Visits to following industries / Institutes in and around Navi Mumbai Industrial Area ➢ Chemical industry ➢ NMMC Fire Department ➢ Textile Industry ➢ Fertilizer / Pesticide Industry	
UNIT	**ISRM 201: Safety Awareness & Training**		CREDITS
III	03 LEC. / W		03
	MODULE I	TRAINING FOR SAFETY: Assessment of needs. Design & development of training programme. Training methods and strategies. Training of manager, supervisors & workers. evaluation of training programmes.	
	MODULE II	EMPLOYEE PARTICIPATION: Purpose, nature, scope and methods. Safety committee and union participation.	
	MODULE III	TRADE UNIONS: History of trade unions in India. Role of trade unions in safety and health. Collective bargaining and safety.	
	MODLE IV	SAFETY PROMOTION & PUBLICITY: Safety suggestion schemes. Safety competitions, Safety incentive Schemes. Audio Visual Publicity, other promotional methods.	
	MODULE V	HUMAN BEHAVIOUR AND SAFETY: Human factors contributing to accidents. Individual differences. Behaviour as function of self and situation. Perception of danger and acceptance of risks. Knowledge and responsibility vis-a-vis safety performance. Role of management, Supervisors and safety department in motivation.	
UNIT	**ISRM 202: Industrial Hygiene, Occupational Health & Disaster Management**		CREDITS
IV		03 LEC. / W	03
	MODULE I	ENVIRONMENTAL STRESSES : Physical, chemical, biological and ergonomic stresses, Principles of industrial hygiene, Overview of control measures. Permissible limits. Stress, Exposures to heat, Heat balance, Effects of heat stress, WBGT index measurement, Control Measures.	
	MODULE II	CHEMICAL EXPOSURE : Chemical agents, IS/UN classification, Flammables, Explosives, Water sensitive chemicals, Oxidants, Gases under pressure, Chemicals causing health hazards: irritants, asphyxiates, anaesthetics, systemic poisons and carcinogens, Chronic and acute exposure, Routes of entry, Types of airborne contaminants, Introduction to air sampling and evaluation methods, Occupational exposure limits, Engineering control measures, Principles of ventilation.	
	MODULE III	OCCUPATIONAL HEALTH: Concept of health and occupational health, Spectrum of health, Occupational and work related diseases, Levels of prevention, History of occupational health, Characteristics of occupational diseases, Essentials of occupational health service, personal protective equipment's (respiratory and non-respiratory)	

	MODLE IV	OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT MANAGEMENT: Bureau of Indian standards on safety and health 14489 - 1998 and 15001 – 2000 OSHA, Process Safety Management (PSM) as per OSHA, PSM principles, OHSAS – 18001, EPA Standards, Performance measurements to determine effectiveness of PSM
	MODULE V	Seminars on the following topics ➢ Need for Safety ➢ Safety Policy ➢ HAZOP ➢ Hazard Analysis ➢ Chemical Hazards ➢ Safety in Chemical/fertilizer / textile / food industry
UNIT	**ISRM 301: Control of Workplace Hazards**	CREDITS
V	03 LEC. / W	03
	MODULE I	CONTROL OF PHYSICAL HAZARDS: Purpose of ventilation. Classification of Ventilation as General Ventilation (Natural and Mechanical modes), Local Exhaust Ventilation, Special methods for Thermal Stress control such as Air conditioning, Radiant Heat Control. Engineering Control of noise, Vibration damping, Noise isolation, Noise sorption. Silencers. Case studies on impact of noise from compressors and generators. Vibration: Effects, measurement and control.
	MODULE II	CONTROL OF LIGHTING HAZARDS: Purpose of lighting. Advantages of good illumination. Lighting and safety. Lighting and the work. Sources and types of artificial lighting. Principles of good illumination. Recommended minimum standards of illumination. Design of lighting installation, Lighting and colour,
	MODULE III	CONTROL OF CHEMICAL HAZARDS : Hazardous properties of chemicals and appreciation of information provided in Material safety data sheets. Classification of dangerous materials with pictorial symbols, common hazard and common precautions for each class. Safety in bulk storage of hazardous substances. Safety in shelf storage of hazardous substances. Safety in handling of chemicals in the plant by pipelines. Hazards of chemical reactions, and possibilities of reactions going out of control. Common hazards of important chemical reactions and their control.
	MODLE IV	CONTROL OF MECHANICAL HAZARDS : Common hazards of important unit operations and their control. Safety considerations in process control instrumentation. Safe start up, shut down and emergency shut down procedures. Safety in sampling and gauging. Safety aspects of plant modifications. Proper identification of plants and equipment's. Maintenance of component failure history Corrosion prevention for safety. Preventive maintenance of vulnerable equipment's. Safe entry into confined spaces.
	MODULE V	CONTROL OF ELECTRICAL HAZARDS : Dangers from electricity. Safe limits of amperages, Voltages Safe distance from lines. Capacity and protection of conductors, Joints and connections, Means of cutting of power overload and short circuit protection. Earth fault protection. Earth insulation and continuity tests. Protection against overvoltage. Hazards arising out of 'borrowed' neutrals. Other precautions. Portable electrical apparatus. flame proof electrical apparatus. flame proof electrical equipment's, Precautions in their selection, installation, maintenance and use. Control of hazards due to static electricity.

UNIT	**ISRM 302 : RESEARCH PROJECT**	CREDITS
VI	03 LEC. / W	03
	Topics for Project :	
1.	1. Safety audit	
2.	HAZOP study	
3.	Preparation of emergency plan.	
4.	Design of management information system	
5.	In-plant safety inspection	
6.	Preparation of safety report	
7.	Safety organization and management	
8.	Study of employee's participation in safety.	
9.	Safe guarding of machinery	
10.	Material handling study.	
11.	Design of work place study	
12.	House keeping study	
13.	Lighting study	
14.	Ventilation study	
15.	Fire hazard study	
16.	Electrical hazards study.	
17.	Noise control study.	
18.	Job safety analysis study.	
19.	Fault tree analysis study.	
20.	Hazards identification study.	
21.	Accident investigation and reporting study.	
22.	Measuring safety performance.	
23.	Study of cases under Factories Act	
24.	Any other topic as per the syllabus of theory courses and approval of the faculty	
25.		