Syllabus:

Introduction: biomedical engineering design, engineering approaches to clinical challenges, clinical problems requiring implants/devices for solution; Materials for biomedical implants and devices; Implantable devices and systems: Vascular and cardiovascular devices, pacemakers, heart valves, stents, synthetic grafts, orthopedic implants, intraocular lens implants, cochlear implants; Wearable devices: Assistive devices for the blind, foetal movement, finger movement, gait analyzer, ventricular assist devices, energy harvesting; Implantable neural prostheses and nerve stimulation: Brain, visual prosthesis, cochlear implants, spinal cord stimulation, cardiology system, artificial limbs; Minimally invasive devices and techniques: Instrumentation for Laparoscopic Surgery, Ocular Surgery; Imaging and image-guided techniques: endoscopy, medical ultrasound devices, medical X-ray imaging, imaging-aided design of personalized devices and assistive reproduction technology; Rehabilitation Engineering: Deafness, blindness, passive and active Orthoses and Prostheses.

Texts/Reference Books:

8. ASM Handbook Volume 23, Materials for Medical Devices