STELLA MARY'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,
Accredited by NAAC & Accredited by NBA – Mech, CSE)
Aruthenganvilai, Kallukatti Junction, Azhikal Post, Kanyakumari District – 629202, TamilNadu.

M.E Industrial Safety Engineering

Students Name List

Sl. No	Reg. No	Name of the Student
1	963522423001	ANJANEYA M G
2	963522423002	JEBIN MOSES R
3	963522423003	JESHWIN ARUL J
4	963522423004	JOEL ANDERSON I
5	963522423005	LIBIN J
6	963522423007	SARASAR ROBERT R M
7	963522423008	SIFRA J

UNIT V SAFETY IN DEMOLITION WORK **9**

Safety in demolition work, manual, mechanical, using explosive - keys to safe demolition, pre survey inspection, method statement, site supervision, safe clearance zone, health hazards from demolition - Indian standard - trusses, girders and beams – first aid – fire hazards and preventing methods – interesting experiences at the construction site against the fire accidents.

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of the course the students will be able

- To identify the problems impeding safety in construction industries.
- To identify types and causes of accidents, and designing aids for safe construction.
- To understand the hazards during construction of power plant, road works and high rise buildings.
- To understand the safety procedure for working at heights during construction.
- To have knowledge in selection, operation, inspection and testing of various construction machinery.
- To list out construction regulations and Indian standards for construction and demolition work.

REFERENCES

1. Handbook of OSHA Construction safety and health charles D. Reese and James V. Edison
2. Hudson, R.,"Construction hazard and Safety Hand book, Butter Worth's, 1985.
3. Jnathea D.Sime, "Safety in the Build Environment", London, 1988.
4. V.J.Davies and K.Thomasin "Construction Safety Hand Book" Thomas Telford Ltd., London, 1990.

CO-PO MAPPING

CO	PO					
	1	**2**	**3**	**4**	**5**	**6**
1	2	-	-	-	-	-
2	-	-	-	3	-	2
3	-	3	-	-	-	-
4	-	-	-	2	2	-
5	-	-	2	-	-	-
AVg.	2/1=2	3/1=3	2/1=2	(3+2)/2=2.5	2/1=2	2/1=2

1- low, 2-medium, 3-high, '-"- no correlation

IS4007 NUCLEAR ENGINEERING AND SAFETY **L T P C**
3 0 0 3

OBJECTIVES:

- To know about nuclear energy and fission fusion process.
- To gain knowledge in reactor types, design considerations and their operational problems.
- To know the current status of India in nuclear energy.

UNIT I INTRODUCTION **9**

Binding energy – fission process – radio activity – alpha, beta and gamma rays radioactive decay – decay schemes – effects of radiation – neutron interaction – cross section – reaction rate – neutron moderation – multiplication – scattering – collision – fast fission – resonance escape – thermal utilization – criticality.

UNIT II REACTOR CONTROL 9

Control requirements in design considerations – means of control – control and shut down rods – their operation and operational problems – control rod worth – control instrumentation and monitoring – online central data processing system.

UNIT III REACTOR TYPES 9

Boiling water reactors – radioactivity of steam system – direct cycle and dual cycle power plants- pressurized water reactors and pressurized heavy water reactors – fast breeder reactors and their role in power generation in the Indian context – conversion and breeding – doubling time – liquid metal coolants – nuclear power plants in India.

UNIT IV SAFETY OF NUCLEAR REACTORS 9

Safety design principles – engineered safety features – site related factors – safety related systems – heat transport systems – reactor control and protection system – fire protection system – quality assurance in plant components – operational safety – safety regulation process – public awareness and emergency preparedness. Accident Case studies- Three Mile island and Chernobyl accident.

UNIT V RADIATION CONTROL 9

Radiation shielding – radiation dose – dose measurements – units of exposure – exposure limits – barriers for control of radioactivity release – control of radiation exposure to plant personnel – health physics surveillance – waste management and disposal practices – environmental releases.

TOTAL: 45 PERIODS

OUTCOMES:

The students will be able to

1. Demonstrate nuclear fission and fusion process and their utilization.
2. Understand types of reactors and their Control requirements.
3. Explain the safety design principles and safety regulation process.

REFERENCES

1. "Loss prevention in the process Industries" Frank P.Lees Butterworth-Hein-UK, 1990.
2. Loffness, R.L., "Nuclear Power Plant" Van Nostrand Publications, 1979.
3. M.M.E.L.Wakil, "Nuclear Energy Conversion", International Text Book Co.
4. M.M.E.L.Wakil, "Nuclear Power Engineering", International Text Book Co.
5. R.L.Murray, "Introduction to Nuclear Engineering", Prentice Hall.
6. Sri Ram K, "Basic Nuclear Engineering" Wiley Eastern Ltd., New Delhi, 1990.
7. Sterman U.S.'"Thermal and Nuclear Power Stations", MIR Publications, Moscow, 1986.

CO-PO MAPPING

CO	PO					
	1	2	3	4	5	6
1	-	-	-	2	-	-
2	-	-	-	-	2	-
3	-	-	-	-	-	3
4	-	-	-	-	-	-
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AVg.	-	-	-	2/1=2	2/1=2	3/1=3

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- Internship should be evaluated through final presentation with viva-voce exam.

TOTAL: 60 PERIODS

OUTCOMES:

The students will be able to

1. Select and analysis the effective industry safety methods for the given field applications.

CO-PO MAPPING

CO	PO					
	1	2	3	4	5	6
1	-	2	3	-	3	2
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
AVg.	-	2/1=2	3/1=3	-	3/1=3	2/1=2

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IL4076 PLANT LAYOUT AND MATERIAL HANDLING L T P C
3 0 0 3

COURSE OBJECTIVES:

- To provide provided with the knowledge of the process of analyzing and developing information to produce a plant layout based on the locations and working conditions.
- To educate the students about the basic things of work conditions which includes ventilation, comfort, lighting and its effect based on various nature of work.
- To provide knowledge on effective and safe layout design of an industry.

UNIT I PLANT LOCATION 9

Selection of plant locations, territorial parameters, considerations of land, water, electricity, location for waste treatment and disposal, further expansions

Safe location of chemical storages, LPG, LNG, CNG, acetylene, ammonia, chlorine, explosives and propellants

UNIT II PLANT LAYOUT 9

Safe layout, equipment layout, safety system, fire hydrant locations, fire service rooms, facilities for safe effluent disposal and treatment tanks, site considerations, approach roads, plant railway lines, security towers.

Safe layout for process industries, engineering industry, construction sites, pharmaceuticals, pesticides, fertilizers, refineries, food processing, nuclear power stations, thermal power stations, metal powders manufacturing, fireworks and match works

UNIT III WORKING CONDITIONS 9

Principles of good ventilation, purpose, physiological and comfort level types, local and exhaust ventilation, hood and duct design, air conditioning, ventilation standards, application.

Purpose of lighting, types, advantages of good illumination, glare and its effect, lighting requirements for various work, standards- Housekeeping, principles of 5S.

UNIT IV MANUAL MATERIAL HANDLING AND LIFTING TACKLES 9

Preventing common injuries, lifting by hand, team lifting and carrying, handling specific shape machines and other heavy objects – accessories for manual handling, hand tools, jacks, hand trucks, dollies and wheel barrows – storage of specific materials - problems with hazardous materials, liquids, solids – storage and handling of cryogenic liquids - shipping and receiving, stock picking, dock boards, machine and tools, steel strapping and sacking, glass and nails, pitch and glue, boxes and cartons and car loading – personal protection – ergonomic considerations.

Fiber rope, types, strength and working load inspection, rope in use, rope in storage - wire rope, construction, design factors, deterioration causes, sheaves and drums, lubrication, overloading, rope fitting, inspection and replacement – slings, types, method of attachment, rated capacities, alloy chain slings, hooks and attachment, inspection

UNIT V MECHANICAL MATERIAL HANDLING 9

Hoisting apparatus, types - cranes, types, design and construction, guards and limit devices, signals, operating rules, maintenance safety rules, inspection and inspection checklist – conveyors, precautions, types, applications.

Powered industrial trucks, requirements, operating principles, operators selection and training and performance test, inspection and maintenance, electric trucks, gasoline operated trucks, LPG trucks – power elevators, types of drives, hoist way and machine room emergency procedure, requirements for the handicapped, types- Escalator, safety devices and brakes, moving walks – man lifts, construction, brakes, inspection.

TOTAL: 45 PERIODS

OUTCOMES:

CO 1: The students will be able to Identify equipment requirements for a specific process and for various locations and working conditions.
CO 2: The students will be able to Design an efficient material handling system.
CO 3: Understand the difficulties during the design and implementation of the plant layout.
CO 4: Know about material handling requirements and methods
CO 5: Understand the inspection and maintenance techniques.

REFERENCES:

1. ”Accident prevention manual for industrial operations” N.S.C., Chicago, 1982.
2. Alexandrov. M.P. ”Material handling equipment” Mir Publishers, Moscow, 1981
3. APPLE M. JAMES “Plant layout and material handling”, 3rd edition, John Wiley and sons.
4. “Encyclopedia of occupational safety and health”, ILO Publication, 1985

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IS4006 SAFETY IN CONSTRUCTION L T P C
3 0 0 3

OBJECTIVES:

- To know causes of accidents related to construction activities and human factors associated with these accident
- To understand the construction regulations and quality assurance in construction
- To have the knowledge in hazards of construction and their prevention methods
- To know the working principles of various construction machinery
- To gain knowledge in health hazards and safety in demolition work

UNIT I ACCIDENTS CAUSES AND MANAGEMENT SYSTEMS 9

Problems impeding safety in construction industry- causes of fatal accidents, types and causes of accidents related to various construction activities, human factors associated with these accident – construction regulations, contractual clauses – Pre contract activates, preconstruction meeting - design aids for safe construction – permits to work – quality assurance in construction - compensation – Recording of accidents and safety measures – Education and training

UNIT II HAZARDS OF CONSTRUCTION AND PREVENTION 9

Excavations, basement and wide excavation, trenches, shafts – scaffolding , types, causes of accidents, scaffold inspection checklist – false work – erection of structural frame work, dismantling – tunneling – blasting, pre blast and post blast inspection – confined spaces – working on contaminated sites – work over water - road works – power plant constructions – construction of high rise buildings.

UNIT III WORKING AT HEIGHTS 9

Fall protection in construction OSHA 3146 – OSHA requirement for working at heights, Safe access and egress – safe use of ladders- Scaffoldings , requirement for safe work platforms, stairways, gangways and ramps – fall prevention and fall protection , safety belts, safety nets, fall arrestors, controlled access zones, safety monitoring systems – working on fragile roofs, work permit systems, height pass – accident case studies.

UNIT IV CONSTRUCTION MACHINERY 9

Selection, operation, inspection and testing of hoisting cranes, mobile cranes, tower cranes, crane inspection checklist - builder's hoist, winches, chain pulley blocks – use of conveyors - concrete mixers, concrete vibrators – safety in earth moving equipment, excavators, dozers, loaders, dumpers, motor grader, concrete pumps, welding machines, use of portable electrical tools, drills, grinding tools, manual handling scaffolding, hoisting cranes – use of conveyors and mobile cranes – manual handling.

UNIT V SAFETY IN DEMOLITION WORK **9**

Safety in demolition work, manual, mechanical, using explosive - keys to safe demolition, pre survey inspection, method statement, site supervision, safe clearance zone, health hazards from demolition - Indian standard - trusses, girders and beams – first aid – fire hazards and preventing methods – interesting experiences at the construction site against the fire accidents.

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