GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**HYDRAULIC EARTH MOVERS OPERATION AND MAINTENANCE- MOBILE CRANE**
Course Code	ME/2020/017
Course Duration	40 Hours
Minimum Eligibility Criteria	8TH Std
Pre-requisites (if any)	---
Course Objectives	Training module has been designed for the participants to • Understand the parts of Mobile Crane • Understand the working of Mobile Crane • Understand the methods of handling Loads • Understand the need for lubricants and Greasing • Learn driving the vehicle.
Course Outcomes	At the end of training, the participants will be able to ➢ Identify and Explain the parts of Mobile Crane ➢ Operate the Mobile Crane ➢ Operate the equipment with loads ➢ Select and apply proper lubricants ➢ Drive the vehicle
Expected Job Roles	Mobile Crane Operator

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of the Examination
				Min	Max	
ME/2020/017	**HYDRAULIC EARTH MOVERS OPERATION AND MAINTENANCE- MOBILE CRANE**	Theory	20	10	20	3 Hours
		Practical	20	40	80	
		Total	40	50	100	

ME/2020/017 - HYDRAULIC EARTH MOVERS OPERATION AND MAINTENANCE- MOBILECRANE

DETAILED SYLLABUS

Unit No.	Modules	No. of Hours	
		Theory	Practical
I	**Basic Auto Mobile Technology (Common to all Heavy Equipment Modules)**	**08 Hours**	
1.1	Self – Introduction – Introduction of Heavy machineries – Importance of Heavy machineries – Safety procedure	08	
1.2	Maintenance procedure – Important of tolls and list of tools – Importance of wheels and tires –wheels and tires – Maintenance of tires		
1.3	Suspension system –Power plant system		
1.4	Engine and Transmission –Four stroke engine		
1.5	Air system –Diesel system		
1.6	Cooling system - Lubrication system		
1.7	Electrical system		
1.8	Importance of Propeller shaft and differential mechanism - Trouble shooting		
II	**Mobile Crane**	**32 Hours**	
2.1	Introduction of Mobile Crane – Importance of Mobile Crane - Parts of Mobile Crane	12	
2.2	Entering the cabin –Starting the engine – Running the engine after starting – Preparing for road travel		
2.3	Vehicle Control system		
2.4	Operating the Mobile Crane – Operating in slopes – Operating the grippers – Operation on soft ground		
2.5	Transmission system – Brake system – Hydraulic system - Details of Mobile Crane - Safety		
2.6	**Practical**: ➢ Identify and Explain the parts of Mobile Crane ➢ Operation of Mobile Crane ➢ Operation of Mobile Crane with loads ➢ Applying proper lubricants ➢ Driving the truck		20
	Total Theory and Practical Hours	**20**	**20**
	Total Hours	**40**	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1.	Mobile Cranes: Turbo charged 7.79 litre 210KW Power at 1900 rpm Boom Length: 12 to 60m Operating weight: 100 t Hydraulic system with 31 MPA capacity

REFERENCE BOOKS

S.NO.	NAME OF THE BOOK	AUTHOR	PUBLISHER
01	Construction Equipment Management	John E. Schaufelberger and Giovanni C. Migaliaccio	Routledge, New Delhi 2nd Edition, March 2019
02	Construction Equipment Guide	John McElhattan	Kindle Edition
03	Construction Equipment Guide	David A. Day and Neal B.H. Benjamin	John Wiley & Sons, New Jersey, 2nd edition ,May 1991
04	Hydraulic Systems for Mobile Equipment	Timothy W. Dell	Goodheart-Willcox Company, Incorporated, USA, First edition October 2015
05	Heavy Equipment Operations Level 1 Trainee Guide	-	National Center for Construction Education & Research, Florida 3 edition May 2012
06	Heavy Equipment Operations Level 1 Trainee Guide	-	National Center for Construction Education & Research, Florida Second Edition 2006
07	Heavy Equipment Operations Level 3 Trainee Guide	-	National Center for Construction Education & Research, Florida Second Edition, 2006

ASSESSMENT AND CERTIFICATION

S. No.	Criteria for Assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training , Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Aim and Procedure	20
	b)Demonstration / Execution	25
	c) Result & Viva Voce	15
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

ME/2020/017 – HYDRAULIC EARTH MOVERS OPERATION AND MAINTENANCE – MOBILE CRANE

(Maximum Marks: 20)

(N.B: Answer any **Twenty** questions) **20x1= 20 Marks**

1. What is the engine?
2. Define horse power.
3. What are the difference between 2 stroke and 4 stroke engines?
4. How do you control flywheel speed?
5. Define idle speed.
6. What is the need for cooling systems?
7. Mentions parts of water cooling system.
8. How does the oil circulation happen?
9. What is the purpose of fuel injectors?
10. How do you service electrical repairs?
11. Explain battery.
12. List out the parts of mobile crane
13. List the components in the cabin.
14. Discuss about the fulcrum point.
15. What is mean by adjustable cranes.
16. How will you lift the load?
17. How does the elevator works?
18. How will you operate the cranes?
19. What are the procedures to followed when working in soft load?
20. Discuss about the suspension systems.
21. Explain brake systems.
22. What are the precautions to be take while operating in slopes?
23. Explain the maintenance of wheels.
24. Explain the maintenance of tyres.
25. Explain the trouble shooting of propeller shaft.