## SAFETY MANAGEMENT IN CONSTRUCTION

Course Category:       HONORS       Credits:       4         Course Type:       Theory       Lecture-Tutorial-Practical:       3-1-0         Prerequisites:       20ES1301-Construction Concrete Technology       Materials       & Continuous       30         Course Outcomes       20ES1301-Construction Concrete Technology       Materials       & Continuous       30         Course Outcomes       20ES1a01-Construction Concrete Technology       Semester End Evaluation:       70         Course Outcomes       Total Marks:       1000         Course Course Outcomes       Semester End Evaluation:       70         Coor Explain the principles of SHE management including hazards and accidents in construction site. It is to be observed during their execution.       K         Cool       Explain the risks in underground construction. Regulations, planning and precautions in civil works in confined spaces       K         Cool       Describe the safety precautions in construction. Regulations, planning and precautions in demolition of structures including electrical safety practices:       K         Cool       Do Poi Poi Poi Poi Poi Poi Poi Poi Poi Po	Offer	ing B	ranch	es	CE											
Course Type:     Theory     Lecture-Tutorial- Practical:     3-1-0       Prerequisites:     20ES1301-Construction Concrete Technology     Materials     &     Continuous Evaluation:     30       Course Outcomes     Semester End Evaluation:     70     Total Marks:     100       Course Outcomes     Evaluation:     70     Total Marks:     100       Course Outcomes     Evaluation:     70     Kather     Kather       CO1     Explain the principles of SHE management including hazards and accidents in construction site, including safety in excavation     K     K       CO2     Describe the safety measures in handling tools, plants and equipment in construction site, including safety in excavation     K     K       CO3     Explain the risks in underground construction. Regulations, planning and precautions in to be observed during their execution.     K       CO4     Describe the safety precautions in construction. Regulations, planning and precautions in K     K       CO3     Explain the risks in confined spaces     Poit     Poit     Poit     Poit     Poit     Poit     Poit     Poit     2<	Course Category:				HONORS							Credits:			4	
Prerequisites:     20ES1301-Construction Concrete Technology     Materials     &     Continuous Evaluation:     30       Course Outcomes     Semester End Evaluation:     70       Upon successful completion of the course, the student will be able to:     Total Marks:     100       C01     Explain the principles of SHE management including hazards and accidents in construction site, including safety in excavation     K       C02     Describe the safety measures in handling tools, plants and equipment in construction site.     K       C03     Explain the risks in underground construction, & use of explosives, preventive & safety measures to be observed during their execution.     K       C04     Describe the safety practices in building construction, storage of materials and handling, safety     K       C05     Describe the safety practices in building construction. Regulations, planning and precautions in to be observed during their executions.     K       C04     Describe the safety precautions in construction. Regulations, planning and precautions in to be observed during their execution.     K       C05     2     2     2     2     2       C06     P02     P03     P04     P01     P01     P01     P01     P01     P02     P02     P02     P04	Course Type:				Theory							Lecture-Tutorial- Practical:			3-1-0	
Prerequisites:         District Contribution         Interfails         Call         Semester End         70           Course Outcomes         Identified in the principles of SHE management including hazards and accidents in construction         K           CO1         Explain the principles of SHE management including hazards and accidents in construction site, including safety in execuation         K           CO3         Explain the rinciples of SHE management including hazards and accidents in construction site, including safety in execuation         K           CO4         Describe the safety practices in building construction, storage of materials and handling, safety precations in construction in constructions. Regulations, planning and precautions in k         K           CO4         Describe the safety practices in building construction. Regulations, planning and precautions in k         K           CO4         Describe the safety precautions in construction. Regulations, planning and precautions in k         K           CO4         Describe the safety precautions in construction.         K           CO4         Describe the safety precautions in construction.         K           CO5         Describe the safety precautions in construction.         K           CO61         2         2         2         2         2         2         2         2         2         2         2         2         2 <t< td=""><td colspan="2" rowspan="2">Prerequisites:</td><td></td><td colspan="7" rowspan="2">20ES1301-Construction Materials &amp; Concrete Technology</td><td colspan="3">Continuous Evaluation:</td><td colspan="2">30</td></t<>	Prerequisites:			20ES1301-Construction Materials & Concrete Technology							Continuous Evaluation:			30		
Course Outcomes         Total Marks:         100           COI         Explain the principles of SHE management including hazards and accidents in construction         K           CO1         Explain the principles of SHE management including hazards and accidents in construction site, including safety in excavation         K           CO2         Explain the risks in underground construction & use of explosives, preventive & safety measures in civil works in confined spaces         K           CO3         Describe the safety practices in building construction, storage of materials and handling, safety precautions in civil works in confined spaces         K           CO4         Describe the safety precutions in construction. Regulations, planning and precautions in demolition of structures including electrical safety practices         K           CO3         Describe the safety precutions in construction. Regulations, planning and precautions in demolition of structures including electrical safety precutions         FO0         FO1         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z         Z			(								Semester End Evaluation:			70		
Course Outcomes           Upon successful completion of the course, the student will be able to:           COI         Explain the principles of SHE management including hazards and accidents in construction site, including safety measures in handling tools, plants and equipment in construction site, including safety measures in handling tools, plants and equipment in construction site, including safety practices in building construction, storage of materials and handling, safety measures in civil works in confined spaces         K           Cool         Describe the safety practices in building construction, storage of materials and handling, safety preceautions in civil works in confined spaces         Contribution of Course Outcomes towards achievement of Program Outcomes           Contribution of Course Outcomes towards achievement of Program Outcomes           Cool         2         2         2           Cool         2         2         2         2           Cool         2         2         2         2         2           Cool         POI         POI         POI         POI         POI         POI         POI         POI         POI												Total Marks:			100	
Upon successful completion of the course, the student will be able to:         K           CO1         Explain the principles of SHE management including hazards and accidents in construction site, including safety in excavation         K           CO3         Describe the safety measures in handling tools, plants and equipment in construction site, including safety in excavation         K           CO3         Explain the risks in underground construction, storage of materials and handling, safety to be observed during their execution.         K           CO4         Describe the safety practices in building construction, storage of materials and handling, safety demolition of structures including electrical safety practices         K           CO5         Describe the safety precautions in construction. Regulations, planning and precautions in demolition of structures including electrical safety practices         K           CO1         2	Course	Out	comes			_										
CO1       Explain the principles of SFIE management including nazards and accidents in construction       K         CO2       Describe the safety measures in handling tools, plants and equipment in construction site, including safety in excavation.       K         CO4       Describe the safety practices in building construction, storage of materials and handling, safety is be observed during their executions.       K         CO4       Describe the safety practices in building construction. Regulations, planning and precautions in demolition of structures including electrical safety practices       K         Contribution of Course Outcomes towards achievement of Program Outcomes         PO1       PO2       PO3       PO4       PO4       PO1       PO1       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO1       PO3       PO3       PO3       PO1       PO1       PO1       PO3       PO3       PO4       PO1       PO1       PO3       PO3       PO4	Upon s	ucces	stul co	mpleti	on of t	he cou	rse, the	e stude	ent will	be abl	e to:			.:	<sub>V</sub> 2	
CO2       Describe the safety measures in making tools, plants and equipment in construction site.       K         CO3       Explain the risks in underground construction. Storage of materials and handling, safety recautions in civil works in confined spaces       K         CO4       Describe the safety practices in building construction. Regulations, planning and precautions in demolition of structures including electrical safety practices       K         Contribution of Course Outcomes towards achievement of Program Outcomes         Contribution of Structures including electrical safety practices         Contribution of Structures including electrical safety practices         Contribution of Course Outcomes towards achievement of Program Outcomes         Coord 2       2	COI	Expla	the the	princip	les of S	HE ma	handl	ing to	uding i	nazards	and acci	dents in o	onstruct	tion site	<b>K</b> 2	
CO3       Deprime transmission of use of explosites pretentine of study inclusions       K         CO4       Describe the safety preatices in building construction, storage of materials and handling, safety precautions in civil works in confined spaces       K         Co5       Describe the safety precautions in construction. Regulations, planning and precautions in demolition of structures including electrical safety precates       K         Contribution of Course Outcomes towards achievement of Program Outcomes         Co1       0       PO1       PO1 <th col<="" td=""><td>CO2</td><td>inclue</td><td>ling saf</td><td>fety in e</td><td>xcavat</td><td>ion</td><td>Constru</td><td>ction &amp;</td><td>use of</td><td>explosi</td><td>ves pres</td><td>ventive &amp;</td><td>safety n</td><td>ion site,</td><td>K2</td></th>	<td>CO2</td> <td>inclue</td> <td>ling saf</td> <td>fety in e</td> <td>xcavat</td> <td>ion</td> <td>Constru</td> <td>ction &amp;</td> <td>use of</td> <td>explosi</td> <td>ves pres</td> <td>ventive &amp;</td> <td>safety n</td> <td>ion site,</td> <td>K2</td>	CO2	inclue	ling saf	fety in e	xcavat	ion	Constru	ction &	use of	explosi	ves pres	ventive &	safety n	ion site,	K2
CO4         Describe the safety practices in building construction, storage of materials and handling, safety precautions in confined spaces         K           Co5         Describe the safety practicuons in construction. Regulations, planning and precautions in construction. Regulations, planning, and plant, miscellance, and in the prevention:         K           Contribution of Course Outcomes towards achievement of Program Outcomes           Contribution of Course Outcomes towards achievement of Program Outcomes           Contribution of Course Outcomes towards achievement of Program Outcomes           Coore 2         2	CO3	to be	observe	ed durir	ig their	execut	ion.	cuon a	. use of	слрюзі	ves, pre	venuve a	salety i	icasures	K2	
Obscribe the safety precautions in construction. Regulations, planning and precautions in demolition of structures including electrical safety practices       K         Contribution of Course Outcomes towards achievement of Program Outcomes         POI       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO1       PO11       PO12       Ps0       PS0         CO1       2 </td <td>CO4</td> <td colspan="11"><b>Describe</b> the safety practices in building construction, storage of materials and handling, safety precautions in civil works in confined spaces</td> <td>g, safety</td> <td>K2</td>	CO4	<b>Describe</b> the safety practices in building construction, storage of materials and handling, safety precautions in civil works in confined spaces											g, safety	K2		
Contribution of Course Outcomes towards achievement of Program OutcomesPO1PO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12Pso1Pso1CO1222222222222CO22222222222222CO3332222222222CO4222222222222Avg.222222222222Avg.222222222222Introduction-Integration of safety, health and environment (SH & E), SH & Econcept, safety in construction, She policy & planning, hazards, their identification, control & types, Safety programme, education and training. Accident and theirprevention:Introduction, cases of accidents, contributing factors, types, fatgues, their elimination, safe materials handling, Personal protection devices.Safety, Health and Environment (SHE)Management: Introduction, safety policy, guiding principles, SHE targets and goals, contractor's SHE policy, safety objectives & implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.UNIT-1Tools, Plants and other equipment : Concrete pumps, aggregate product	CO5	Desc demo	<b>Describe</b> the safety precautions in construction. Regulations, planning and precautions in demolition of structures including electrical safety practices										K2			
POIPO2PO3PO4PO5PO6PO7PO8PO9PO10PO11PO12PS0PS0CO1222222222222CO2222222222222CO3332222222222CO4222222222222Avg.222222222222Avg.22222222222Introduction-Integration of safety, health and environment (SH & E), SH & Econcept, safety in construction, She policy & planning, hazards, their identification, control & types. Safety programme, education and training. Accident and theirprevention:Introduction, cases of accidents, contributing factors, types, classification of accidents, according to the nature of work, severity, principal causes, preventive measures, safe workplace and working conditions, Types of fatigues, their elimination, safe materials handling, Personal protection devices.Safety, Health and Environment (SHE) Management:Introduction, safety objectives & implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.UNIT-2Tools, Plants and other equipment : Introduction, safety on plants, screening and processing in aggregate mixing plant, asph		Co	ntribut	tion of	Cour	se Out	comes	towa	rds acl	hievem	ent of	Progran	n Outco	mes		
CO1       2 <th2< th=""> <th2< th=""> <th2< th=""></th2<></th2<></th2<>	CO1	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO3       3       3       2       2       2       2       2         CO4       2       2       2       2       2       2       2       2         CO5       2       2       2       2       2       2       2       2       2       2         Avg.       2       2       2       2       2       2       2       2       2       2         Introduction-Integration of safety, health and environment (SH & E), SH & E concept, safety in construction, She policy & planning, hazards, their identification, control & types. Safety programme, education and training. Accident and their prevention: Introduction, cases of accidents, contributing factors, types, classification of acidents, according to the nature of work, severity, principal causes, preventive measures, safe workplace and working conditions, Types of fatigues, their elimination, safe materials handling, Personal protection devices.       Safety, Health and Environment (SHE) Management: Introduction, safety policy, guiding principles, SHE targets and goals, contractor's SHE policy, safety objectives & implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.         Tools, Plants and other equipment : Introduction, safety on plants, screening and processing in aggregate mixing plant, asphalt mixing plants, concrete wibrators, air compressors and air receivers, belt conveyors, cable ways, forklift trucks, hydraulic system, pile driving equipment, concrete pumps, aggregate production equipme			2		2		2	2				2			2	
CO3       3       2       2       2       2       2       2       2         CO4       2 <th2< th="">       2       2       2<td>CO2</td><td></td><td>2</td><td></td><td>2</td><td></td><td>2</td><td>2</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>2</td></th2<>	CO2		2		2		2	2				2			2	
COS       2       2       2       2       2       2       2       2         Avg.       2       1       2       2       2       1       2       1       2       1       2       1       2       1       2       1       2       1       2       1       2       1       1       1       1       1       1       1       1       1       1       1<	C03		2		2		2	2				2		+ +	2	
Coil       2 <th2< th=""> <th2< th=""></th2<></th2<>	C04		2		2		2	2				2			2	
Image       Image <th< td=""><td></td><td></td><td>2</td><td></td><td>2</td><td></td><td>2</td><td>2</td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>2</td></th<>			2		2		2	2				2			2	
<b>Course Content Course Content Introduction</b> -Integration of safety, health and environment (SH & E), SH & E concept, safety in construction, She policy & planning, hazards, their identification, control & types. Safety programme, education and training. Accident and their prevention: Introduction, cases of accidents, contributing factors, types, classification of accidents, according to the nature of work, severity, principal causes, preventive measures, safe workplace and working conditions, Types of fatigues, their elimination, safe materials handling, Personal protection devices.       Safety, Health and Environment (SHE) Management: Introduction, safety policy, guiding principles, SHE targets and goals, contractor's SHE policy, safety objectives & implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.       Tools, Plants and other equipment : Introduction, safety on plants, screening and processing in aggregate mixing plant, asphalt mixing plants, concrete mixing (batching) plants, miscellaneous construction equipment, concrete vibrators, air compressors and air receivers, belt conveyors, cable ways, forklift trucks, hydraulic system, pile driving equipment, concrete pumps, aggregate production equipment (crushing plants), safety in use of tools, hand tools, pneumatic and power tools, jacks, drills.       Safety in excavation work : Introduction, general safety provisions, excavation hazards and safety considerations & requirements, safe slopes, loose side material and minimum berm excavations hear adjacent structures.	Avg.		1- Lo	)W	2		2	2-Me	dium			2	3-High	1 1	2	
UNIT-1Introduction-Integration of safety, health and environment (SH & E), SH & E concept, safety in construction, She policy & planning, hazards, their identification, control & types. Safety programme, education and training. Accident and their prevention: Introduction, cases of accidents, contributing factors, types, classification of accidents, according to the nature of work, severity, principal causes, preventive measures, safe workplace and working conditions, Types of fatigues, their elimination, safe materials handling, Personal protection devices. Safety, Health and Environment (SHE) Management: Introduction, safety policy, guiding principles, SHE targets and goals, contractor's SHE policy, safety objectives & implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.COIUNIT-2Tools, Plants and other equipment : Introduction, safety on plants, screening and processing in aggregate mixing plant, asphalt mixing plants, concrete mixing (batching) plants, miscellaneous construction equipment, concrete vibrators, air compressors and air receivers, belt conveyors, cable ways, forklift trucks, hydraulic system, pile driving equipment, concrete pumps, aggregate production equipment (crushing plants), safety in use of tools, hand tools, pneumatic and power tools, jacks, drills.COI							Cou	rse	Cont	tent						
<b>Tools, Plants and other equipment</b> : Introduction, safety on plants, screening and processing in aggregate mixing plant, asphalt mixing plants, concrete mixing (batching) plants, miscellaneous construction equipment, concrete vibrators, air compressors and air receivers, belt conveyors, cable ways, forklift trucks, hydraulic system, pile driving equipment, concrete pumps, aggregate production equipment (crushing plants), safety in use of tools, hand tools, pneumatic and power tools, jacks, drills.COSafety in excavation work : Introduction, general safety provisions, excavation hazards and safety considerations & requirements, safe slopes, loose side material and minimum berm, excavations near adjacent structures.CO	<ul> <li>UNIT-1</li> <li>UNIT-1</li> <li>Introduction-integration of safety, nearth and environment (SH &amp; E), SH &amp; E concept, safety in construction, She policy &amp; planning, hazards, their identification, control &amp; types. Safety programme, education and training. Accident and their prevention: Introduction, cases of accidents, contributing factors, types, classification of accidents, according to the nature of work, severity, principal causes, preventive measures, safe workplace and working conditions, Types of fatigues, their elimination, safe materials handling, Personal protection devices. Safety, Health and Environment (SHE) Management: Introduction, safety policy, guiding principles, SHE targets and goals, contractor's SHE policy, safety objectives &amp; implementation, objectives with targets and performance indications, SHE Planning, Initial SHE review, risk assessment and its control, legal and other requirements.</li> </ul>								( & E ration, their types, ncipal bes of es. safety safety stions, other	CO1						
and minimum overing event autono neur aujacent or actures, i recettori or emprovees	UNIT-	<ul> <li>processing in aggregate mixing plant, asphalt mixing plants, sortering and processing in aggregate mixing plant, asphalt mixing plants, concrete mixing (batching) plants, miscellaneous construction equipment, concrete vibrators, air compressors and air receivers, belt conveyors, cable ways, forklift trucks, hydraulic system, pile driving equipment, concrete pumps, aggregate production equipment (crushing plants), safety in use of tools, hand tools, pneumatic and power tools, jacks, drills.</li> <li>Safety in excavation work : Introduction, general safety provisions, excavation hazards and safety considerations &amp; requirements, safe slopes, loose side material and minimum berm, excavations near adjacent structures. Protection of employees</li> </ul>												ig and nixing rs, air raulic pment tools, vation aterial oyees	CO2	

Text Boo	ks         1.         S.C. Sharma, Vineet Kumar, Safety, occupational Health and Environ Management in Construction, 2013, Khanna Publishers.	menta						
	Learning Resources	1						
	lamps and appliances, electrical installations, fire, electric shock, inspection and maintenance, general safety precautions.							
UNIT-5	distribution overhead, working around high voltage, mains and apparatus, portable							
	<b>Electrical safety</b> : Introduction, electrical injuries, planning the work, safety provisions related to owners safety related to power transmission, high voltage							
	demolition							
111177 -	walls, partition etc., access to floor, mechanical demolition, general precaution in							
	buildings & multistory building, Demolition planning, precautions before demolition work sequence of demolition and removal of materials demolition of							
	construction, structural joints, fire resistant buildings, fire safety in public assembly							
	regulations, components of a building, stairs and exits, earthquake proof							
	Safety in building construction and demolition: Introduction, general building							
	and efficient storage in the projects, safety precautions for different materials, General provision in material handling							
	handling, storage and handling equipment, safety (protection) of stores, tips for safe							
	mechanization, manual handling, handling by equipment, types of material							
	Safe working conditions, good housekeeping, use of protection devices, extent of							
	<b>Satety in internals handling and storage</b> : Introduction, potential hazards, safe							
	protective equipments (PPEs), general safety precautions Safety in Materials handling and storage : Introduction potential bazards safe							
UNIT-4	procedures, procedures, procedures, procedures, rescue procedures, rescue plans and procedures, permit required for confined spaces, sewer hazards, atmosphere in confined spaces, efficient ventilation, testing the atmosphere, protection from flammable atmosphere, isolation techniques, personal protective againments (PDFa), according as fatture respectives							
	confined space entry procedures, pre-entry planning, work procedures, rescue							
	grouting, guniting and shotcreting.							
	dangerous corners, Structural framework, structural steel erection, Concreting,							
	protection, scaffold, platforms, gangways and runs, ladders, openings and							
	Fall protection, structural framework and concreting: Introduction, fall							
	miscellaneous precautions.							
	ventilation, concreting, grouting and guniting, electrical and lighting &							
	safety for underground machinery scaling and mucking supporting the excavation							
	excavation, drilling, explosive loading and blasting, Water handling, Drainage in							
UNIT-3	vertical / inclined shafts, caverns, safety responsibilities, safety in underground							
INTE 2	Safety in underground works : Introduction, underground excavation, tunnels,							
	substances.							
	explosives, their disposal, drilling, general precautions in loading, wiring, blasting, firing use of safety fuse precautions after blasting Gases and flammable							
	safety from explosives, precautions during storage, transportation, handling, use of							
	Explosives, Drilling and Blasting : Introduction, important terms and definitions,							
	services, quarries, borrow areas etc.							
	large diameter pipes, surface water and drainage, harmful gases, underground							
	shoring, timbering, sheathing, wales, struts, stability of structure, safer practices,							
	and public, use of plant and machinery, responsibilities of in charge te workers,							

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