

1.	Name of Course	C. C. IN EXECUTIVE SAFETY MANAGEMENT (W.E.F. 2015-16)																																																
2.	Course Code	411183																																																
3.	Max.No.of Students Per Batch	25 Student																																																
4.	Duration	06 Month																																																
5.	Type	Full Time																																																
6.	No.Of Days / Week	6 days																																																
7.	No.Of Hours /Days	7 Hours																																																
8.	Space Required	1) Workshop - 200 Sq. ft. 2) Classroom - 400 Sq.Ft. Total - 600 Sq.Ft. 3) MOU with Industry.																																																
9.	Minimum Entry Qualification	Degree in any branch of Engg. Or Technology / Diploma in any branch of engg. Or Technology / Degree in Science with Physics & Chemistry with 2 Year Experience in Industry.																																																
10.	Objective Of Course	To create skill manpower in Industrial Safeties.																																																
11.	Employment Opportunity	<b>Employment opportunity :-</b> 1) Safety Officer in any Industry. 2) Safety Auditor 3) Safety Manager 4) Advisor / Consultant & Safety Analysis 5) SHE Department <b>Self Employment :-</b> 1) Consultant 2) Advisor 3) Auditor																																																
12.	Teacher's Qualification	Degree in Any branch of Engineering with Diploma in Industrial Safety. And 2 Years Experience as a Safety Officer in reputed industries.																																																
13.	Training System	<b>Training System per Week</b> <table><tr><td colspan="2">Theory</td><td colspan="2">Practical</td><td colspan="2">Total</td></tr><tr><td colspan="2">12 hrs</td><td colspan="2">30 hrs</td><td colspan="2">42 hrs</td></tr></table>							Theory		Practical		Total		12 hrs		30 hrs		42 hrs																															
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14.	Exam. System	<table><tr><td>Sr. No</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Min. Marks</td></tr><tr><td>1</td><td>41118311</td><td>Safety Management</td><td>TH-I</td><td>3 Hrs.</td><td>100</td><td>35</td></tr><tr><td>2</td><td>41118312</td><td>Safety Engineering</td><td>TH-II</td><td>3 Hrs.</td><td>100</td><td>35</td></tr><tr><td>3</td><td>41118321</td><td>Safety Management</td><td>PR-I</td><td>3 Hrs</td><td>100</td><td>50</td></tr><tr><td>4</td><td>41118322</td><td>Safety Engineering</td><td>PR-I</td><td>3 Hrs</td><td>100</td><td>50</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>400</td><td>170</td></tr></table>							Sr. No	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	41118311	Safety Management	TH-I	3 Hrs.	100	35	2	41118312	Safety Engineering	TH-II	3 Hrs.	100	35	3	41118321	Safety Management	PR-I	3 Hrs	100	50	4	41118322	Safety Engineering	PR-I	3 Hrs	100	50			Total			400	170
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## Theory – I - Safety Management

Unit	Contents
1	Role of function of a manager. Element and function of management. Management role, authority, responsibility & power. Delegation and decentralisation of authority. History of safety management in India and abroad. Planning & Organisation for safety - Definition, need, nature, principle, policy formulation and effect planning for safety. Organisation structure of safety department. Safety committee structure & functions.
2	Directing for safety - Role and function of a leader. Communication with management and employees. Training of worker, training need identification and review of training program. Safety performance in the organisation, safety perception survey and defining safety competencies in organisation.
3	Safety suggestion scheme, safety competitions, safety incentives scheme. Appreciation safety culture importance, direct and indirect cost of accident. Analysis of information on accident. Qualitative and quantitative risk
4	Role of safety project manager, Life cycle's. Standards. Methodologies, Managing safety through project cycle, Project Initiation, PMS Process Flow. The Management components: Organise, Plan, Control, The project management safety organisation model, The safety project team, Organisational causes of safety failure in project issues, Performance reporting – monitoring and control, Safety project plan
5	Risk Management Plan - Identifying risks and triggers, Risk response plan, Communication Management Plan - Identifying key stakeholders, Defining information needs and mechanisms Managing project
6	Principles of Accidents Prevention : Definition: Incident, accident, injury, dangerous, occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes etc. Accident Prevention: Theories/Models of accident occurrences .Principles of accident Prevention. Accident and Financial implication.
7	Introduction to strategy - What is Strategy, Strategic Management, The five competitive forces that shape strategy, Core Competence, Organisational Structure, Process, Culture, Designing Business Level Strategies, Designing Corporate Level Strategies, Global Strategies - Internationalisation: Motivations & Patterns, Building Transnational Corporations, Strategy Implementation & Strategic Change, Leadership & safety Governance, Integrative case study: identifying strengths and weaknesses, Developing strategic options and allocating resources, Evaluation and performance management.
8	Employee Participation in Safety : Employee Participation :Purpose, areas of participation, methods. Role of trade union in Safety Health and Environment Protection. Safety Promotion and Safety Awards and Suggestion Schemes, Safety Competitions Safety Incentives Publicity Schemes, Audio Visual Publicity, other Promotional Methods.
9	Global warming and mitigation measures. Human behavior :Individual differences, behavior as function of self and situation, perception of danger and acceptance of risk, knowledge, and responsibility vis-a-vis safety performance, theories of motivation and their application to safety, role of, supervisors and safety departments in motivation. Conflict & Frustration :Identification of situations leading to conflict and frustration and techniques of management.
10	Management information System : Sources of information on Safety, Health and Environment Protection. Compilation and collation of information, Analysis & use of modern methods of programming, storing and retrieval of MIS for Safety, Health and Environment QCC HS Computer Software Application and Limitations. Status and future goals of computer utilization in Safety, Health and Environment (SHE) Services in Industries.

## Practical – I - Safety Management

1	Study of organization structure of safety department of chemical / Engineering / Textile / IT / Agro Industry / DOCKS / Transportation / Construction / Aviation Industry.
2	Seminar on Policy formulation of Safety in any Industry.
3	Seminar on Risk Management Plan for Safety.
4	Case studies of Strategic Planning.
5	Study of MIS System for Safety, Health and Environment.
6	Failure Mode Analysis.
7	Software usages for :- 1. Accident Analysis 2. Safety Audit Packages. 3. Consequence Analysis (CISCON) 4. Five, Explosion and Toxicity Index (FETI) 5. Reliability Analysis for Mechanical System and Electrical System.

## Theory – II - Safety Engineering

Unit	Contents
1	<b>Machine Operation and Guarding :</b> Principles in machine guarding. Ergonomics of machine guarding. Type of guards, their design and selection. Guarding of different types of machinery including special precautions for wood working, paper, rubber and printing machinery, machine, tools etc. Built-in-safety devices, maintenance and repairs of guards, incidental safety devices and tools.
2	<b>Safety in the use of Machines :</b> shaping, 2.2 Need for selection and care of cutting tools. Preventive maintenance, periodic checks for safe operation. Associated hazards and their prevention. Safety in the use of 1) power presses (all types), 2) shearing, 3) bending, 4) rolling, 5) drawing, 6) turning, 7) boring, 8) milling, 9) planning broaching, planting, 10) grinding, 11) CNCs.
3	<b>Material Handling and Storage of Materials :</b> <b>Manual :</b> Kinetics of manual handling. Maximum loads that could be carried. Lifting and carrying of objects of different shapes, size and weight. Safe use of accessories for manual handling Storage of materials. Safety in stacking and unstacking, floor loading conditions. Layout condition for safety in storage, ergonomics of manual handling and storage. <b>Mechanical :</b> Lifting machinery, lifts and hoists; safety aspects in design and construction, testing, use and care, signaling, inspection and maintenance. Safety in design and construction, operation, inspection and maintenance of industrial trucks, lifting tackles and loose gears, conveyors. Safety features, safe locations, testing, inspection and maintenance of lifting tackles, safe working load for all mechanical material handling equipment. The competent persons in relation to safety legislation - duties and responsibilities.
4	<b>Working at Different Levels :</b> <b>Working at Heights :</b> Incidence of accidents. Safety features associated with design, construction and use of stairways, ramps, working platforms, gangway, ladders of different types, scaffolds of different types including Boatswain's chair and safety harness working on roofs. Other safety requirements while working at heights. <b>Working in Confined Spaces :</b> <b>Working Underground :</b>
5	<b>CONCEPTS AND STATUTORY REQUIREMENTS</b> Introduction – electrostatics, electro magnetism, stored energy, energy radiation and electromagnetic interference – Working principles of electrical equipment-Indian electricity act and rules-statutory requirements from electrical inspectorate-international standards on electrical safety – first aid-cardio pulmonary resuscitation(CPR)
6	<b>PROTECTION SYSTEMS</b> Fuse, circuit breakers and overload relays – protection against over voltage and under voltage – safe limits of amperage – voltage –safe distance from lines-capacity and protection of conductor-joints-and connections, overload and short circuit protection-no load protection-earth fault protection. FRLS insulation-insulation and continuity test-system grounding-equipment grounding-earthleakage circuit breaker (ELCB)-cable wires-maintenance of ground-ground fault circuit interrupter-use of low voltage-electrical guards-Personal protective equipment – safety in handling hand held electrical appliances tools and medical equipments. leakage circuit breaker (ELCB)-cable wires-maintenance of ground-ground fault circuit interrupter-use of low voltage-electrical guards-Personal protective equipment – safety in handling hand held electrical appliances tools and medical equipments.
7	<b>SELECTION, INSTALLATION, OPERATION AND MAINTENANCE</b> Role of environment in selection-safety aspects in application - protection and interlock-self diagnostic features and fail safe concepts-lock out and work permit system-discharge rod and earthing devices- safety in the use of portable tools-cabling and cable joints-preventivemaintenance.

<b>8</b>	<b>Electrical Hazard</b> Hazards of electrical energy. Safe limits of amperages, voltages. Safe distance from lines. Capacity and protection of conductor. Joints and connections. Means of cutting off power. Overload and short circuit protection. No load protection. Earth fault protection. Earth insulation and continuity tests. Earthing Standards. Protection against surge and voltage fluctuation. Hazards arising out of 'borrowed' neutrals. Others precautions. Types of protection for electrical equipment in hazardous atmosphere. Electrical area classification. Criteria in their selection, installation, maintenance and use.
<b>9</b>	<b>Lightning Arrestors :</b> Definition, lightning splash, lightning strokes, lightning protection systems. Characterisation Of health effects of lightning stroke (electrical effects, side flashes, thermal effects, mechanical effects. Function of lightning. Where lightning protection is required – System design, material of construction, component of a lightning arrestors, earth terminal / network.
<b>10</b>	<b>FACTORIES ACT – 1948</b>  Statutory authorities – inspecting staff, health, safety, provisions relating to hazardous processes, welfare, working hours, employment of young persons – special provisions – penalties and procedures-Tamilnadu Factories Rules 1950 under Safety and health chapters of Factories Act 1948
<b>11</b>	<b>ENVIRONMENT ACT – 1986</b>  General powers of the central government, prevention, control and abatement of environmental pollution-Biomedical waste (Management and handling Rules, 1989-The noise pollution (Regulation and control) Rules, 2000-The Batteries (Management and Handling Rules) 2001- No Objection certificate from statutory authorities like pollution control board. Air Act 1981 and Water Act 1974: Central and state boards for the prevention and control of air pollution-powers and functions of boards – prevention and control of air pollution and water pollution – fund – accounts and audit, penalties and procedures.
<b>12</b>	<b>MANUFACTURE, STORAGE AND IMPORT OF HAZARDOUS CHEMICAL RULES 1989</b>  Definitions – duties of authorities – responsibilities of occupier – notification of major accidents – information to be furnished – preparation of offsite and onsite plans – list of hazardous and toxic chemicals – safety reports – safety data sheets.
<b>13</b>	<b>INTERNATIONAL ACTS AND STANDARDS</b>  Occupational Safety and Health act of USA (The Williams-Steiger Act of 1970) – Health and safety work act (HASAWA 1974, UK) – OSHAS 18000 – ISO 14000 – American National Standards Institute (ANSI).

## Practical – II - Safety Engineering

Unit	Contents
1	Visit to machine shop and study machine guarding system, M/C Tool preventive, breakdown maintenance.
2	Visit to material handling plant and study the various components of system.
3	Visit to construction site of multistoried building and study the safety requirement.
4	Project and seminar on Electrical protection system.
5	Illumination Testing by lux meter and photometer.
6	Insulation resistance for motor and cables; Estimation of earth resistance; Earth continuity test; test for ELCB.
7	Visit to Chemical Industry
8	Visit to Transport System

## Tool & Equipments

Sr. No.	Name of Items	Required Quantity
1	Computer Systems	4 Nos.
2	Software as required	
3	Video Projector	1 No.
4	<b>Personal Protective Equipments :-</b> <ol style="list-style-type: none"> <li>a. Respiratory and non-respiratory –demonstration – self contained breathing apparatus.</li> <li>b. Safety Helmet</li> <li>c. Belt.</li> <li>d. Hand Gloves / Goggles / Safety Shoe, Gumboots.</li> <li>e. Ankle Shoes / Face Shield / Nose Mask.</li> <li>f. Ear Plug, Ear muff.</li> <li>g. Anti and Plastics / Rubber materials.</li> <li>h. Apron and Leg Guards.</li> </ol>	AS per requirement according to batches size
5	Software usages for :- <ol style="list-style-type: none"> <li>1. Accident Analysis</li> <li>2. Safety Audit Packages.</li> <li>3. Consequence Analysis (CISCON)</li> <li>4. Five, Explosion and Toxicity Index (FETI)</li> <li>5. Reliability Analysis for Mechanical System and Electrical System.</li> </ol>	
6	Fire Extinguishers	
7	Road Safety Signals and symbols.	
8	First-Aid Box	

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