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

INTRODUCTION OF NEW COURSE

<table>
<tr><td>Course Title</td><td colspan="2">Introduction to Biomedical Engineering</td><td>Course Code</td><td colspan="4"></td></tr>
<tr><td>Dept./ Specialization</td><td colspan="2">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 colspan="2">UG</td><td>Status</td><td colspan="2">Core ☐</td><td colspan="2">Elective ■</td></tr>
<tr><td>Faculty Proposing the course</td><td colspan="2">Dr. A. Gowri and Dr. Uttam M. Pal</td><td>Type</td><td colspan="2">New ■</td><td colspan="2">Modification ☐</td></tr>
<tr><td colspan="3">Recommendation from the DAC</td><td>Date of DAC</td><td colspan="4"></td></tr>
<tr><td>External Expert(s)</td><td colspan="6">1) Prof. Rohit Srivastava, Professor, Biosciences and Bioengineering, IIT Bombay
2) Prof. Nagarajan Ganapathy, Assistant Professor, Biomedical Engineering, IIT Hyderabad</td></tr>
<tr><td>Pre-requisite</td><td colspan="2">None</td><td colspan="2">Submitted for approval</td><td colspan="2">49th Senate</td></tr>
<tr><td>Learning Objectives</td><td colspan="6">This course is intended
• To introduce the students with the field of biomedical engineering.
• To impart knowledge on various diagnostic and therapeutic equipments.
• To explain the fundamentals of the prosthetic devices.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="6">On successful completion of the course, the students will be able to:
• Determine the role of biomedical engineering in clinical interpretation.
• Understand the working principles of various medical equipments.
• Appreciate the role of biomedical engineers in the society.</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">Introduction to Biomedical Engineering: Evolution of modern healthcare system, Basics of human physiology, Role of Biomedical engineers, Professional status of biomedical engineering, professional societies. (L9 + T3)
Bioinstrumentation: General constraints in design of medical instrumentation systems, Introduction to Diagnostic equipment, therapeutic equipment and assistive devices (L10 +T3)
Biomaterials: Materials in Medicine: From Prosthetics to Regeneration, Biomaterials: Properties, Types, and Applications, Tissue–Biomaterial Interactions, Application-Specific Strategies for the Design and Selection of Biomaterials (L7 + T3)
Biomechanics: Introduction, Basic Mechanics, Mechanics of Materials, Viscoelastic Properties of Cartilage, Ligament, Tendon, and Muscle, Clinical Gait Analysis (L7 + T3)
Bioimaging: X-ray imaging, computed tomography (CT), Magentic resonance imaging (MRI), Diagnostic Ultrasound imaging (L7 + T2)
BioNanotechnology: Nano-level material, physics, fabrication, and applications.
Ethics in Biomedical Engineering: Regulation of Medical Device Innovation, Marketing Medical Devices, Ethical Issues in Feasibility Studies and treatment (L2)</td></tr>
<tr><td>Textbooks</td><td colspan="6">1. Enderle, John D, Bronzino, Joseph D, Blanchard, Susan M- Introduction to Biomedical Engineering-ElsevierInc2ndedition,2005.
2. R S Khandpur, Handbook of biomedical instrumentation, 3rd ed., 2014, ISBN:9789339205430, McGraw Hill Education, Pvt. Ltd.</td></tr>
<tr><td>Reference Books</td><td colspan="6">1. Christe, B., Introduction to Biomedical Instrumentation, The technology of patient care, 2nded., 2017,ISBN:9781107185012, Cambridge University Press.
2. Joseph J. Carr & John M. Brown, Introduction to Biomedical Equipment Technology, 4th ed., 2000, ISBN:9780130104922, Pearson publishers.</td></tr>
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