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

REVISION OF AN ELECTIVE COURSE

<table>
<tr><td>Course Title</td><td>Additive Manufacturing</td><td>Course Code</td><td colspan="4"></td></tr>
<tr><td>Dept./ Specialization</td><td>Mechanical Engineering</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. Senthilkumaran K</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">01-06-2021</td></tr>
<tr><td>External Expert(s)</td><td colspan="6">Professor Ramesh Babu, Department of Mechanical Engineering, IIT Madras.</td></tr>
<tr><td>Pre-requisite</td><td colspan="2">Basics Manufacturing Processes</td><td colspan="2">Submitted for approval</td><td colspan="2">45th Senate</td></tr>
<tr><td>Learning Objectives</td><td colspan="6">The objective of the course is to impart fundamentals of additive manufacturing processes along with the various file formats, software tools, processes, techniques and applications along with hands on tutorial sessions.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="6">At the end of the course, the students will be able to decide between the various trade-offs when selecting AM processes, devices and materials to suit particular engineering requirements. Students will have in-depth knowledge in latest trends and opportunities in AM, including distributed and direct digital manufacturing, mass customization, and how to commercialize their ideas. Additionally the students will also be able to adopt the process with the selection of suitable parameter values upon the part materials and strength.</td></tr>
<tr><td>Contents of the course (With approximate break-up of hours for L/T/P)</td><td colspan="6">Introduction to the Basic Principles of Additive Manufacturing, Additive Manufacturing Processes, Extrusion, Beam Deposition. (7L +1T)

Jetting, Sheet Lamination, Direct-Write, Photopolymerization, Sintering, Powder Bed Fusion. (8 + 3T)

Design/Fabrication Processes: Data Sources, Software Tools, File Formats, Model Repair and Validation, Pre- & Post-processing, Designing for Additive Manufacturing, Multiple Materials, Hybrids, Composite Materials, current and future directions. (10 + 4T)

Process & Material Selection, Direct Digital Manufacturing and Distributed Manufacturing, Related Technologies: Mold-making, Rapid Tooling, Scanning. (8 + 4T)

Applications of AM: Aerospace, Automotive, Biomedical Applications of AM. (5 + 2T)

Product Development, Commercialization, Trends and Future Directions in Additive Manufacturing. (4 + 2T)</td></tr>
<tr><td>Text Book</td><td colspan="6">1. Gibson, Rosen, Stucker, Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing. Springer, 2009.</td></tr>
<tr><td>Reference Books</td><td colspan="6">1. Hopkinson, Hague, Dickens, Rapid Manufacturing: An Industrial Revolution for the Digital Age. Wiley, 2005.
2. Gibson, Advanced Manufacturing Technologies for Medical Applications. Wiley, 2005.
3. Chee Kai Chua, Kah Fai Leong, Chu Sing Lim, Rapid prototyping, World Scientific, 2010.</td></tr>
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