



<b>COURSE CONTENT:</b>		
<b>UNIT I</b>	<b>FUNDAMENTALS OF BIOMEDICAL ENGINEERING</b>	<b>9</b>
Cell and its structure – Resting and Action Potential – Nervous system – Basic components of a biomedical system- Cardiovascular systems- Respiratory systems - Biomechanics of soft tissues - Basic mechanics of spinal column and limbs- Transducers – selection criteria – Piezo electric, ultrasonic transducers - Temperature measurements - Fibre optic temperature sensors.		
<b>UNIT II</b>	<b>BIOMEDICAL MEASUREMENT</b>	<b>9</b>
Electrodes –types-Amplifiers - ECG – EEG – EMG – ERG - Electrical safety in medical environment, shock hazards – leakage current-Instruments for checking safety parameters of biomedical equipments.		
<b>UNIT III</b>	<b>NON ELECTRICAL PARAMETERS MEASUREMENT AND DIAGNOSTIC PROCEDURES</b>	<b>9</b>
Measurement of blood pressure - Cardiac output - Heart rate - Heart sound - Pulmonary function measurements – spirometer – Photo Plethysmography, Body Plethysmography – Blood Gas analysers, pH of blood –measurement of blood pCO <sub>2</sub> , pO <sub>2</sub> , finger-tip oxymeter - ESR, GSR measurements.		
<b>UNIT IV</b>	<b>PULMONARY MEASUREMENT AND BIO TELEMETRY</b>	<b>9</b>
Physiology of respiratory system – Respiratory rate measurement – wire and wireless Biotelemetry – Telemetering multiple information – implanted transmitters – causes of electrical hazards and safety techniques.		
<b>UNIT V</b>	<b>MEDICAL IMAGING SYSTEM</b>	<b>9</b>
Ultrasound scanner – Echo cardiography – Coloar Doppler system – CAT and CT scan – MRI Imaging – Cine angiogram – LASER Imaging – Endoscope.		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Leslie Cromwell, Biomedical Instrumentation and Measurement, Prentice hall of India, New Delhi,2007.</li> <li>2. Joseph J.carr and John M. Brown, Introduction to Biomedical Equipment Technology, John Wileyand sons, New York, 4th Edition, 2012.</li> <li>3. Khandpur R.S, Handbook of Biomedical Instrumentation, , Tata McGraw-Hill, New Delhi, 2nd Edition, 2003.</li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. John G. Webster, Medical Instrumentation Application and Design, John Wiley and sons, NewYork, 1998.</li> <li>2. Duane Knudson, Fundamentals of Biomechanics, Springer, 2nd Edition, 2007.</li> <li>3. Suh, Sang, Gurupur, Varadraj P., Tanik, Murat M., Health Care Systems, Technology and Techniques, Springer, 1st Edition, 2011.</li> <li>4. Ed. Joseph D. Bronzino, The Biomedical Engineering Hand Book, Third Edition, Boca Raton, CRC Press LLC, 2006.</li> <li>5. M.Arumugam, 'Bio-Medical Instrumentation', Anuradha Agencies, 2003.</li> </ol>		