3ME42: TOTAL PRODUCTIVE MAINTENANCE
CREDITS - 4 (LTP: 3,1,0)

Course Objective:
To understand the concepts of total productive maintenance for productivity enhancement.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				
L	T	P	C	Theory Marks		Practical Marks		Total Marks
				ESE	CE	ESE	CE	
3	1	0	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Maintenance Concepts:** Origin and development of Total Productive Maintenance (TPM) ,Objectives and functions, Reliability Centered Maintenance (RCM), maintainability prediction, availability and system effectiveness, maintenance costs, maintenance organization.	7
2	**Maintenance Models:** Minimal repair, maintenance types, Preventive maintenance methodology, balancing Preventing Maintenance (PM) and breakdown maintenance, PM schedules: deviations on both sides of target values, PM schedules: functional characteristics, replacement models.	8
3	**Total Productive Maintenance:** Zero breakdowns, Zero Defects and TPM, maximizing equipment effectiveness, autonomous maintenance program, Eight pillars of TPM, TPM small group activities, TPM organization, management decision, educational campaign creation of organizations, establishment of basic policies and goals, formation of master plan, TPM implementation.	10
4	**Maintenance Logistics:** Human factors in maintenance, maintenance manuals, maintenance staffing methods, queuing applications, simulation, spare parts management, maintenance planning and scheduling and interpretation (analysis) process capability, Acceptance sampling, sampling plans, operating characteristic (OC) curves and average outgoing quality (AOQ) curves	10
5	**Online Monitoring:** Condition Monitoring Techniques, Vibration Monitoring, Signature Analysis, Wear Debris Monitoring, Maintenance Management Information System, Expert systems, Corrosion Monitoring and Control.	7
	Total	**42**

List of References:

1. Mishra, R. C., Pathak, K., "*Maintenance Engineering and Management*", 2nd Edition, Prentice – Hall of India.
2. Steven Borris, "*Total Productive Maintenance*", McGraw-Hill.
3. Terry Wireman, "*Total Productive Maintenance*", 2nd Edition, Industrial Press, 2004.
4. Tina Kanti Agustiady, Elizabeth A. Cudney, "*Total Productive Maintenance: Strategies and Implementation Guide*", Productivity Press, 2015.
5. Kern Peng, "*Equipment Management in the Post-Maintenance Era: A New Alternative to Total Productive Maintenance (TPM)*", Productivity Press, 2012.
6. David J. Sumanth, "*Total Productivity Management (TPmgt): A Systematic and Quantitative Approach to Compete in Quality, Price and Time*", Productivity Press, 1997.
7. Fumio Gotoh, Masaji Tajiri, "*Autonomous maintenance in Seven Steps: Implementing TPM on the ShopFloor*", Productivity Press, 1999.
8. Seiichi Nakajima, "*Total Productive Maintenance*", Productivity Press, 11th edition, 1988

Course Outcomes (COs):

At the end of this course students will be able to …

1. Outline the concept of Total Productive Maintenance (TPM).
2. Identify tools of TPM implementation.
3. Explain the roles and responsibilities of people in organization in context of TPM.
4. Appreciate the benefits of TPM.
5. Understand the need for modern monitoring and maintenance techniques for critical equipment.