هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title: **Plant Maintenance - II**
Course Code: **215 MMET**
Program: Mechanical Maintenance Engineering Technology
Department: Mechanical Engineering Technology
College: College of Applied Industrial Technology
Institution: Jazan University
Version: V2022
Last Revision Date : 03-03-2024

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3CR hours				
2. Course type: Theory and Practical					
a.	University ☐	College ☐	Department √	Track☐	Others☐
b.	Required √	Elective			
3. Level/year at which this course is offered: Sixth level/ 3rd Year	3rd level				
4. Course general Description The course helps the students to get familiarized with various machinery working, common problems associated with the machinery and their trouble shooting. Learn the appropriate operation methods by learning the operation limits of the machine. Upgrading the knowledge of problems and solutions for IC engines, compressors, conveyors, CNC machines, and HVAC equipment. Exercising various troubleshooting methods. Highlight the importance of deciding whether to repair or replace a part. Learn the importance and methods of lubrication. Workshop exercises will enhance the knowledge and hand skills of students in the field of mechanical maintenance.					
5. Pre-requirements for this course (if any): nill					
6. Co- requirements for this course (if any): Nil					
7. Course Main Objective(s) The objectives of the course are students to get familiarized with various industrial maintenance strategies associated with machine shops / tool rooms, IC engines i.e. two stroke and four stroke engines, various compressors and hydraulic pumps, material handling equipment's like conveyors, elevators and HVAC systems (heating, ventilation and air-condition systems). Checklist preparation and understanding and following.					

1. Teaching mode (**mark all that apply)**

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	10	100
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	20
2.	Laboratory/Studio	20
3.	Field	4
4.	Tutorial	---
5.	Others (specify)	---
	Total	44

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize various types of machine tools available in the tool room, common problems in machine tools, and maintenance of machine tools. Manipulate mechanical maintenance activities of CNC machines: tool change, work clamp fixing, chip removal & disposal. Lubricant change and monitoring all the gauges.	K1.2	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
1.2	Examine Internal combustion engine types and their parts, working of 2stroke and 4stroke engines. Maintenance of IC engines, Lubricaiton/Overhaul of IC engines & gearboxes.	K1.2	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
…				
2.0	Skills			
2.1	Study the working of the compressor, identify its parts, and Perform the assembly and disassembly activities of	S1.3	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	compressor, maintenance. Troubleshooting,			
2.2	Comprehend various material handling equipment, conveyors, and their maintenance.	S4.1	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
3.0	Values, autonomy, and responsibility			
3.1	Analyzing the root cause of HVAC troubles and understanding the checklist of HVAC,	V1.3	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
3.2	Soft skill: Teamwork in Types of Industries, Problem soving skills in process and product industries, Checklist and job card preparation.	V2.2	active learning, discussion and practical	Practical tasks/ rubrics
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Machine tools and Computer numerical control (CNC) machinery maintenance	8
2.	Internal combustion engine working and maintenance	8
3	Compressors working and maintenance	8
4	Conveyors and material handling equipment maintenance	8
5	HVAC Maintenance	6 & 2Self Study
Total		40

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz #1	4th week	10%
2.	Midterm	6thweek	20%
3.	Assignments & Self study report	3rd week	10%
4	Lab work	All weeks	10%
5	Mini Projects	All weeks	10%
6	Final Exam	As scheduled	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Classroom policy • Maintenance Planning, Coordination and Scheduling 2nd Edtion by Don Nyman and Joel Levitt • Maintenance fundamentals by Kieth and Mobly. 1999 Elsivier, 2nd Edition. • ASME hand books
Supportive References	• Maintenance And Reliability Best Practices. By Ramesh Gulati. Industrial Press.Inc • Handbook on Plant maintenance and Reliability
Electronic Materials	Saudi Digital library: https://sdl.edu.sa/SDLPortal/en/A-ZDataBases.aspx *Provided lecture notes.
Other Learning Materials	• Not utilized

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms should be furnished with 1. White board and appropriate Chairs 2. Laboratory with different testing equipments like Universal testing machine UTM, Universal hardness testing machine (for Brinel, Vickers, Hardness), Torsion test, Deflection of beams, beam bending etc.

Items	Resources
Technology equipment (projector, smart board, software)	Digital board, Computers for data interpretations and printers
Other equipment (depending on the nature of the specialty)	Not utilized

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Confidential student Course Evaluation Survey	Institution	Online Direct Survey
End of semester CLO	Course Coordinator	Direct Survey
Confidential student Course Evaluation Survey	Institution	Online Direct Survey
The extent to which CLOs have been achieved	Students	CLO survey, exams
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods(Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	MET
REFERENCE NO.	CAITMET20243
DATE	03-03-2024