

**Course Code :** ME 793

**Course Title :** Condition Monitoring & Diagnostic Expert Systems

**Credit Hours :** 3

### **Course Description**

Condition monitoring definition and overview, Equipment and system failure, Techniques of predicting failures, Techniques of predicting failures, Infrared thermography, Oil analysis and tribology, Ultrasonic, Motor current analysis, Equipment and component reliability, Equipment optimization, Application of engineering expert systems.

### **Course Objectives**

Understand the main concepts of condition monitoring techniques.  
Understand the architecture and characteristics of engineering expert systems.  
Use available expert system for condition monitoring.

### **Course Topics**

- Week no. 1: Condition monitoring definition and overview.
- Week no. 2: Equipment and system failure.
- Week no. 3: Techniques of predicting failures.
- Week no. 4: Vibration measurement and analysis.
- Week no. 5: Infrared thermography.
- Week no. 6: Oil analysis and tribology.
- Week no. 7: Oil analysis and tribology. / 7<sup>th</sup> week evaluation.
- Week no. 8: Ultrasonic.
- Week no. 9: Motor current analysis.
- Week no. 10: Equipment and component reliability.
- Week no. 11: Equipment optimization.
- Week no. 12: Engineering expert systems / 12<sup>th</sup> week evaluation
- Week no. 13: Application of engineering expert systems.
- Week no. 14: Classic and contemporary examples.
- Week no. 15: Presentation on selected topics.
- Week no. 16: Final Examination

### **References**

- J. H. Willias, Alan Davies and Peter R. Drake, "Condition – Based Maintenance and Machine Diagnostics", Amazon, Latest edition.

- Trevor M. Hunt, "Condition Monitoring of Mechanical and Hydraulic Plant", Amazon, Latest edition.
- Alan Davies, "Handbook of Condition Monitoring- Techniques and Methodology", Latest edition.
- R. Schalkoff, " Pattern Recognition: Statistical, Structural and Neural Approaches," John Wiley &sons, Latest Edition.