

Annexure - III

Model Curriculum Job Code 1

Job Code: IBSC / BME / 01

Qualification Title: Certificate in Biomedical Engineering

Occupation(s) to which the qualification give access: Junior Biomedical Engineer
/ Junior Biomedical Technician

Course Curriculum:

BM01: Anatomy and Physiology

BM02: Fundamentals of Electricity and Electronics

BM03: Biomedical Instrumentation

BM04: Hospital Engineering and Management

BM05: Medical Terminology for Engineers

Module Overview:

BM01 Anatomy & Physiology

- Systems, Respiratory, Gastrointestinal, Nervous, Circulatory, Musculoskeletal, Endocrine
- Organs: Heart, Lungs, Liver, Kidneys, Brain, Gallbladder, Pancreas & Others.
- Blood: Components, Metabolism

BM02 Fundamentals of Electricity and Electronics

- Calculations and Conversions: Hex /Decimal/Binary
- Devices: Active Devices, Solid State Devices, Analog & Digital, Passive, Active, Digital Circuits and Components
- Operational Amplifier, Power Supplies, Common Base/ Emitter/ Collector Transistor Circuits; E AC Power - Transformer, CRTs, X-Ray tubes, Photomultipliers.
- Test Equipment
- Power Distribution and Storage Systems: Transformers, Distribution, Batteries, UPS / Line Conditioning

BM03 Biomedical Instrumentation

- Fundamentals of Medical Instrumentation: Bioelectric Signals and Physiological Transducers.
- Operation, functional circuit details: Patient Safety, Repair, Service and Maintenance of a range of medical equipment
- Mechanical Equipment: BP Apparatus, Suction Machine and Microscope. Recording and Monitoring Equipment: ECG and EEG Machines, Pulse, Oximeter, Cardiac Monitor and Audiometer.
- Clinical Lab Equipment: Colorimeter, Spectrophotometer, Semi-Auto Analyzer, Centrifuge and Oven. Imaging Systems: X-Ray and Ultrasound Machines.
- Therapeutic Equipment: Cardiac Defibrillator, Short wave and Ultrasonic Diathermy. Anesthesia Machine.
- Maintenance of pc based medical equipment: Introduction to - System configuration and BIOS, Identification & Troubleshooting of PC components viz-Motherboard, HDD, FDD, CD ROM, Monitor, Printers, Modems, Ports etc. Installation and operation of - Windows Operating System, Antivirus Software, Internetworking.

BM04 Hospital Engineering and Management

- Hospital various departmental Planning & Design (Radiology Dept, Nuclear Medicine, ICU, Central Sterilisation and OTs). BME services in hospitals - Role & responsibilities. Setting up of BME dept in a Hospital (Requirements & facilities).
- Hospital electrical supply & power systems - Hospital electrical systems, general power & lighting systems, Hospital wiring systems. Electrical safety, isolated power supply, line isolation monitor, IPS in patient care areas, concept of Micro and Macro shock, Earthing schemes, Generator sets, UPS & voltage stabilizers. Causes of failures of electrical supply & ways to minimize them.

BM05 Medical Terminology for Engineers

- Disease and Treatment

- Circulation, Blood and Immunity
- Respiration and Digestion
- Urinary and Male Reproductive System
- Female Reproductive System, Pregnancy and Birth
- Endocrine and Nervous Systems, Behavioral Disorders
- The Senses
- The Skeleton and Muscular Systems
- The Skin

Career Graph for Certificate in Biomedical – (Engineer / Technologist)

