هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title: **Plant Maintenance - I**
Course Code: **112 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 courses introduces the student to the basic definition of machinist terms and state their use, as well as the concepts of plant maintenance, functions and techniques, including preventive maintenance, predictive maintenance, non-destructive testing, troubleshooting, and fault diagnosis. The course is introduced through four classes weekly. They are: 2 classes (2 hour each) for the theoretical part and 2 hours' class for laboratory for which students apply and implement the concepts of the lectures.					
5. Pre-requirements for this course (if any): nill					
6. Co- requirements for this course (if any): Nil					
7. Course Main Objective(s) The main mechanical maintenance activities presented are: lubrication and maintain lubrication system, leveling, alignment, equipment installation, replace packing in a stuffing box, and sealing (the use of sealing devices, manufacture and replace gaskets, replace lip seals and O-rings, remove and reinstall Flowserve U-type mechanical seals), and install different types of bearings. The course also presents the basic maintenance activities for different plants and mechanical systems such as power plants, compressor plants, pumping stations, mechanical power transmission, hydraulic and pneumatic systems, etc. Workshop exercises will enhance the knowledge and hand skills of students in the field of mechanical maintenance.					

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		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	10
2.	Laboratory/Studio	20
3.	Field	---
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	Define the basic terms in maintenance (machinist, basic types of maintenance, and the function of maintenance).	K1.2	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
1.2	Recognize the basic types of maintenance; corrective or breakdown maintenance, scheduled maintenance, preventive maintenance, and predictive maintenance	K1.2	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
…				
2.0	Skills			
2.1	Perform the activities of inspection and testing using precession measuring tools. NDT	S1.3	Lecture, active learning, discussion	Quizzes, Assignments, tutorials & exams
2.2	Manipulate mechanical maintenance activities:	S4.1	Lecture, active learning,	Quizzes, Assignments,

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	lubrication and maintain lubrication system, leveling, alignment, and equipment installation (fit a plain key and a woodruff key, and couplings), replace packing in a stuffing box, and sealing (the use of sealing devices, manufacture and replace gaskets, replace lip seals and O-rings, remove and reinstall Flowserve U-type mechanical seals), and install different types of bearings.		discussion	tutorials & exams
3.0	Values, autonomy, and responsibility			
3.1	Plan and schedule maintenance work so as to anticipate and prevent interruptions in operations.	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.	Machinist terms and the functions of maintenance management.	6
2.	Categories of plant maintenance: preventive and predictive maintenance.	6
3	Testing using telescoping and ball gauges and dial test indicators (DTIs)	6
4	Introduction to non-destructive testing.	8
5	Introduction to troubleshooting and fault diagnosis.	2 & Self Study

6	Selection of some mechanical maintenance activities: lubrication and maintain lubrication system, leveling, alignment, and equipment installation (fit a plain key and a woodruff key, and couplings), replace packing in a stuffing box, and sealing (the use of sealing devices, manufacture and replace gaskets, replace lip seals and O-rings, remove and reinstall Flowserve U-type mechanical seals), and install different types of bearings.	12
Total		10

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.
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