

NIELIT KOHIMA

Course: - Diploma in Repair and maintenance of ICCU Equipments

Duration :- 6 Months (480 Hrs)

1. Basic of Electronics and overview of Biomedical Industries. 20 hours

- a) Resistors, Capacitors, Inductors, Conductor, Insulator, Semiconductors, Diodes, Kirchhoff's Law, Ohms Law, Parallel Series Connection, Rectifier, Transistors, Power and Energy, Primary and Secondary cell, Logic gates, Half adder and Full adder, Multiplexer, De-multiplexer, Encoder, Decoder, Voltage, Current, Faradays Law of Electromagnetism, Self and Mutual Inductance. Basic of magnetism and Electromagnetism. Types of Filters.
- b) Biomedical Careers in Industry.
- c) Effective communications
- d) Transitioning from Academic to Industrial Science.
- e) To be a team player.

2. Human anatomy and physiology. 40 hours

Intro to Human Body, Cell Structure and Function, Skeletal System, Muscular System, Nervous System, Nervous System, Endocrine System, Lymphatic System, Respiratory System, Digestive System, Reproductive System

3. Concepts, Principles and Fundamentals of Medical Instrumentation. 60 Hours

Electrodes- Bio-electric Signals, Bio Electrodes, Electrode Tissue Interface, Contact Impedance, Types of Electrodes, Electrodes used for ECG, EEG and Electrodes, Transducers- Typical signals from physiological parameters, Pressure Transducer, Temperature Transducer, Pulse Sensor, Respiration Sensor, Recording System, PC Based Instrumentations, Type of medical equipments-diagnostic, therapeutic and laboratory equipments, patient safety

4. Bio Medical Equipments Repair and Maintenance. 30 Hours

Block diagram description and application of the following Instruments

- ECG Machine: Basics, Block Diagram, Circuit Diagram, Repair and Maintenance
- EEG Machine: Basics, Block Diagram, Circuit Diagram, Repair and Maintenance
- EMG Machine : Basics, Block Diagram, Circuit Diagram, Repair and Maintenance
- X-Ray: Basics, Block Diagram, Circuit Diagram, Repair and Maintenance
- Ultrasound : Block Diagram and cards, Repair and Maintenance

5. Patient Monitoring System. 20 Hours

Heart Rate Measurement, Pulse Rate Measurement, Respiration Rate Measurement, Blood Pressure Measurement, Principle of defibrillator and pace maker

6. Test, Measurement and Calibrating of Instruments. 30 Hours

Digital Voltmeter, Multimeter, Digital Storage Oscilloscope, Function Generator, Simulators, Test and Calibrating Instruments, Use of Test and Calibrating Equipments, Confirming Specifications, Measurement of Output Quantity, Testing Repeatability of Results.

Practical 280 Hours

1. Study of Internal Parts in Open Conditions

X-Ray (30mA, 50 mA), Pulse Oximeter, ECG, EEG, EMG, Multi Para Monitor, Defibrillator, Blood Pressure Meter, Physiotherapy Equipments, Surgical Diathermy, Colorimeter, Ultrasound Doppler. Ventilator, OT Lamp, Pace Maker, Oxygen Concentrator, Infusion Pump

7. Project

Assembling and Testing of any of the following Instruments.

1. X-Ray/Portable X – Ray
2. Physiotherapy equipments
3. Blood pressure Machine
4. ECG
5. EEG
6. EMG
7. Multi para Monitor