



C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: - Mechanical Engineering
SEMESTER: - VIII
CODE: - 4TE08PEM1
NAME – Plant Engineering and Maintenance

Teaching & Evaluation Scheme:-

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE08PEM1	Plant Engineering and Maintenance	4	0	2	6	5	30	1.5	70	3	---	20	30	150

Objectives:-

1. To enable the student to understand the principles, functions and practices adapted in industry for the successful management of maintenance activities.
2. To explain the different maintenance categories like Preventive maintenance, condition monitoring and repair of machine elements.
3. To illustrate some of the simple instruments used for condition monitoring in industry.

Prerequisites: - Basic knowledge of Elements of mechanical engineering and Production technology.

Course outline:-

Sr. No.	Course Contents	Hours
1	Organisation of Plant Engineering : Principles of Plant management functions. Classification of maintenance work- Routine maintenance, emergency work, service work, preventive maintenance. Project work, Corrective work, Assessment of maintenance work. Performance and productivity measurement; problem solving techniques. Statistical processes. Parato chart. Manpower planning and training for maintenance and safety staff.	10
2	Plant Facilities :	10

	Basic Plant facilities, (a) Building: Types of Building structures, Ventilation and lighting, Roads and parking. (b) Electrical power generation, distributions, utilisation, stand by units. (c) Heating, ventilation and Air conditioning. (d) Water supply, Purification, use and disposal. (e) Sanitation. (f) Planning and estimation of auxiliary services, such as water, steam, compressed air.	
3	Layout Planning : Layout of facilities-Types of layouts, selection of layout. Group technology aspect. P. Q. Analysis, PQRS analysis, material flow, REL charts, space requirements, space diagram. Use of computer for optimization of layouts.	08
4	Maintenance Management Practice : Various types of maintenance, breakdown, preventive, periodic or predictive, condition based maintenance as predictive preventive maintenance. Online or off-line, concept of health as well as usage monitoring. Quantitative decision making for selection of maintenance system & management classification of material. Maintenance problems occurring in product and process type industries and Power plants and their management. Total production maintenance.	12
5	Preventive Maintenance and Life Cycle Costing : Periodic Preventive Management - Scheduled maintenance and period for P.M. Life cycle cost taking into consideration maintenance, reliability, hazard function etc. Life cycle costing: Rigorous models, mathematical formulation etc.	10
6	Plant Safety issues : Safety management: fire protection and prevention - safety against mechanical hazards, chemical hazards- accident prevention program- Industrial noise - Pollution control- Waste disposal - Recycling of waste - legal provisions for safety in industry.	10

Learning Outcomes: Students will be able to...

1. Recognize troubles in mechanical elements.
2. Assemble, dismantle and align mechanisms in sequential order
3. Carry out plant maintenance using preventive maintenance.

Text Books:

1. Terotechnology & Reliability Engineering by **A. K. Gupta** , McMillan Co.
2. Industrial Maintenance Management by **Sushikumar Srivastava** , S.Chand and Co.Ltd., New Delhi.
3. Handbook of Plant Engineering by **R.C. Rosaler** , McGraw Hill.ISBN 0070521646.

References Books:

1. Terotechnology: Reliability Engineering and Maintenance Management by **B.Bhadury and S.K. Basu** , Asian Books, New Delhi 2002.
2. Maintenance, Replacement & Reliability by **A. K. S. Jardine** , HMSO, London.
3. Mechanical fault Diagnosis and Condition Monitoring by **R.A. Collacatt**, Chapman and Hall Ltd.ISBN 0412129302
4. Handbook of Maintenance Engineering by **Higgin**, McGraw Hill.
5. Material, Handling equipment by **Rudenko**, MIR:- Publication
6. Bulk Material Handling, Handbook by **Jacob Fruchlboum**, CBS Publisher & distributor, ISBN 8123905416
7. Industrial Maintenance by **Jacob Fruchlboum**, S. Chand and Co. New Delhi, ISBN8121901685