INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM

INTRODUCTION OF NEW COURSE

<table>
<tr><td>Course Title</td><td>Biomedical Instrumentation</td><td>Course Code</td><td colspan="4">BM5XXX</td></tr>
<tr><td>Dept./ Specialization</td><td>Sciences and Humanities</td><td>Structure (LTPC)</td><td>3</td><td>1</td><td>0</td><td>4</td></tr>
<tr><td>To be offered for</td><td>UG/PG</td><td>Status</td><td colspan="2">Core ☐</td><td colspan="2">Elective ■</td></tr>
<tr><td>Faculty Proposing the course</td><td>Dr. A. Gowri,</td><td>Type</td><td colspan="2">New ■</td><td colspan="2">Modification ☐</td></tr>
<tr><td colspan="2">Recommendation from the DAC</td><td>Date of DAC</td><td colspan="4"></td></tr>
<tr><td>External Expert(s)</td><td colspan="6">Dr. V V Raghavendra Sai, Associate Professor, Applied Mechanics, IITM
Dr. Renu John, Professor, Biomedical Engineering, IITH</td></tr>
<tr><td>Pre-requisite</td><td colspan="2">CoT</td><td colspan="2">Submitted for approval</td><td colspan="2">47th Senate</td></tr>
<tr><td>Learning Objectives</td><td colspan="6">This course is intended
● To visualize the application of engineering concepts for the design of medical diagnostic equipment.
● To identify the regulatory standards for conventional biochemical analysis.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="6">On successful completion of the course, the students will be able to:
● Appraise the instrumentation design for acquisition of biosignals.
● Explain the medical device design standards and biosafety regulatory frameworks.</td></tr>
<tr><td>*** See rationale at the end

Contents of the course (With approximate break-up of hours for L/T/P)</td><td colspan="6">Biopotentials and Bioelectrodes: Introduction to Cell potential – Action potential and Resting potential, Origin of biopotentials and propagation, Electrode-electrolyte interface and types of bioelectrodes (L8 + T3)
Introduction to Biosignals: Origin and characteristics of ECG, EEG, EMG, EOG, ERG biosignals (L8+T3)
Instrumentation: Instrumentation governing biosignal acquisition, Design of bioamplifiers and filters for biosignal acquisition (L10 +T3)
Sensors for Physiological parameters: Instruments for measurement of pulse rate, respiration rate, blood flow, body temperature and blood pressure (L8 + T3)
Biomedical instrument regulations: Medical device design standards, Micro/Macroshock hazards, Biosafety regulations(L8 + T2)</td></tr>
<tr><td>Textbooks</td><td colspan="6">1. “Medical Instrumentation – Application and Design, Fifth edition” John G Webster and Amit J Nimunkar, ISBN: 978-1-119-45733-6, John Wiley & Sons, Inc. (2020).
2. “Transducers for Biomedical Measurements: Principles and Applications” Richard S. C. Cobbold, ISBN: 9780471161455, A Wiley-Interscience publication (1974).</td></tr>
<tr><td>Reference Books</td><td colspan="6">1. “Handbook of Biomedical Instrumentation Third edition” R.S. Khandpur, ISBN: 9789339205430, McGraw Hill Education Pvt. Ltd (2014).
2. “Introduction to Biomedical Equipment Technology, Fourth edition” Joseph J. Carr & John M. Brown, ISBN: 9780130104922, Pearson publishers (2000).</td></tr>
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