SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES

B (2.88) NAAC RE-ACCREDITED

NORTH MAHARASHTRA UNIVERSITY, JALGAON

SYLLABUS

For

CERTIFICATE COURSE IN
INDUSTRIAL SAFETY AND MANAGEMENT

w.e.f.

JUNE, 2013
# CREDITS FOR CERTIFICATE COURSE IN

**‘INDUSTRIAL SAFETY AND MANAGEMENT’**

<table>
<thead>
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<th>UNIT</th>
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<td>ISM 101: Industrial Safety, Hygiene &amp; Occupational Health</td>
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<td>I</td>
<td>Introduction to Industrial Safety</td>
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<td><strong>ISM 102: Control of Workplace Hazards</strong></td>
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ISM 101: INDUSTRIAL SAFETY, HYGIENE & OCCUPATIONAL HEALTH

Unit I: Introduction to Industrial Safety (15 Lectures)
History 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.
Accident sequence theory, Causes of accidents, Accident prevention and control techniques, Plant safety inspections, Job safety Analysis and investigation of accidents, First aid.

Unit II: Risk Assessment & Hazard Identification (15 Lectures)
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.
Identification of hazard, Categorization methods for elimination of hazard, Mechanical hazards; machine guarding, safety with hand tools/ portable power tools, Pressure vessel hazards and their control, 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.

Unit III: Industrial Hygiene (15 Lectures)

Unit VI: Occupational Health (15 Lectures)
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 equipments (respiratory and non-respiratory)
ISM 102: CONTROL OF WORKPLACE HAZARDS

Unit I: Control of Physical Hazards: (15 Lectures)

Unit II: Control of Chemical Hazards (15 Lectures)

Unit III: Control of Electrical Hazards: (15 Lectures)

Unit IV: Control of Fire Hazards: (15 Lectures)
ISM 103: SAFETY LEGISLATIONS & MANAGEMENT

Unit I: Industrial Safety Legislations: (15 Lectures)

ILO Convention and Recommendations in the furtherance of safety, health and welfare.


Unit II: Industrial Safety Management (15 Lectures)
Management: Concept, definition, nature and importance, Role and functions of a manager, Elements and functions of Management.
Industrial Safety: History of Safety Movement in India and abroad. The Accident Problem, Nature & size need for safety, legal, humanitarian, economic and social considerations.
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.

Unit III: Safety Awareness & Training: (15 Lectures)
Employee Participation: Purpose, nature, scope and methods. Safety committee and union participation.
Unit IV: Plant design & housekeeping: (15 Lectures)

ISM 104: PRACTICAL COURSE

Experiments:

1. Measurement of illumination level by Photo Meter.
2. Measurement of Sound Levels.
3. Determination of concentration of inflammable vapours.
4. Measurement of Static Charge/Electricity with the help of Static Charge Meter.
5. Determination of Fire Load in a given work place.
11. Detection of Carbon Monoxide, NOx Hydrogen Sulphide, Ammonia, Aromatic Hydrocarbons, SO₂ by Gas Detectors and other direct reading instruments.
13. Sampling and analysis of Ammonia.
17. Sampling and analysis of SO₂ using Colorimetric method.
19. Plotting of an Audiogram by Audiometer.
21. Assessment of fire & explosion potential and their prevention.
22. Any other experiment as per the syllabus of theory courses and approval of the faculty.
ISM 105: RESEARCH PROJECT

Topics for Project:

1. Safety audit
2. HAZOP study
3. Preparation of emergency plan.
4. Design of management information system
6. In-plant safety inspection
7. Preparation of safety report
9. Safety organization and management
10. Study of employee’s participation in safety.
11. Safe guarding of machinery
12. Material handling study.
13. Design of work place study
14. House keeping study
15. Lighting study
17. Fire hazard study
18. Electrical hazards study.
21. Fault tree analysis study.
22. Hazards identification study.
23. Accident investigation and reporting study.
25. Study of cases under Factories Act.
26. Any other topic as per the syllabus of theory courses and approval of the faculty

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REFERENCE BOOKS

5. The Factories Act with amendments 1987, Govt. of India Publications DGFASLI, Mumbai
12. Safety A personal Focus David L Bever
13. Fire Equipment David L. Bever
14. Industrial Safety National Safety Council of India
15. Engineering Chemistry, Jain & Jain
16. Industrial Management Jain & Bawa
18. Remediation and Treatment Technologies, Dennis P Nolan P.E
19. Fire Technology, R.S. Gupta
20. Major hazard control, Inter National Labor Office
22. Safety, health and working condition in the transfer of technology, Inter National Labor Office
23. Radiation protection, Inter National Labor Office
24. Fire service Manual (4 volumes)
25. Publications from Inter National standard organizations like ISO, OSHA, IOSH, NEBOSH etc.

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