Course Name: EQUIPMENT MAINTENANCE & TROUBLE SHOOTING

Mode: Offline Credits: 5 (3L+2T) BMICCT 501

Aim of the course:

The aim of this course is to equip students with the knowledge, skills, and best practices required to ensure the optimal functioning of industrial and mechanical equipment.

Course Objective:

- To understand the principles and best practices of preventive and predictive maintenance for various types of industrial equipment.
- To identify common causes of equipment failure and develop systematic approaches to diagnosing and resolving issues.
- > To gain hands-on experience in using tools and techniques for effective equipment troubleshooting.
- To enhance knowledge of maintenance planning, scheduling, and documentation for improved reliability and performance.
- To familiarize students with safety standards and procedures associated with equipment maintenance and troubleshooting tasks.
- To develop skills for condition monitoring and the application of diagnostic technologies for fault detection.

Sr no.	Graduate attributes	Mapped Modules
CO 1	Emergency Care and Life Support Skills	MODULE I
CO 2	Introduction To Medical Equipment Technology	MODULE II
CO 3	Comprehending The Working of Basic Equipment's	MODULE III
CO 4	Calibration And Maintenance of Basic Equipment's	MODULE IV
CO 5	Knowledge Of Equipment and Departmental Practicum	MODULE V

Learning objectives:

- Understand the principles and importance of preventive maintenance for industrial and mechanical equipment.
- Identify the common tools, techniques, and best practices used in routine maintenance tasks.
- > Recognize the symptoms and causes of equipment malfunctions and failures.
- Develop skills to conduct systematic troubleshooting and diagnostics on malfunctioning equipment.

Module	Content	Total	% of	Bloom	Remarks, if
Number		Hours	questions	Level (applicable)	any
THEORY		•			
MI	Emergency Care and Life Support Skills	9	20		NA
MII	Introduction To Medical Equipment Technology	9	20		NA
M III	Comprehending The Working of Basic Equipment's	9	20		NA
M IV	Calibration And Maintenance of Basic Equipment's	9	20		NA
MV	Knowledge Of Equipment and Departmental Practicum	9	20		NA
Total Theory		45	100		
TUTORIAL		30			
TOTAL		75			

Detailed syllabus:

MODULE I: EMERGENCY CARE AND LIFE SUPPORT SKILLS

Basics of emergency care and life support skills, a. Vital signs and primary assessment, Basic emergency care – first aid and triage, Ventilations including use of bag-valve-masks (BVMs), Choking, rescue breathing methods, One- and Two-rescuer CPR, Using an AED (Automated external defibrillator).Managing an emergency including moving a patient, Disaster preparedness and management, Fundamentals of emergency management, Preparedness and risk reduction, Incident command and institutional mechanisms, Resource management

MODULE II: INTRODUCTION TO MEDICAL EQUIPMENT TECHNOLOGY

Introduction of medical equipment technology-I: Basic theory of operation, function and clinical application of a range of medical devices, such as infusion pumps, heart monitors, blood pressure monitors, pulse oximeters, suction, devices, and centrifuges.

MODULE III: COMPREHENDING THE WORKING OF BASIC EQUIPMENTS

Introduction to medical equipment technology- II: testing various medical devices for proper operation, computerized equipment control and record keeping Safety issues related to patients and Biomedical Equipment Technology, Basic theory of operation, function, clinical application and operation testing of a range of medical devices

MODULE IV: CALIBRATION AND MAINTENANCE OF BASIC EQUIPMENTS

Safety procedural guidelines - Precautions while handling the radioactive rays, Precautions while handling the high voltage circuits, Securing the equipment and surroundings while repairing the equipment son the spot, Shock and vibrations, maintaining the safety of the patient in the vicinity, Installation, Maintenance and Servicing of Medical Equipment, Maintenance of records: Maintenance and coding of various types of the log book for the machines in various departments of the hospital.

MODULE V: KNOWLEDGE OF EQUIPMENT AND DEPARTMENTAL PRACTICUM

Principles of medical device, Clinical use and principle of operation of different types and models, Hands-on experience in installation, set-up, operation, routine maintenance, internal components and functional verification testing, Demonstration of Cleaning and safety measures, Features and Setup of equipment's and its routine use to hospital staff, Information to hospital staff about use of equipment - Risk Factor associated with the use of equipment – Complexity - Manufacturer's instruction and specification - Effective use of instruments, Demonstration of documentation and recording of equipment to hospital staff - Reading of instrument/equipment, Recording, Record maintenance.

Suggested Readings:

- Qualifications pack occupational standards for allied healthcare, Medical Equipment Technology, Health sector skills council
- 2. Diploma for biomedical courses, Sri Ramachandra University
- Curriculum Documents for Medical Electronics, Maharashtra State Board of Technical Education, Mumbai
- WHO's Medical Equipment maintenance programme: <u>http://apps.who.int/medicinedocs/documents/s21566en/s21566en.pdf</u>

Course Name: LAW & MEDICAL ETHICS

Mode: Offline Credits: 5 (3L+2T) BMICCT 502

Aim of the course:

The aim of this course is to provide students with a comprehensive understanding of the legal principles and ethical considerations that govern medical practice and healthcare decision-making.

Course Objective:

- Develop a comprehensive understanding of legal principles relevant to healthcare practice.
- > Explore the ethical foundations and theories that influence medical decision-making.
- Analyze the relationship between law, ethics, and professional responsibilities in healthcare.
- Examine key legal concepts such as patient consent, confidentiality, and malpractice.
- > Understand regulatory frameworks governing healthcare institutions and professionals.
- > Evaluate ethical dilemmas in clinical practice and apply ethical decision-making models.

Sr no.	Graduate attributes	Mapped
		Modules
CO 1	Introduction To Medical Ethics	MODULE I
CO 2	Medical Ethics Systems	MODULE II
CO 3	Principles Of Medical Ethics	MODULE III
CO 4	Ethical Considerations in Abortion, Aids/HIV Infection and Reproductive Technologies	MODULE IV
CO 5	Death And Dying	MODULE V

Learning objectives:

- Understanding Legal Foundations
- > Describe the concept of informed consent and its legal implications.
- > Understand the legal obligations related to patient confidentiality.
- > Define medical negligence and differentiate it from malpractice.

Module	Content	Total	% of	Bloom	Remarks, if
Number		Hours	questions	Level (applicable)	any
THEORY					
MI	Introduction To Medical Ethics	9	20		NA
M II	Medical Ethics Systems	9	20		NA
M III	Principles Of Medical Ethics	9	20		NA
M IV	Ethical Considerations in Abortion, Aids/HIV Infection and Reproductive Technologies	9	20		NA
M V	Death And Dying	9	20		NA
Total Theory		45	100		
TUTORIAL		30			
TOTAL		75			

Detailed syllabus:

MODULE I: INTRODUCTION TO MEDICAL ETHICS

History and general principles of medical ethics, History, Medical ethics/research ethics. Concept and elements of informed consent. Limits of the law. Theory of liability. Duty of disclosure. Quality of consent. Vulnerable Subjects Rightful Authority Competence to consent. Justifications for not obtaining consent

MODULE II: MEDICAL ETHICS SYSTEMS

Hippocratic Tradition, Cross Cultural Perspectives in Medical Ethics: Eastern Europe Islam China India Japan, Role of Codes: Rules/Guidelines/Ethics Penalties (US Govt.), Covenants/Contracts

MODULE III: PRINCIPLES OF MEDICAL ETHICS

The concepts of health and disease, extraordinary importance, Scope of medicine, Relationship between health and disease, Normativism vs. Non-normativism Proponents, Ethical issues in organ transplantation, Morality of organ transplantation, Determination of death, Supply of organs. Selection of patients –criteria, Allocation of a scarce resource

MODULE IV: ETHICAL CONSIDERATIONS IN ABORTION, AIDS/HIV INFECTION AND REPRODUCTIVE TECHNOLOGIES:

Limiting Procreation, Contraception, voluntary sterilization and the duty to Procreate, Abortion: Rights/Privacy Status of the fetus. Constitutional status of abortion Law and morality. Rights of Fathers Rights of Minors Public Funding Medical interventions for fetuses, Naturalness or artificiality of the new technologies. Moral status of the early human embryo. Role of the family genetic lineage. Role of the government. Artificial Insemination in Vitro Fertilization Surrogate Parenthood Genetic Screening and Testing Gene mapping and sequencing of the human genome. Ethical and public policy issues. Freedom and Coercion Confidentiality and Disclosure Access Benefits and Harm Genetic Engineering Ethical and Public Policy Issues

MODULE V: DEATH AND DYING

Definition of Death, Ethical framework for life support decisions. The incompetent patient. Controversial moral constraints. Withholdings and withdrawing life support.

Suggested Readings:

- Medical Ethics: A Very Short Introduction (2nd edn), Michael Dunn and Tony Hope, Publisher: Oxford University Press Print Publication Date: Nov 2018Print ISBN-13: 9780198815600
- 2. "Principles of Biomedical Ethics" by Tom L. Beauchamp and James F. Childress
- 3. Legal And Ethical Issues For Health Professionals Paperback Import, 17 December 2014 by George D. Pozga
- 4. Clinical Ethics: A Practical Approach to Ethical Decisions in Clinical Medicine, Seventh Edition, Book by Albert R. Jonsen, Mark Siegler, and William J. Winslade