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

<table>
<tr><td>Course Title</td><td>Additive Manufacturing</td><td>Course No</td><td colspan="3">To be allotted later on by the office</td></tr>
<tr><td>Specialization</td><td>Mechanical Engineering</td><td>Structure (IPC)</td><td>3</td><td>0</td><td>3</td></tr>
<tr><td>Offered for</td><td>B.Tech MDM, DD, and M.Des. MDS</td><td>Status</td><td colspan="2">Core ☐</td><td>Elective ▬</td></tr>
<tr><td>Pre-requisite</td><td></td><td>To take effect from</td><td colspan="3"></td></tr>
<tr><td>Objectives</td><td colspan="5">Students will develop a rich knowledge of additive manufacturing processes, devices, capabilities and materials. Students will learn the trade-offs between subtractive and additive manufacturing processes and technologies, along with the various software tools, processes and techniques enabling additive manufacturing and personal fabrication.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">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.</td></tr>
<tr><td>Contents of the course

(With approximate break up of hours)</td><td colspan="5">Introduction to the Basic Principles of Additive Manufacturing, Additive Manufacturing Processes, Extrusion, Beam Deposition (8)

Jetting, Sheet Lamination, Direct-Write, Photopolymerization, , Sintering, Powder Bed Fusion (8)

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 (11)

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

Applications of AM: Aerospace, Automotive, Manufacturing, Architectural Engineering, Art, Jewelry, Toys and many more. Biomedical Applications of AM: Medical, Biomedical, Dental, Bio-printing, Tissue & Organ Engineering and many others (5)

Product Development, Commercialization, Trends and Future Directions (4)</td></tr>
<tr><td>Text and References</td><td colspan="5">Text Book:
1. Gibson, Rosen, Stucker, Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing. Springer, 2009.

Reference Book:
2. Hopkinson, Hague, Dickens, Rapid Manufacturing: An Industrial Revolution for the Digital Age. Wiley, 2005.
3. Gibson, Advanced Manufacturing Technologies for Medical Applications. Wiley, 2005.</td></tr>
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