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

INTRODUCTION OF NEW COURSE

<table>
<tr><td>Course Title</td><td>Energy Harvesting Technology</td><td>Course Code</td><td colspan="4">INT6XXX</td></tr>
<tr><td rowspan="2">Dept./ Specialization</td><td rowspan="2">Inter Disciplinary</td><td rowspan="2">Structure (LTPC)</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td>3</td><td>1</td><td>0</td><td>4</td></tr>
<tr><td>To be offered for</td><td>PG/PhD</td><td>Status</td><td colspan="2">Core ☐</td><td colspan="2">Elective ▬</td></tr>
<tr><td>Faculty Proposing the course</td><td>Dr. Pandiyarasan Veluswamy</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">31/07/2021</td></tr>
<tr><td>External Expert(s)</td><td colspan="6">Assoc. Prof. Ir. Dr. Mohd Faizul Mohd Sabri (University of Malaya)
Professor. Abhijit Majumdar (Indian Institute of Technology, Delhi)</td></tr>
<tr><td>Pre-requisite</td><td></td><td colspan="3">Submitted for approval</td><td colspan="2">45th Senate</td></tr>
<tr><td>Learning Objectives</td><td colspan="6">• This course will provide recent harvesting small-scale energy that has attracted immense research efforts for applications such as wireless sensor networks for health monitoring, implantable devices, and biosensors.
• It shows the energy sources and their characteristics for energy harvesting, including piezoelectric, photovoltaic cells, and thermoelectric generators.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="6">After the completion of the course, students will be able:
• To have a broad appreciation of the potential applications for energy harvesting sources and uses of energy.
• Knowledge to apply and develop the model to solve the technological energy problem
• Understanding the design, analysis, and selection energy harvesting processes for different applications, technology, economic, environmental, and societal aspects.
• To better grasp the benefits of energy harvesting and explain general ways to save energy at a personal, community and global level.</td></tr>
<tr><td>Contents of the course
(With approximate break-up of hours for L/T/P)</td><td colspan="6">• Energy Harvesting Basics; Energy Sources - Renewable/ Non-Renewable; Potential Global Energy Crisis; Climate Change and Sustainability (7 L, 2T)
• Waste Energies and Their Meso-macro-scale Energy Harvesting; Energy states in matter and Kinetic formulation; Energy Harvesting for Battery-less Information Technologies (8L, 2T)
• Piezoelectric Harvesters; RF Harvesting; Thermoelectric Generators; Solar Harvesting and Triboelectric nanogenerators (16L, 4T)
• Power Conversion Circuits; Strategies for Enhancing the Performance of Energy Harvester; Energy Combiner and Power Manager for Multi-Source Energy Harvesting; Future Directions and Scope (11L, 4T)
Tutorial will include research paper analysis and discussion</td></tr>
<tr><td>Text Book</td><td colspan="6">1. Nicu Bizon, Naser Mahdavi Tabatabaei, Frede Blaabjerg and Erol Kurt, "Energy Harvesting and Energy Efficiency Technology, Methods, and Applications", Springer 2017.</td></tr>
<tr><td>Reference Books</td><td colspan="6">1. Mohammad Alhawari, Baker Mohammad, Hani Saleh, Mohammed Ismail, "Energy Harvesting for Self-Powered Wearable Devices", Springer 2018.
2. Shashank Priya and Daniel J. Inman, "Energy Harvesting Technologies", Springer 2009.
3. Ling Bing Kong, "Waste Energy Harvesting - Mechanical and Thermal Energies", Springer 2014.</td></tr>
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