RAI 822: Medical Devices and Robotics

Textbook

1. Handbook of biomedical instrumentation, 3rd edition by R.S. Khandpur.

Objective

3. The objective of this course is to develop expertise in the use of Robotics and Artificial Intelligence technologies for medical devices and associated Robotics applications.

Course Outcome

4. After studying this course students will be well familiarize with various Artificial Intelligence machine vision and Robotic technologies used in medical technologies with a special focus on Diagnosis and Rehabilitation.

Course Outline

Topics	Allocated Periods
☐ Fundamentals of Medical Instrumentation	45
☐ Bioelectric signals and electrodes	
☐ Physiological transducers	
☐ Blood flow and cardiac output measurement	
☐ Principle of X-ray imaging	
☐ Principle of X-ray computed tomography	
☐ Principle of magnetic resonance imaging	
☐ Ultrasonic imaging systems	
☐ Electroencephalography signals and its applications	
☐ Magnetoencephalography	
☐ Electromyography	
☐ Principle and analysis of Electrocardiogram (ECG) signals	
☐ Functional near-infrared spectroscopy Continuous-wave fNIRS systems	
☐ Frequency-domain fNIRS systems	