

RO8006 MAINTENANCE AND SAFETY ENGINEERING

DETAILED SYLLABUS

OBJECTIVES:

- To impart knowledge in maintenance
- To know about the fundamentals of maintenance and to implement it.
- To study about safety engineering practices.
- To analyze the hazards in protection.
- To know about the safety in machine operation.

UNIT I MAINTENANCE

Types – breakdown, preventive, predictive, TPM; elements of preventive maintenance – checklist, schedule, procedure.

UNIT II TOTAL PRODUCTIVE MAINTENANCE

Principles; preparatory stages of implementation – TPM organisation structure, creation; basic TPM policies and aids, master plan. TPM IMPLEMENTATION: Small group activities, autonomous maintenance, establishing planned maintenance, training, developing equipment management program.

UNIT III SAFETY SYSTEMS ANALYSIS

Definitions, safety systems; safety information system: basic concept, safety cost / benefit analysis; industrial safety engineering, OSHA regulations.

UNIT IV HAZARD ANALYSIS

General hazard analysis: electrical, physical and chemical hazard, detailed hazard analysis. Cost effectiveness in hazard elimination. Logical analysis: map method, tabular method, fault tree analysis and hazop studies. FIRE PROTECTION SYSTEM: Chemistry of fire, water sprinkler, fire hydrant, alarm and detection system. Suppression system: CO₂ system, foam system, Dry Chemical Powder (DCP) system, halon system, portable extinguisher.

UNIT V SAFETY IN MACHINE OPERATION

Design for safety, lock out system, work permit system, safety in use of power press, cranes. Safety in foundry, forging, welding, hot working and cold working, electroplating and boiler operation. SAFETY AND LAW: Provisions in factory act for safety, explosive act, workmen compensation act, compensation calculation. Boiler act and pollution control act.

TEXT BOOKS:

1. John Ridley, "Safety at Work", Butter Worth Publisher, Oxford, 1997.
2. Robinson C J and Ginder A P, "Implementing TPM", Productivity Press, USA, 1995.

REFERENCES:

1. Dhillon B S, "Maintainability, Maintenance and Reliability for Engineers", CRC Press, 2006.

2. Heinrich H W, "Industrial Accident Prevention", National Safety Council, Chicago, 1998.
3. National Safety Council, "Personal Protective Equipment", Bombay, 1998.
4. National Safety Council, "Accident Prevention Manual for Industrial Operations", Chicago, 1995.
5. Patrick A Michaud, "Accident Prevention and OSHA Compliance", CRC Press, 1995.
6. Derek James, "Fire Prevention Handbook", Butter Worth & Co., Oxford, 1991.
7. Dan Peterson, "Techniques of Safety Management", 1990.