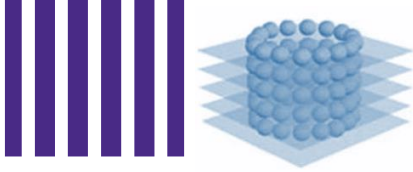


The background features a repeating pattern of circular icons depicting various 3D printing processes such as laser cutting, extrusion, and powder bed fusion. Additionally, there are vertical white bars on the top right and bottom left corners.

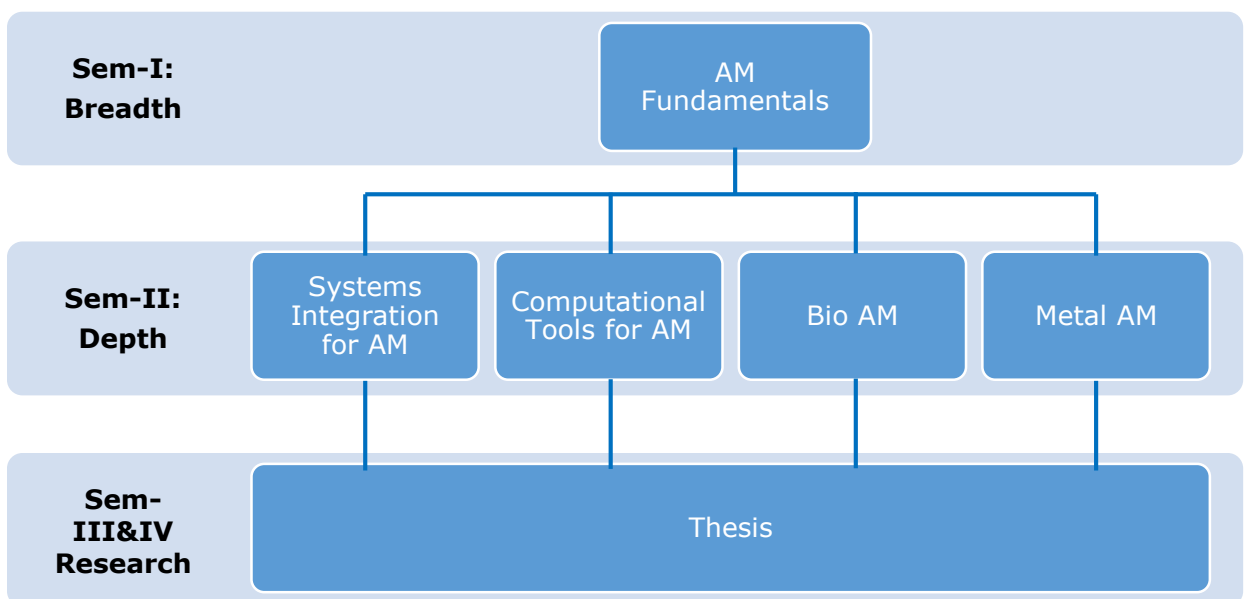
Interdisciplinary MTech in
Additive Manufacturing
@ IIT Hyderabad



Background

- The primary objective of this interdisciplinary MTech program is to generate qualified human resources for taking up challenging careers in Additive Manufacturing (AM) industries.
- The course is designed to capture the interdisciplinary nature of AM technologies and equip students with specialized knowledge in the field of AM. The course contents cover both fundamental scientific principles and applied engineering aspects of AM technologies.
- Special emphasis is laid on imparting hands-on skills to the students in designing and building parts various AM technologies.
- The course leverages the strong eco-system of AM research at IITH, thus providing the students an opportunity to conduct research at the forefronts of AM technologies.

Course Outline





Course Structure

| Course Title | Credits |
|--|---------|
| Semester I | |
| Fundamentals of Additive Manufacturing | 3 |
| Product Design and Prototyping | 2 |
| Biofabrication | 2 |
| Materials for Additive Manufacturing | 2 |
| English for Communication | 1 |
| Elective course(s) <i>(from any one or more of the four elective baskets)*</i> | 3 |
| Sub-total | 15 |
| Semester II | |
| Biofabrication Technology Lab | 1 |
| Additive Manufacturing Processes Lab | 1 |
| Industrial Lectures | 1 |
| Elective courses <i>(from any one or more of the four elective baskets)**</i> | 12 |
| Sub-total | 15 |
| Semester III and IV | |
| Thesis | 24 |
| Total Credits | 52 |

*Elective Courses in Semester I (the list is not exhaustive)

| Basket | Course Title | Credits |
|---|--|---------|
| Systems Integration for Additive Manufacturing | Life Cycle Analysis | 1 |
| | Elasticity & Plasticity | 1.5 |
| | Computational Tools for Geometric Modelling | 1.5 |
| Computational Techniques for Additive Manufacturing | Finite Element Methods | 3 |
| | Mathematical Methods for Engineers | 3 |
| | Augmented Reality & Virtual Reality | 1 |
| Bio Additive Manufacturing | Biomaterials: Materials in Medicine | 2 |
| | Lab on Chip | 1 |
| | Advanced Fabrication | 2 |
| | Microfluidic Platform for Cell Culture & Diagnostics | 1 |
| Metal Additive Manufacturing | Metal Additive Manufacturing | 3 |
| | Advanced Physical Metallurgy | 3 |
| | Powder Metallurgy Manufacturing | 3 |
| | Materials Synthesis and Characterization | 3 |



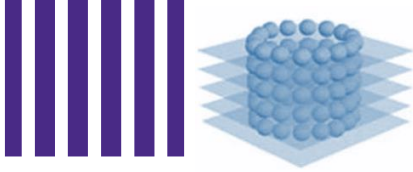


Course Structure

**Elective Courses in Semester II (the list is not exhaustive)

| Basket | Course Title | Credits |
|--|--|---------|
| Systems Integration for Additive Manufacturing | Computational Fluid Dynamics | 1.5 |
| | Fluid Mechanics and Heat Transfer | 1.5 |
| | Industry 4.0 | 1.5 |
| | Design for Additive Manufacturing | 1 |
| | Finite Element Analysis | 3 |
| Computational Techniques for Additive Manufacturing | Introduction to Computational Methods in Materials Science | 3 |
| | Advanced Topics in Mathematical Tools | 3 |
| | Machine Learning and Its Applications | 3 |
| | Topology Optimization with Additive Manufacturing | 1 |
| Bio Additive Manufacturing | Tissue Engineering | 2 |
| | Biomechanics | 2 |
| | 3D Printing in Medicine | 2 |
| | Biomaterials - Materials in Medicine | 3 |
| | Introduction to Microfluidics and Microreactors | 2 |
| Metal Additive Manufacturing | Metallurgy of Welding and Additive Manufacturing | 3 |
| | Structure and Characterization of Metallic Materials | 3 |
| | Advanced Mechanical Behaviour of Materials | 3 |
| | Microstructure Engineering for Advanced Manufacturing | 3 |
| | Advanced Thermodynamics of Materials | 3 |
| | Thermo-Mechanical Processing of Materials | 3 |
| | Advanced Material Joining Processes | 1.5 |





AM at IIT Hyderabad



Teaching/Courses

- More than 300 UG and PG students attending 3D Printing courses every year



Equipment

- Wide range of AM processes for printing metals, ceramics, composites, and plastics; Software for design and simulations



Outreach

- Regular TEQIP courses on AM
- Tailored AM workshops for Industry



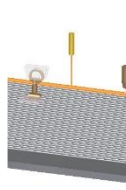
Faculty

- More than 15 faculty working in AM, spanning across various departments



Conferences

- Three international conferences co-organized with Keio University, Japan and Deakin University, Australia



Projects

- More than 10 ongoing sponsored projects in the field of AM; A major Center of Excellence in AM is coming up!

Eligibility & Admission Procedure

- **MHRD Fellowship:** Candidates with valid GATE score in {AE, ME, MT, PI, BM, BT, CH, XE, XL} and a BTech/BE in the relevant field. Admission is based on GATE Score of Candidates. For IIT Undergraduates with a CGPA of 8.0 or above, GATE is not essential.
- **Self-Sponsored candidates:** Candidates having BTech/BE in relevant field of Engineering and Technology with minimum CGPA of 7.0 or equivalent. This is a non-subsidized program and no financial support is provided to the students. The fee for this program is approximately 10 Lakh rupees for two years. For self-sponsored candidates, GATE score is not mandatory. Admission is based on Written Test/Interview.
- **Candidates sponsored by Govt. Labs/Public Sector Units:** Candidates working in Government or Public sector institutes (including armed forces) with more than 2-year experience and having a basic BTech/BE degree in relevant field. GATE score is not mandatory. Admission is based on Written Test/Interview.
- For more information, please contact: Prof. G. D. Janaki Ram jram@msme.iith.ac.in
Dr. S. Suryakumar ssurya@mae.iith.ac.in

