RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

FT-7001 Fire Fighting Installation

COURSE OBJECTIVE:

1. To describe and design the water based hydrant system in different types of occupancies.
2. To explain the relevant code of practice and design the automatic sprinkler system for a given occupancy.
3. To learn about the foam based fire fighting systems at different applicable fire desirous sites.
4. To solve the problem of fire loss due to water and foam by applying clean extinguishing agent at precious locations.
5. To learn about the special dry chemical and their systems applicable to highly reactive metals.

COURSE CONTENT:

WATER BASED FIRE PROTECTION: Fire water demand calculation, water storage tank capacity, water storage tank equipment and accessories, relationship of air pressure and volume in tanks, calculating fire flow rates by Insurance service office method (ISO), Iowa state university method (ISU), fire flow duration, factors affecting water requirement. Hydrant System- Definition and basic components, Pressure and discharge requirement, spacing between hydrant post, pipe material and size.

AUTOMATIC SPRINKLER SYSTEM: Fundamental of performance- Fire suppression Analogy, Design Consideration, Response time Index, Thermal sensitivity and temperature rating. Sprinkler System layout- Sprinkler system zoning, tree system, looped system, gridded system, placement of mains and branch lines, Sprinkler system spacing, maximum area permitted for protection, spacing between branch lines and sprinklers. Hydraulic calculation and back flow protection. Sprinkler system type- wet pipe system, dry pipe system, pre-action system and deluge system.

FOAM BASED FIRE PROTECTION: System types –Fixed, Semi fixed and mobile foam systems. Fixed cone roof, external floating roof and internal floating roof protection with foam- water sprinkler system. Diked and non diked area protection. Medium and high expansion foam systems, mobile foam apparatus and their application, Foam Fire Fighting at fixed sites- Size of fire, type of fuel, depth of fuel and application rate. Storage tank fire tactics for cone roof, floating roof and horizontal tanks.

GAS BASED FIRE PROTECTION: Halogenated Agents and System- Chemical mechanism, chemical composition, Classification and Properties, Toxic and irritant effect, application systems, flooding system, design consideration- NFPA-12A and NFPA-12B, Halon Replacement agents and systems- Extinguishing Mechanism, Halocarbon agents and Inert Gas agents Ozone depletion, Clean agent system design, Agent quantity and discharge time. Carbon Dioxide Application System- Concentration for extinguishment, life safety consideration NFPA-12, methods of application total flooding, local application, hand hose lines, stand pipe systems and mobile supply, components of carbon dioxide system- Carbon dioxide storage, piping system, valves and operating devices, discharge nozzles, system controls, control panels, alarms. Quantity and venting requirements for different system, use and limitation of systems.

DRY CHEMCIAL BASED FIRE PROTECTION SYSTEM: Method of application, system design NFPA-17, storage of chemical and expellant, system actuation and distribution system. Quantity and application rate of dry chemical. Inspection, testing and maintenance procedures for chemical systems. Listed agents for metal fires MET-L-X powder, Na-X powder, other combustible metal extinguishing agent, non proprietary combustible metal extinguishing agents.

COURSE OUTCOME:

1. Students will be able to describe and design water based fire protection system for a given occupancy.
2. Students will be able to design and estimates the sprinkler system for a given occupancy.
3. Students will be able to explain and evaluate the foam based fire protection systems for class-B liquid fires.
4. Students will be able to justify the use of gaseous based fire protection inside the precious locations.
5. Students will be able to plan chemical powder based fire fighting systems and able to estimate the cost of the system.

LABORATORY:

1. To draw the suction and delivery arrangement of main, standby and jockey pump for a given sample of pump house and calculate the fire water demand.
2. To summarize the Sprinkler system components and draw the sprinkler installation for a given sample of an occupancy.
3. To recognize the major components of hydrant system and draw the hydrant system installation for a given sample of an occupancy.
4. To plan the foam based fire protection system and design for medium and high expansion foam system inside a given sample of flammable liquid tank.'
5. To analyze and evaluate the inert gas fire protection system drawing for a given sample of an occupancy.
6. To draw the major components of dry chemical based fire protection system in a given sample of hazardous location.
7. To draw and analyze the components of water spray system in a given sample of LPG bullet storage facility.
8. To draw and describe the components water mist/emulsify system for a given sample of transformer model.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

Fred Stowell, Principles of Foam Fire Fighting International Fire Service Training Association.
Robert M Gagnon, Designer's Guide to Automatic Sprinkler Systems, NFPA-2005.
Operation of Fire Protection System NFPA Special Edition.
Tariff Advisory committee, Fire Protection Manual- Hydrant System.
Tariff Advisory committee, Manual for Water Spray System.
Fire Service Manual, Fire Service Technology Equipment and media Fire Fighting Foam Technical Volume-1.
Arthur E. Cote, P.E., Fire Protection Handbook, Section-10 and 11, National Fire Protection Association.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

FT-7002 Safety Engineering & Its Industrial Application

COURSE OBJECTIVE:
To understand the fundamental of safety engineering in material handling, operation at different levels with major industrial hazards and their application in emergency planning of an organization..

COURSE CONTENT:

MATERIAL HANDLING AND MECHANICAL HAZARDS: Principles of Material handling, Material characteristics, Major equipments categories- Positioning equipment, Conveyors and Automatic Guided vehicles, Mechanical injuries- Safe guards and their requirement, Point of operation for guards and devices. Sensing devices for guards- mechanical limit switches and non mechanical actuation, Guard locking systems and devices, Sensor for motion detection, Presence sensing devices- Trip devices, Mechanical trip switches, Trip wires, Pressure sensing mats, Edge detections, Opto electronic presence detector, Light curtains, Control devices for safety.

HAZARDS AND CONTROL AT DIFFERENT LEVEL: Causes and kind of falls, Walking and slipping, Impact and acceleration hazards, Lifting and standing hazards, Forklift safety. Lockout- tagout, log-in procedure, Loto hardware, Energy isolation release from lockout or tagout, Special procedure. Confined space entry- Identification and hazards, Confined space entry procedure and permits, Duties and responsibilities of entrants, Attendants and rescue team, Hot work procedure and permits. Behavior based Safety.

PRESSURE HAZARDS AND VESSEL TESTING: Pressure hazard sources, Boilers and pressure hazard, High temperature water hazard, Hazard of unfired pressure vessels, Measurement and reduction of pressure hazards. Pressure vessels definition, Classification and grading, Examination intervals and principles, Defect and failure, Pressure testing, Types of pressure test, Safety precaution in pressure and hydraulic testing, Leak testing and detection, Leak location methods and leak rate.

EMERGNECY PLANNING: Safety in industries involving hazardous processes- types of hazards in chemical industries, Introduction, Onsite Emergency planning, Developing Emergency plan, Essential function and Nominated personnel, Off-site Emergency planning, Emergency Incidents and emergency Scenarios – case studies.

INDUSTRIAL HAZARDS AND CONTROL : Hazards and their control in the manufacture of articles from refractory materials, hazards in solvent extraction plants and their control, safety in industries, manufacturing rayon by viscose process, hazards and their control in fertilizer industries, hazards and their control in LPG bottling plant.

COURSE OUTCOME:
1. Students will be able to recognize major material handling equipment and design safe guards for mechanical hazards prevention.
2. Students will be able to illustrate hazards during operation at different levels and develop safe operating procedures.
3. Students will be able to visualize the pressure hazards and plan vessel testing for the organization.
4. Students will be able to demonstrate emergency planning of an organization in onsite and offsite situations.
5. Students will be able to identify the major industrial hazards and their control measures.

LABORATORY:

1. To visualize and demonstrate the function of mechanical limit switches in EOT crane with the help of sample working model.
2. To plan the requirement and design the safe guards for a sample working model of bucket elevator.
3. To define and demonstrate trip wire function for emergency lock inside the sample working model of conveyor belt.
4. To schematize the safe operating procedure for confined space entry and demonstrate confined space entry operation within the sample model of confined space entry.
5. To perform the pressure vessel test for a given sample of pressure vessel with the help of ultra sonic thickness tester and hand/electric operated hydraulic pump.
6. To recognize and relate the rated load capacity of a sample working model of EOT cranes and interpret it with safe load capacity.
7. To schematize the safe operating procedure for prevention of chlorine leakage and demonstrate the chlorine leakage and its control with the help of emergency kit and neutralization process.
8. To measure the efficiency of exhaust fan for removal of toxic fumes through exhaust duct in a given sample of "acid spread" model.

EVALUATION:

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

Sam Mannan, Lees' Loss Prevention in the Process Industries, Third Edition Volume-2 section-19
Sam Mannan, Lees' Loss Prevention in the Process Industries, Third Edition Volume-2 section-24
Paul A. Erickson, Practical Guide to Occupational Health and Safety, Academic Press
David L. Goetsch. Occupational Safety and Health for Technologist, Engineers and Manager- Third edition, Prentice- Hall Inc.
Dave Macdonald, Practical Machinery safety, Newnes
Dr. K.U. Mistry, Fundamentals of Industrial safety & health, Siddhart Prakashan.

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RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

FT-7003 Heat Transfer

COURSE OBJECTIVE:

To understand the fundamentals of heat transfer mechanisms in fluids and solids and their applications in various heat transfer equipment in process industries.

COURSE CONTENT:

CONDUCTION: Modes of heat transfer one dimensional and two dimensional, heat rate equations, Theory of insulation, critical radius calculations, types of insulation material, conduction through slab, cylinder and sphere.

CONVECTIVE HEAT TRANSFER: Heat transfer in boundary layer and in films, natural and forced convection, co/counter/cross current contacting for heat transfer, individual and overall heat transfer coefficient, fouling factor.

RADIOACTIVE HEAT TRANSFER: Black body radiation, concept of shape factor, methods of determination of shape factor, radiation exchange in enclosure with black surfaces.

HEAT TRANSFER UNDER PHASE CHANGE CONDITIONS: Boiling and condensation of pure components, heat flux temperature diagram for boiling and condensation under vertical and horizontal surfaces, nucleate & pool boiling, effect of surface condition on condensation, correlation for heat transfer under condensation. Evaporation- Type of evaporators and their applications single and multiple effect evaporators, design and operation of forward– backward and mixed feed operations, effect of boiling point elevation and hydrostatic head vapour recompression.

HEAT EXCHANGE EQUIPMENT: Introduction to general design of double pipe, shell and tube exchangers, condensers, extended surface equipments, heat exchanger equation – coil to fluid, jacket to fluid.

COURSE OUTCOME:

1. Students will be able to understand modes of heat transfer, heat rate equation, theory of insulation
2. Students will be able to solve convective heat transfer problems, individual and overall heat transfer coefficient, fouling factor.
3. Students will be able to solve radiative heat transfer problems.
4. Students will be able to understand heat transfer under phase change conditions, boiling & condensation and to design forward and backward evaporators
5. Students will be able to design of double pipe shell and tube exchanger, condensers, extended surface equipment.

LABORATORY:

1. To determine the thermal conductivity of metal rod.
2. To determine the equivalent thermal conductivity of composite wall.
3. To determine heat transfer coefficient in force convection.
4. To determine heat transfer coefficient in Natural convection.
5. To determine heat transfer coefficient with the help of Stefan Boltzmann Apparatus.
6. To calculate emissivity of the test plate by emissivity measurement apparatus.
7. To determine heat transfer coefficient in double pipe heat exchanger.
8. To study the heat transfer characteristics of a shell and tube heat exchanger (heating/cooling) of water.
9. To determine heat transfer coefficient in parallel and counter flow heat exchanger.
10. To measure the rate of evaporation using an open pan evaporator.
11. To measure the rate of condensation of pure water vapour and to determine the heat transfer coefficient.

12. Demonstrate the film-wise drop-wise condensation and determination of the heat transfer coefficient.
13. To study the single effect evaporator and find out the heat transfer coefficient.

EVALUATION:
Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES:
Donald Q. Kern; Process Heat Transfer; Tata McGraw Hill.
Alan J. Chapman; Heat Transfer; Collier McMillan.
Rao Y.V.C; Heat Transfer; PHI

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

Elective-III FT-7004 (1) Structure's Behavior Under Fire

COURSE OBJECTIVE:

To learn and understand the burning building collapse due to failure of structures at elevated temperature during fire.

COURSE CONTENT:

CONSTRUCTION TERMS OF BUILDING DESIGN AND TYPES OF LOADS: General collapse information, General causes of collapse and its types, Constructive terms of building design-Arch, Beam and its types, Buttress, Deck, Façade, Fire cut beam, Girder gusset plate, types of wall, Lintel joist, suspended ceiling and braced frame construction. Types of loads and methods of application, Hierarchy of structural framing and zone of danger.

FIRE EFFECTS ON BUILDING: Effect of Fire, Natural ventilation, Smoke movement in buildings, Smoke movement in tall buildings, Stack effect, Wind effects, Influence of openings in tall buildings, Smoke shaft, Smoke control during building design, Control of smoke spread, Mechanical ventilation, Pressurization system and their types, Design of smoke control pressurization system for a building.

ANALYSIS OF STRUCTURAL DAMAGE: Wall collapse- Masonry wall, Concrete wall and wood frame walls. Roof collapse- Sloping peak roof, Timber truss roof, Flat roof and steel roof, Stairway collapse, Floor collapse-Terrazzo floor, wooden I beam, Precast concrete slabs, Column collapse.

POST FIRE ANALYSIS: Post fire analysis and fire protection to buildings Rain roof, Fire Retarding compartmentation, fire fact sheet, the fire diagram and fire photographic documentation, Fire planning and design, Confinement of fire site planning access to fire fighting appliances, Contribution of external walls and roof covering, Aspects of internal planning, reduction of fire spread, Concept of compartments and types, Construction of compartments, Space and circulation, Principles and types of fire and roof venting, Effect of wind on roof vent, Industrial building ventilation.

BUILDING CONSTRUCTION AND HAZARDS: Five standard types of building construction and their collapse hazards. Time temperature grading curves, Head balance for an enclosure during a fire, Fire severity and factors controlling fire severity, Thermal properties of wall fixtures & geometrical properties of a room compartment, Thermal insulation heat transfer and radiation, Calculation of fire resistance of a compartment, fire spread within, outside and between the buildings, Flames outside buildings, Reduction of risk of fires explosions.

COURSE OUTCOME:

1. Students will be able to identify the constructive terms of building design and general causes of collapse.
2. Students will be able to describe effect of fire, smoke movement and smoke control pressurization system for a buildings.
3. Students will be able to analyze structural damage for different load bearing and non load bearing elements..
4. Students will be able to distinguish between post fire analysis and planning/design for reduction of fire spread.
5. Students will be able to explain types of building construction with their collapse hazard.

EVALUATION:

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES:

Vincent Dunn, Collapse of Burning Buildings: A guide to fire ground safety, Penn well corporation.
Howard J. Hill, Failure Point: How to determine Burning building stability, Penn well corporation.
Glenn. P corbeti, Builidng construction for the fire service, Jones & Barl.
T Z Harmathy, Fire Safety Design and Concrete, Longman Group UK Limited.
Bernard J. "Ben" Klaene, Structural Fire Fighting, National Fire Protection Association.
J.A. Purkiss, Fire Safety Engineering Design of Structures, Butterworth Heinemann.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

Elective-III FT-7004 (2) Operations Research and Supply Chain

COURSE OBJECTIVE:

To learn and understand the fundamental of various mathematical model like- linear system and distribution, supply chain management, problem of excess inventory and cycle time, waiting line and decision analysis applications in field of fire safety engineering.

COURSE CONTENT:

LINEAR SYSTEM AND DISTRIBUTION MODELS**:** Mathematical formulation of linear systems by LP, solution of LP for two variables only, special cases of transportation and assignment and its solution, Vogel□s forward looking penalty method, cell evaluation degeneracy, use of SW Lindo, Tora, Excell.

SUPPLY CHAIN MANAGEMENT (SCM): Definition, importance, expenditure and opportunities in SCM; integration of inbound, outbound logistics and manufacturing to SCM, flow of material money and information, difficulties in SCM due to local v/s system wide (global) optimization and uncertainties in demand and transportation; Bull-whip effect; customer value; IT, info-sharing and strategic partnerships; plant and warehouse-network configuration; supply contracts and revenue sharing; outsourcing; transportation, cross docking and distribution, forecasting models in SCM; coordination and leadership issues; change of purchasing role and vendor rating, variability from multiple suppliers.

INVENTORY MODELS: Necessity of inventory in process and safety stock, problem of excess inventory and cycle time (=WIP/ Throughput), JIT/ lean mfg; basic EOQ/ EPQ models for constant review Q-system(S,s); periodic review, base stock P-system; service level, lead time variance and safety stock;; ABC, VED and other analysis based on shelf life, movement, size, MRP technique and calculations, lot sizing in MRP, linking MRP with JIT; evolution of MRP to ERP to SCM and e-business.

WAITING LINE MODELS Introduction, Input process, service mechanism, Queue discipline, single server (M/M/1) average length and times by Little□s formula, optimum service rate; basic multiple server models (M/M/s) Competitive strategy- concept and terminology, assumptions, pure and mixed strategies, zero sum games, saddle point, dominance, graphical, algebraic and LP methods for solving game theory problems.

DECISION ANALYSIS: decision under certainty, risk probability and uncertainty; Hurwicz criteria; AHP-assigning weight and consistency test of AHP. Meta-heuristics - Definition of heuristic and meta-heuristic algorithms; introduction to Tabu search, Simulated Annealing and Genetic algorithms and solution of traveling salesman and non linear optimization problems.

COURSE OUTCOME:

1. Student will able to use of basic methodology for the solution of linear programs and distribution models.
2. Student will able to analyze and discuss in a systematic and critical manner the concepts, principles and models related to supply chain management
3. Student will able to learn inventory control theory and its application in the contemporary production and distribution networks.
4. Student will able to apply the concepts of queuing systems in real life situations and model for analysis.
5. Student will able to design new simple model and improve decision- making & develop critical thinking and objective analysis of decision problem.

EVALUATION:

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCE:

Hillier FS and Liberman GJ; Introduction to Operations Research concept and cases; TMH
Simchi-Levi, Keminsky; Designing and managing the supply chain; TMH.
Srinivasan G; Quantitative Models In Operations and SCM; PHI Learning
Mohanty RP and Deshmukh SG; Supply Chain Management; Wiley India
Taha H; Operations research; PHI
Sen RP; Operations Research-Algorithms and Applications; PHI Learning
Ravindran , Philips and Solberg; Operations research; Wiley India
Vollman, Berry et al; Manufacturing planning and control for SCM; TMH.
Bowersox DJ, Closs DJ, Cooper MB; Supply Chain Logisti Mgt; TMH
Burt DN, Dobler DW, StarlingSL; World Class SCM; TMH
Bronson R ;Theory and problems of OR; Schaum Series; TMH

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

Elective-IV FT-7005 (1) Disaster Management

COURSE OBJECTIVE:
To understand the fundamentals approaches of disaster risk reduction & relationship between vulnerability, disaster, disaster prevention and risk reduction.

COURSE CONTENT:
Types and consequence of major accident hazards, Role of management, Local authorities and public, Disaster Management rehabilitation Cycle - Prevention, Mitigation, Preparedness, Disaster impact, Response, Restoration, Reconstruction, Onsite & offsite emergency planning; Emergency preparedness, rehearsal & exercises.

Role of Insurance in Disaster Management, Role of International co-operation (i.e. NGO & UN Agencies), Effect on environment due to disaster. Need for National Capacity Building and Disaster Knowledge Network

The Disaster Management Act:: Need for technological input in disaster mitigation, community based disaster preparedness program; Preparation of Disaster Management; Plan Early Warning System; Role of Information Technology (IT)

Natural Disaster like Earthquake, Mine fire, flood etc, Dangerous properties of some highly hazardous chemicals, Industrial Disaster due to toxic gas release, Fire or Explosion, Case - Studies.

Accident related Disasters (Forest fires, Air, road, & Rail Accidents, Rural & Urban Fires, Oil Spills, Major building collapse etc, Case Studies.

COURSE OUTCOME:
1. Student will able to evaluate the principles and practices of disaster risk reduction and management.
2. Student will able to know the basic role of public, national/international organizations in disaster management.
3. Student will able to prevention, mitigation preparedness, response and recovery process in disaster management.
4. Students will able to understand distinguish between the different approaches needed to manage pre-during and post disaster periods.
5. Student will able to apply the knowledge in conducting independent DM study including data search and analysis from disaster case study.

EVALUATION:
Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES:
Disaster Management Act 2005
Industrial Security Management S.C. Dey
Dangerous Properties of Industrial Material Irvin Sex.
Encyclopedia of occupational Health & Safety (OSHA) IV edition.
Safe Handling of Hazardous Chemicals by Rohatgi.
Industrial Fire Hazards Hand Book (NFPA)
Major Hazard Control I.L.O. Geneva.
What went wrong-Trevor Kletz.
Chemical process safety Daniel . A. Crawl, Joseph F Louver.
Madhya Pradesh Control of Industrial Major Accident Hazards rules 1999.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

Elective-IV FT-7005 (2) Simulation and Process Modeling

COURSE OBJECTIVE:
To understand and learn to develop mathematical models of phenomena involved in various fire safety engineering processes and solutions for these models.

COURSE CONTENT:
Introduction to modeling and simulation: Modeling and simulation methodology, system modeling, concept of simulation; gaming; static, continuous and discrete event simulation.

Basic concept of probability, generation and characteristics of random variables, continuous and discrete variables and their distributions; mapping uniform random variables to other variable distributions; linear, nonlinear and stochastic models

Introduction to Queuing Theory: Characteristics of queuing system, Poisson's formula, birth-death system, equilibrium of queuing system, analysis of M/M/1 queues. Introduction to multiple server Queue models M/M/c Application of queuing theory in manufacturing and computer system

System Dynamics modeling: Identification of problem situation, preparation of causal loop diagrams and flow diagrams, equation writing, level and rate relationship, Simulation of system dynamics models.

Verification and validation: Design of simulation experiments, validation of experimental models, testing and analysis. Simulation languages comparison and selection, study of simulation software -Arena, Pro-model, SIMULA, DYNAMO, STELLA, POWERSIM.

COURSE OUTCOME:
1. Student will able to describe the role of important elements of discrete event simulation and modeling paradigm.
2. Students will be able to understand the basic of probability and random variable distribution.
3. Student will able to determine service time and waiting time in queue theory and application of queuing theory in manufacturing industries.
4. Student will able to identify the problems situation related to system development decision, originating from source requirement & goal.
5. Student will able to create a model prediction based upon new input & validate the output data.

EVALUATION:
Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES:

Law AM and Kelton WD; Simulation Modeling and Analysis; TMH
Gordon G., System simulation, PHI Learningl
Banks J; Hand book of Simulation; John Wiley.
Taha H, Operations Research; PHI.
Hillier FS, Liberman GJ; Introduction to OR; TMH.
Deo N; System Simulation with Digital Computer; PHI Learning
Harrell C, Ghosh B, Bowden R; Simulation Using Promodel; MG Hill
Seila, Ceric and Tadikmalla; Applied Simulation Modeling, Cengage
Payer T., Introduction to system simulation, McGraw Hill.
Sushil, System Dynamics, Wiley Eastern Ltd.
Spriet JA; Computer Aided Modeling and Simulation, Academic Press INC; USA

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

FT-7006 Project –I (Minor Project)

Provision of Minor project is made as preparation phase-I for major project or to take it as an independent small project.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Fire Technology & Safety Engineering, VII-Semester

FT-7007 Industrial Training (Two weeks)/Fire Fighting Drills

COURSE OBJECTIVE:

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide for their Major Project in final semester.

COURSE CONTENT:

Duration: Minimum 2 weeks in summer break after VI semester, assessment to be done in VII semester

EVALUATION:

For the assessment of industrial training undertaken by the students, following components are considered with their weightage.

(a) Term Work in Industry	**Marks Allotted**
Attendance and General Discipline	05
Daily diary Maintenance	05
Initiative and participative attitude during training	05
Assessment of training by Industrial Supervisor	05
Total	20*

(b) Practical/Oral Examination (Viva-Voce) in Institution	**Marks Allotted**
1. Training Report	15
2. Seminar and cross questioning (defense)	15
Total	30

* - Marks of various components in industry should be awarded by the I/c of training in Industry but in special circumstances if not awarded by the industry then faculty in charge /T.P.O. will give the marks.

During training students will prepare a first draft of training report in consultation with section in charge. After training they will prepare final draft with the help of T.P.O. /Faculty of the Institute. Then they will present a seminar on their training and they will face viva-voce on training in the Institute.