Interdisciplinary MTech in

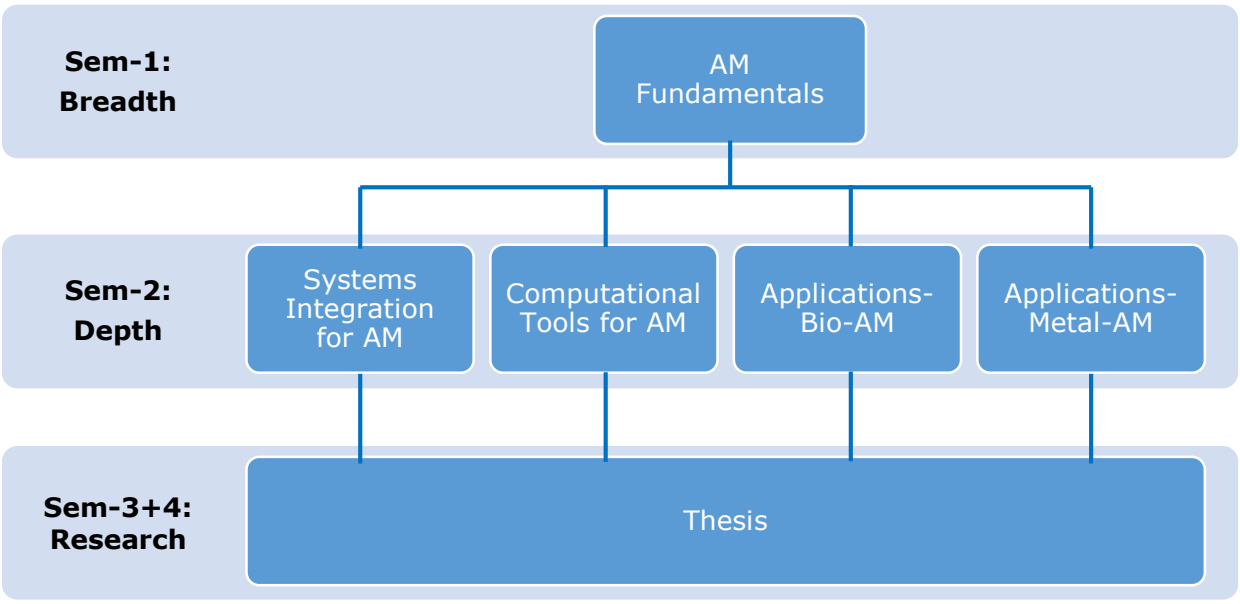
Additive Manufacturing

@ IIT Hyderabad

Background: Additive Manufacturing

- The primary objective of this interdisciplinary MTech is address the gap between the emerging Additive Manufacturing (AM) applications and lack of trained engineers in this field.
- The course is designed to equip students to understand and advance AM by combining fundamental understanding of the underlying science along with as specialized study of different processes and technologies.
- The course will also focus on capturing the interdisciplinary nature of the AM through providing provide hands-on experience with designing, adapting and building parts using current AM technology.
- It leverage the strong eco-system of AM research at IITH, thus providing the students an opportunity to carry on research in a variety of AM Applications.

Course Outline



Course Structure

Sem-1	Fundamentals of Additive Manufacturing	3
	Product Design and Prototyping	2
	Biofabrication	2
	Materials Science of Additive Manufacturing	2
	Basket-1: Systems Integration for AM Life Cycle Analysis (1cr) Elasticity & Plasticity (1.5cr) Computational Tools for Geometric Modelling (1.5cr)	Any 3 credits
	Basket-2: Computational Tools for AM Finite Element Methods (3cr) Intro to Computational Methods in MSME (3cr) Reverse Engineering (1cr)	
	Basket-3: Applications- Bio-AM Biomaterials- Materials in Medicine (3cr) Lab on Chip (1cr) BioDevices (2cr)	
	Basket-4: Applications- Metal-AM Materials Synthesis and Characterization (3cr) Powder Metallurgy Manufacturing (3cr) Mechanical behaviour of materials (2cr)	
	Sub-Total =	*12*
Sem-2	AM Processes Lab	1
	Biofabrication Lab	1
	Basket-1: Systems Integration for AM Fluid Mechanics and Heat Transfer (1.5cr) Computational Fluid Dynamics (1.5cr) 3D Printed Microfuidlics (2cr) Design for AM (1cr) Industry 4.0 (1.5cr)	Any 10 credits
	Basket-2: Computational Tools for AM Finite Element Analysis (3cr) Advanced Topics in Mathematical Tools (3cr) AI and ML for Engineering Design (1cr) Topology Optimization with AM (1cr)	
	Basket-3: Applications- Bio-AM Biomicrofluidics (2cr) Tissue Engineering (2cr) 3D Printing in Medicine (2cr)	
	Basket-4: Applications- Metal-AM Advanced Material Joining Processes (1.5cr) Thermo-mechanical processing of Materials (3cr) Microstructural Design for Advanced Manufacturing (3cr) Metal Additive Manufacturing Metallurgy (3cr)	
	Sub-Total =	*12*
Common	English for Communication	1
	Industry Lectures	1
Thesis	Thesis (2nd Year)	24
	TOTAL =	**50**

AM at IIT Hyderabad

Teaching/Courses

- More than 300 students taught 3D Printing every year
- Both UG and PG level courses

Equipment

- Wide array of AM-processes for Metal, BioMedical, Composites, Polymers, Multi-colour.

Outreach

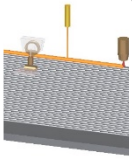
- Regular TEQIP courses on AM
- Tailored AM workshops for Industry including Cyient, Tata Steel etc.

Faculty

- More than 15 faculty working in AM, spanning Biomedical, Chemical, Design, Material Science and Mechanical

Conferences

- Three events of International Conferences co-organized together with Keio University, Japan and Deakin University, Australia



Projects

- More than 10 ongoing projects on AM, with value of projects more than 400lakhs.

Eligibility & Admission Procedure

- **MHRD Fellowship**: Candidates with valid GATE score in {AE, ME, MT, PI, BM, BT, CH, XL} and a BTech/BE in the relevant field. For IIT Undergraduates with a CGPA of 8.0 or above, GATE is not essential. Admission based on GATE Score of Candidates.
- **Self-Sponsored**: 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 program, GATE score is not mandatory. Admission will be based on Written Test and Interview.
- **Govt. Lab/ Public Sector Sponsored**: This is meant for candidates working in Government or Public sector institutes (including armed forces officials) with more than 2-year experience and having a basic BTech/BE degree in relevant field. GATE score is not mandatory in this category. Admission will be based on Written Test and Interview.
- For more information, please contact: Prof. G. D. Janaki Ram jram@msme.iith.ac.in
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