PBM7D002 PROSTHETIC DESIGN

Module-I

Introduction to artificial organs: Biomaterials used in artificial organs and prostheses, Rheological properties of blood, blood viscosity variation, Casson equation, flow properties of blood, problems associated with extra corporeal blood flow;

Module-II

Artificial kidney: kidney filtration, artificial waste removal methods, hemodialysis, equation for artificial kidney and middle molecule hypothesis. Hemodialysers, mass transfer Analysis, regeneration of dialysate, membrane configuration, wearable artificial kidney machine, separation of antigens from blood in ESRD patients; Artificial heart lung machine: lungs gaseous sexchange/ transport, artificial heart-lung devices. Oxygenators, Liver support system, artificial pancreas,

Module-III

Blood and skin; Audiometry: air conduction, bone conduction, masking, functional diagram of an audiometer. Hearing aids, Opthalmoscope, etinoscope, I. A. B. P principle and application; Rehabilitation Engineering: Impairments, disabilities & handicaps, measurement & assessment, engineering concepts in sensory & motor rehabilitation. Engg. Concept in communication disorders, Rehabs for locomotion, visual, speech & hearing, Artificial limb & hands, prosthetic heart valves, Externally powered & controlled orthotics & prosthetics, Myoelectric hand & arm prostheses, marcus intelligent hand prostheses, gait study, spinal rehabilitation.

Books

1. Gerald EMiller, Artificial Organs, Morgan & Claypool, 2006
2. Kondraske, G. V, Rehabilitation Engineering. CRC press1995