



Mechanical Engineering Dept. Department

Syllabus

ME 424: Maintenance Engineering (3-0-3)

Course Catalog Description:

Introduction to maintenance engineering; Condition monitoring of machines, plants & structures, various methods of condition monitoring: vibration acoustic emission, temperature, etc. and their practical applications. Interpreting the results of condition monitoring. Economics of Maintenance, Optimal maintenance strategies: Inspection intervals planning for the maintenance crew, forecasting the spare parts and determining optimal stocking policy

Course Objectives:

1. to enable the student to apply the different approaches of condition monitoring and diagnosis of industrial machines
2. cover the different aspects of machine condition monitoring such as economics of maintenance.

Course Learning Outcomes:

- CLO1. Understand the fundamentals of maintenance engineering
- CLO2. Demonstrate knowledge of economic factors and optimal maintenance strategies
- CLO3. Demonstrate basic knowledge of methods used in conditional monitoring.
- CLO4. Use the graphical and numerical tools to model and optimize the preventive and condition based maintenance policies.
- CLO5. Estimate the resources capacity needed in the maintenance planning
- CLO6. Acquire new knowledge related to reliability and decision modelling their applications to maintenance problems
- CLO7. Use commercial software as a design tool

Learning Resources:

- S. O. Duffuaa, A. Raouf and J. D. Campbell, Planning and Control of Maintenance System, John Wiley & Sons, Inc., 1999, new edition 2015.

Lecture Assessment Plan:

Assessment Task	Week Due	Weight
Project (Report + Presentation)	15	15.0%

Assessment Task	Week Due	Weight
Final exam	16	30.0%
Quizzes	3, 6, 9, 12	10.0%
Major Exams (2)	7, 11	35.0%
Assignments	Bi-weekly	10.0%

Lecture Weekly Schedule:

Week#	Topics
1	Principles of Maintenance Management
	Classification of Maintenance Types
2	Classification of Maintenance Types (Continue)
3	Planning and Scheduling of Maintenance works
4	Planning and Scheduling of Maintenance works (Continue)
	Condition monitoring of machines, plants
5	Condition monitoring of machines, plants (Continue)
6	Condition monitoring of machines, plants (Continue)
7	Condition monitoring of machines, plants (Continue)
	Various methods of condition monitoring: vibration acoustic emission, temperature, etc. and their practical applications.
8	Various methods of condition monitoring: vibration acoustic emission, temperature, etc. and their practical applications. (Continue)
9	Various methods of condition monitoring: vibration acoustic emission, temperature, etc. and their practical applications. (Continue)
10	Economics of Maintenance, Optimal maintenance strategies
11	Economics of Maintenance, Optimal maintenance strategies (Continue)
	Inspection intervals planning, Spare parts Management.
12	Inspection intervals planning, Spare parts Management. (Continue)
13	Inspection intervals planning, Spare parts Management. (Continue)
	Maintenance Management Systems (BMS)
14	Maintenance Management Systems (BMS) (Continue)
	Computerized Maintenance Management Systems (CMMS)
15	Computerized Maintenance Management Systems (CMMS) (Continue)