Certificate Course in Bio-medical Instrumentation under CBCS pattern (w.e.f. 2022-2023 onwards)
Department of Physics, Kakatiya University, Warangal

Certificate Course in Bio-medical Instrumentation **Course Duration:3 Months**

Paper code	Comp. code	Title of the paper	Internal Exam Marks	End Exam		Total Max. Marks	Total Min. Marks	No. of credits
				Max. Marks	Min. Marks			
		Theory						
B-1	B01	**Paper –I:Electro-Physiological measurements**	10	40	16	50	20	02
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B-2	B02	**Paper- II: Imaging and Therapeutic Equipment**	10	40	16	50	20	02
Total						**100**		**04**

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Paper-I: Electro-Physiological measurements

Unit I: **10Hrs**

Radiation, Transducers and Electro-Physiological measurements:

Radiation biohazards, Ionizing and non-ionizing radiation hazards, radiation detecting equipment. Transducers: Different types – Piezo-electric, ultrasonic, resistive, capacitive, inductive transducers - Selection criteria. Physiology of heart and lungs, circulation and respiration, ECG, EEG, EMG, ERG and recording methods - Typical waveforms.

Unit II: **10Hrs**

Non-electrical parameter measurements:

Measurements of blood pressure, Cardiac output, Cardiac rate, Heart sound, Respiratory rate, Gas volume, Flow rate of CO_2, O_2 in exhaust air, PH of blood, ESR, GSR measurements, Plethysmography.

TEXT BOOKS :

1. Bio-Medical Instrumentation and Measurements - Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer, 2nd edition, Pearson Edn, 2002 /PHI.
2. Hand Book of Bio-Medical Instrumentation - R. S. Khandpur, Tata McGraw Hill Publishing Co. Ltd., 2003.

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REFERENCE BOOKS:

1. Bio-Medical Instrumentation - M. Arumugam, Anuradha Agencies, 2003.
2. Principles of Applied Bio-Medical Instrumentation - L. A. Geddes and L. E. Baker, John Wiley & Sons, 1975.
3. Medical Instrumentation - J. Webster, John Wiley & Sons, 1995.
4. Principles of Medical Electronics and Bio-Medical Instrumentation - C. Raja Rao and S. K. Guha, Universities Press (India) Ltd., Orient Longman Ltd., 2000.

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Paper- II: Imaging and Therapeutic Equipment

Unit I: **10 Hrs.**

Medical Imaging and PMS: X-ray machine, Radio graphic and fluoroscopic techniques, Computer tomography, MRI, Ultrasonography, Endoscopy, Thermography, Different types of biotelemetry systems and patient monitoring.

Unit II **10 Hrs.**

Assisting and Therapeutic equipment: Pacemakers, Defibrillators, Ventilators, Nerve and muscle stimulators, Diathermy, Heart and Lung machine, Audio meters, - Dializers.

TEXT BOOKS :

1. Bio-Medical Instrumentation and Measurements - Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer, 2nd edition, Pearson Edn, 2002 /PHI.
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1. Bio-Medical Instrumentation - M. Arumugam, Anuradha Agencies, 2003.
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