

4246 – ERECTION ENGINEERING										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
3	4	7	25	50	3Hrs	100	-		175	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total	4
Nil		FAB		75	25	100	50	-	150	

RATIONALE- A technician engaged in structural erection and erection of machinery is required to possess a good knowledge of erection equipment and tools. He should have the required skill in the selection of methods. He is also responsible for directing the erection work and preventing accidents. The course on erection practice aims to develop in the students these abilities. It is suggested that the students should be involved in erection work during their industrial training periods, to supplement their knowledge gained in the institute.

COURSE CONTENTS		Hrs	Mks
1. ERECTION EQUIPMENT		12	30
<p>Basic motions of cranes- Hoisting, luffing, slewing. Types of power plant in crane body and working of crane. Classification of cranes- Mobile, stationary. Types of mobile cranes- Conventional truck crane, crawler cranes, self-propelled wheel type crane- pick and carry cranes and hydraulic cranes, rail mounted cranes, overhead cranes- E.O.T. (Electric Overhead Travel) cranes. Truck cranes- Brief description of main parts, salient features of working, necessity of out rigging. Crawler cranes- Brief description of salient features, situation where used, disadvantages compared to truck cranes. Rail mounted cranes- Brief description, uses. The Guy Derrick- Brief description of construction, situation where it is preferred, working elements, raising of a Guy Derrick- Necessity of raising, brief description of raising operation. Stiff leg Derrick- Description of main parts, situations where used. Traveller crane- Brief description, situation where used. Equipment selection- Factors influencing selection- Variety of small lifts, narrow streets, roadability at the job, economics of initial costs and other costs, speed of load handling. Safety precautions during working of cranes. Other erecting units (description and use)- Gin poles, basket pole, shear legs.</p>			

2. ERECTION TOOLS & MATERIALS	8	16
Manila ropes- Brief description of construction, precaution in storage, strength of rope, handling rope, situations where used. Polypropylene ropes. Wire ropes- Construction, precautions in storing, attachments- Crosby clips, thimbles, wedge sockets, shackles and hooks, preparing spliced eye. Hoisting chains- Inspection. Slings- Manila rope slings- limitations, coil chains-applications, wire rope slings- precautions to be taken while using wire rope sling, polypropylene slings. Types of slings- Endless sling or grommet, choker sling, basket hitch, two leg sling, double basket sling, double choker sling, bridal sling, hitches made from structural steel. Connecting tools (brief description)- Connecting bar, coffering hoist, maul, bull pin, fork wrench, drift pin. Types of winches- Hand winch, power winch.	3	8
3. HANDLING LOADS ON SLINGS	3	
Sling load handling calculations, considerations for correct handling- estimation of centre of gravity, hook position. Use of pads at sharp edges, while placing slings. Use of spreader bars.	3	
4. CHAIN HOISTS		
Brief description and use of the following chain hoists- Spur geared hoist, screw-geared hoist, differential hoist, pull lift hoist. Hoist signals- Hoist load, lower load, rack trolley, travel crane bridge or caterpillar, boom up, boom down, stop, emergency stop, slew boom. Whistle signals for Derrick operations.	2	4
5. HYDRAULIC JACKS & PULLERS- POWER PACK.	4	6
6. READING OF ERECTION DRAWING & DETAILS		
Reading the design drawing and fabrication drawing and preparing a detail erection drawing. Identifying the order of sequence. Locate assembly mark for site of erection. The above should be explained with an example of site erection of an industrial shed.	12	20
7. STEEL ERECTION		
Advance planning- Division and shipping, erection procedure, size and weight. Field operations- Sorting for erection, receiving and unloading, moving to site, erecting, aligning, fastening- precautions in field welding, precautions in site riveting, procedure in bolting. Alignment of equipment on site- Tools of alignment- Plumb bob, spirit level, dial gauge, feeler gauges, water line, tensioned wire, theodolite; Methods of aligning- straightness, eccentricity, radial. Temporary erection materials- Materials framing into structure and acting in conjunction with the structure during erection, false work- typical timber false work, adjustable steel false work. Factors affecting specific erection procedure- Length of time required for erection, equipment available and site-conditions. Erection procedure for simple bridge truss for one span, using false work. Erection procedure for beam and girder bridges. Erection procedure for multi-storey building. Erection procedure for single span and multi-span industrial sheds. Erection procedure for towers. Erection procedure for pressure vessels.	4	8
8. SAFETY AND ERECTION HAZARDS		
Positioning of equipment, materials and men. Caring for environment factors- Illuminations, speed of work, work load, temperature of the place. Care in handling materials, working with machines and tools. Human factor. Use of protective equipment. Safety rules, while using cranes, winches and chain pulley blocks, lifting appliances, slings, scaffolding. Precautions while working at height. Fire safety. Safety for erections in hazardous locations.	48	100
Total		