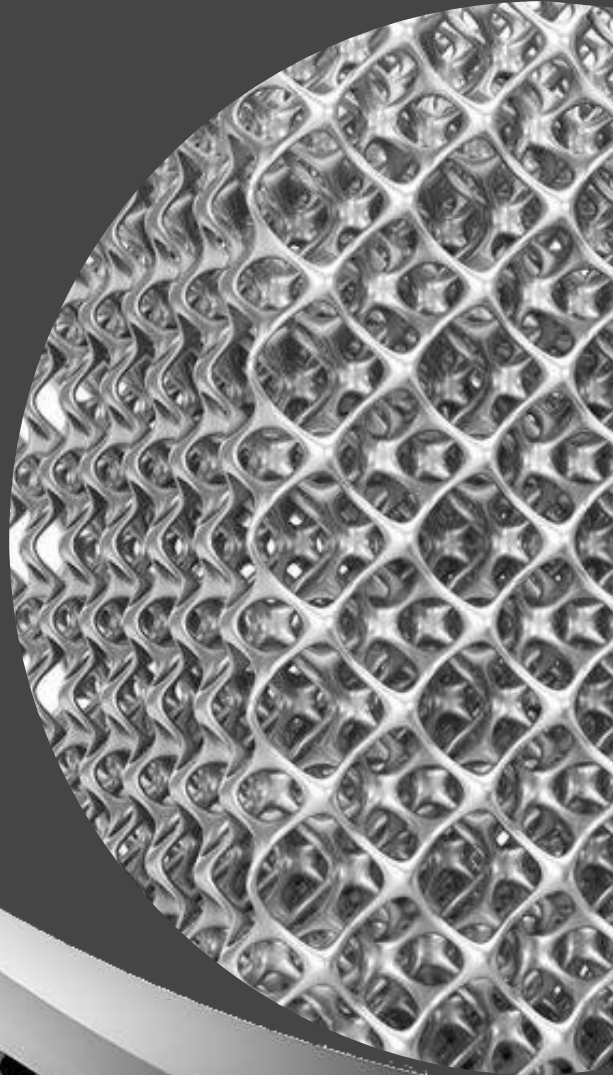




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भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Interdisciplinary M.Tech. in Lightweighting Engineering



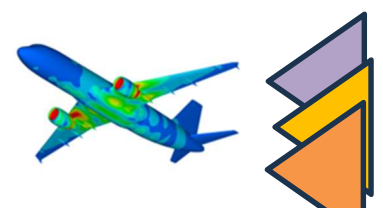
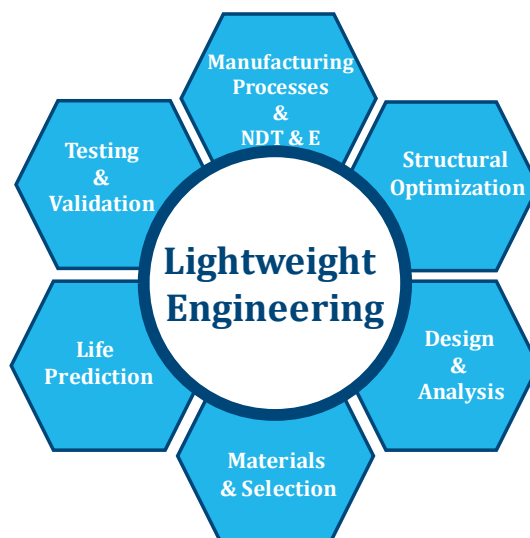


Background

➤ Objective:

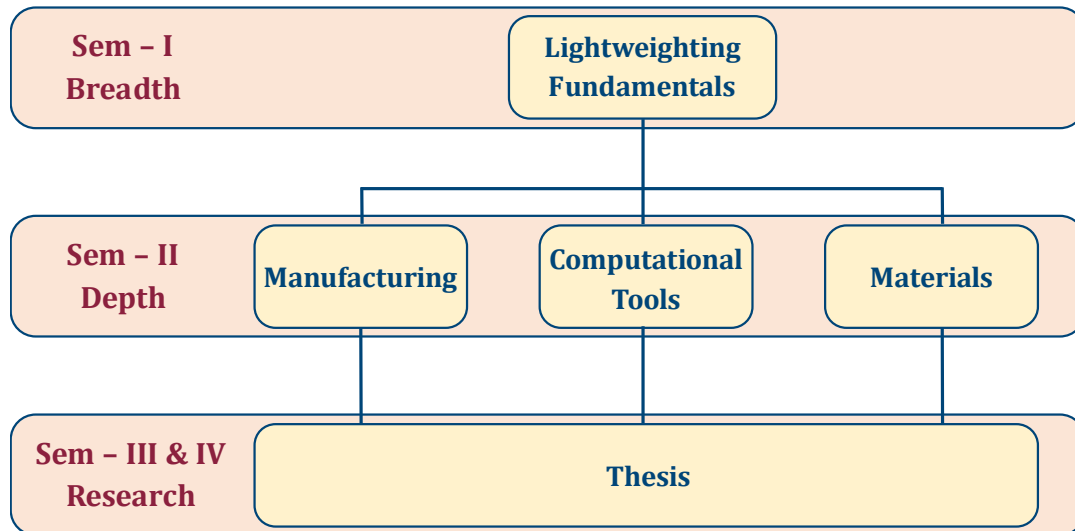
- ❖ The primary objective of this interdisciplinary MTech program is to develop a new generation of engineers and scientists with knowledge and skills in advanced technologies and trained in lightweight engineering design from conceptualization stage to realization.
- ❖ Program focuses on the design, analysis, and development of lightweight structures and materials while maintaining or improving mechanical performance, durability, safety.
- ❖ Develop proficiency in modern design and simulation tools used in the analysis and optimization of lightweight structures.
- ❖ Integrate knowledge from different engineering disciplines to solve complex problems related to lightweight design and manufacturing.
- ❖ Explore advanced manufacturing processes, including additive manufacturing, precision machining, and material processing techniques specific to lightweight engineering.
- ❖ Provide insights into the practical applications of lightweight engineering in various industries, including automotive, aerospace, civil infrastructure, and renewable energy.

➤ Key Disciplines/Area



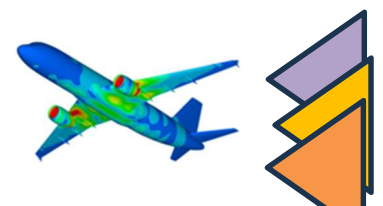


Course Outline



Course Structure

Course Title	Credits
Semester I	
Introduction to Lightweighting	2
Topology Optimization	3
Fundamentals of light weight alloys	3
Industry Lecture	1
Elective course(s) <i>(from elective basket)</i> *	4
Sub-total	13
Semester II	
Manufacturing Science for Lightweighting	2
English for Communications	1
Lab (Elective)	1
Elective courses <i>(from any one or more of the three elective baskets)**</i>	9
Sub-total	13
Semester III and IV	
Thesis	24
Total Credits	50





Course Structure

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

Basket	Course Title	Credits
Materials	Automotive Materials Part-I	2
	Fracture Fatigue and Creep	3

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

Basket	Course Title	Credits
Computation & Design	Design for Metal Additive Manufacturing	3
	Lightweighting Design Topics	3
	Analysis and Design of Composite Structures	3
	Introduction to Computational Methods in Materials Science	3
Manufacturing	Materials and processes for resource-efficient transport applications	2
	Tribological and surface engineering aspects of Lightweighting	3
	Clean Steel Making: Theory, Practice and Modeling	3
Materials	Automotive Materials Part-II	2
	Phase transformations	2

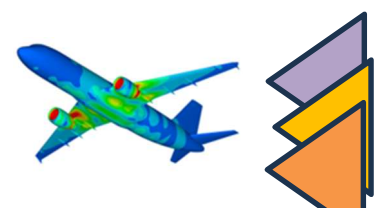
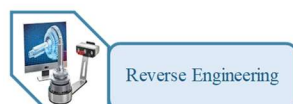
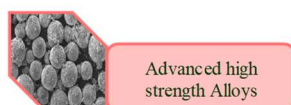
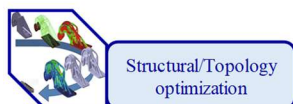
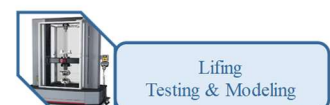
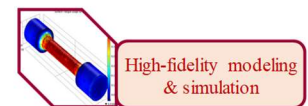
Glimpse of Research Facilities & Capabilities

Structural Design & Analysis

Manufacturing and NDT&E

Testing & Validation

Life Prediction & Extension





Eligibility & Admission Procedure

- ❖ **MoE candidates (TA):** Candidates having First Class BTech/BE in relevant field of Engineering and Technology with minimum CGPA of 7.0 or equivalent. Selection is based on GATE score. Eligible GATE papers: AE, ME, MT, MN, PI and XE. Selected candidates will be eligible for MoE fellowship.
- ❖ **Self-Sponsored candidates:** Candidates having First Class 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 &/or 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 First Class BTech/BE degree in relevant field. GATE score is not mandatory. NoC to be produced from industry or Govt. Organisations. Admission is based on Written Test &/or Interview.
- ❖ For more information, please contact:

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Dr. Mayur Vaidya, vaidyam@msme.iith.ac.in