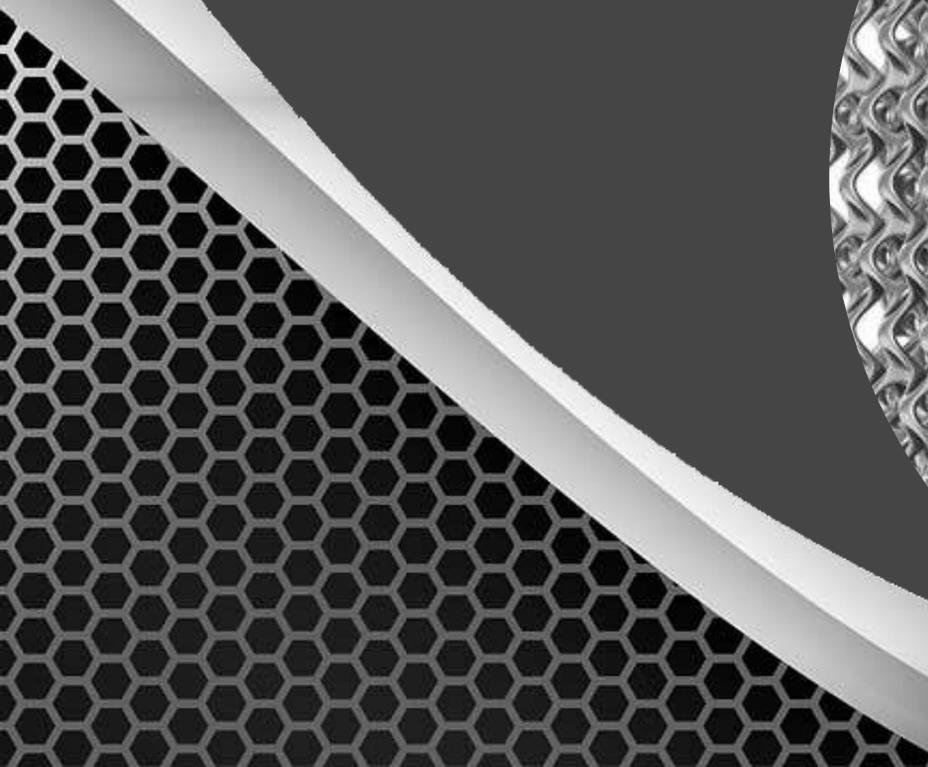
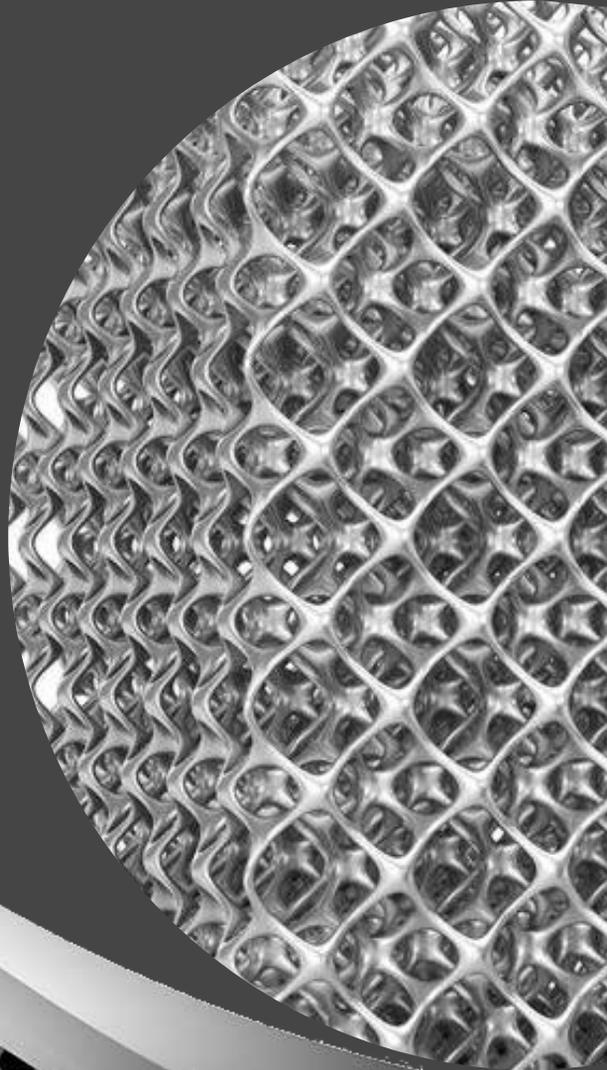




భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్  
भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad

# Interdisciplinary M.Tech. in Lightweighting Engineering



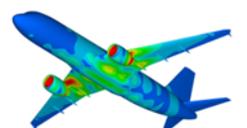
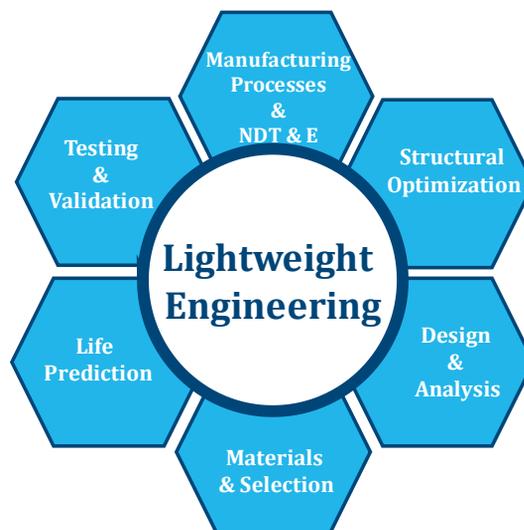


# Background

## ➤ Objective:

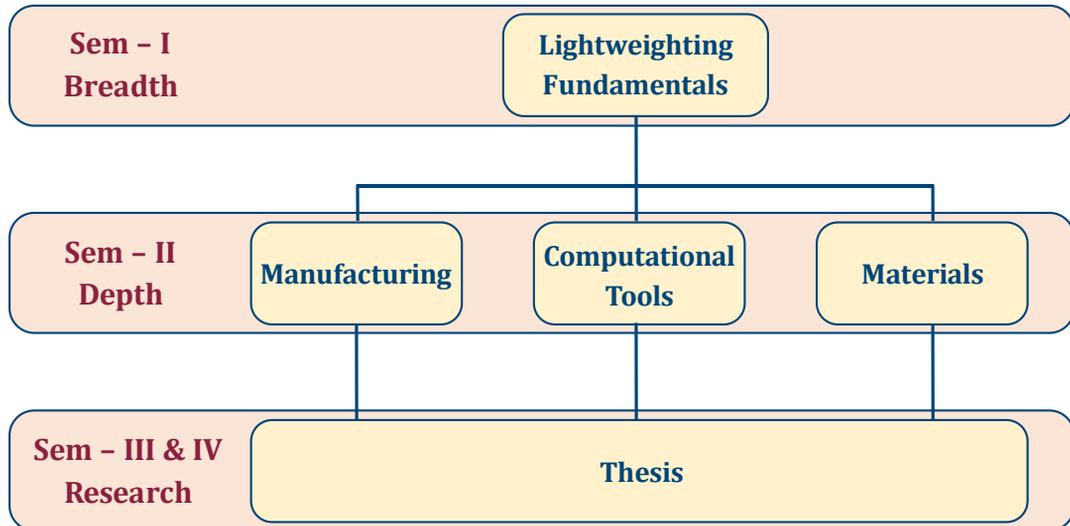
- ❖ The primary objective of this interdisciplinary MTech program is to develop a new generation of engineers and scientists with knowledge and skills in advanced technologies and trained in lightweight engineering design from conceptualization stage to realization.
- ❖ Program focuses on the design, 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



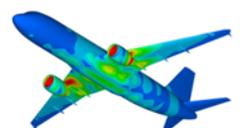


## Course Outline



## Course Structure

| Course Title   | Credits |
|--|---------|
| <b>Semester I</b>  |         |
| 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      |
| <b>Semester II</b>   |         |
| 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      |
| <b>Semester III and IV</b>   |         |
| 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       |

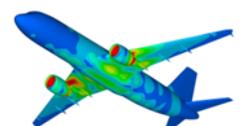
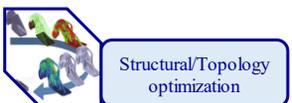
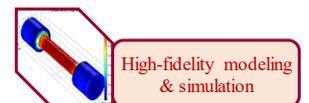
## Glimpse of Research Facilities & Capabilities

Structural Design & Analysis

Manufacturing and NDT&E

Testing & Validation

Life Prediction & Extension





# Eligibility & Admission Procedure

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- ❖ **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, PE 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:

Dr. Gopinath Muvvala, [mgopinath@mae.iith.ac.in](mailto:mgopinath@mae.iith.ac.in)

Dr. Mayur Vaidya, [vaidyam@msme.iith.ac.in](mailto:vaidyam@msme.iith.ac.in)