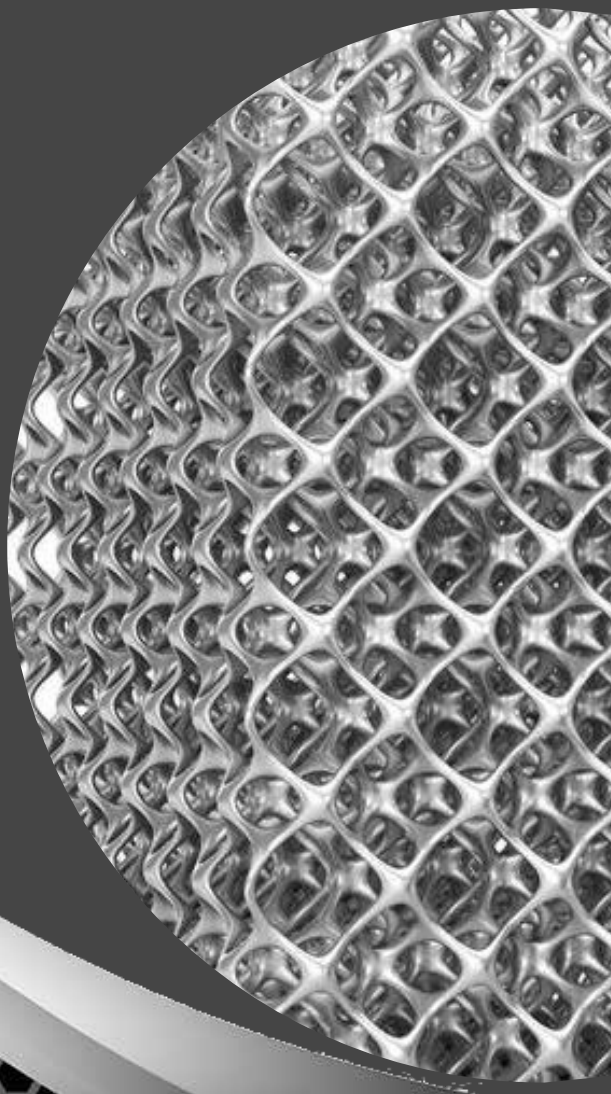
భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్

भारतीय प्रौद्योगिकी संस्थान हैदराबाद

Indian Institute of Technology Hyderabad

Interdisciplinary MTech in

Lightweighting Engineering



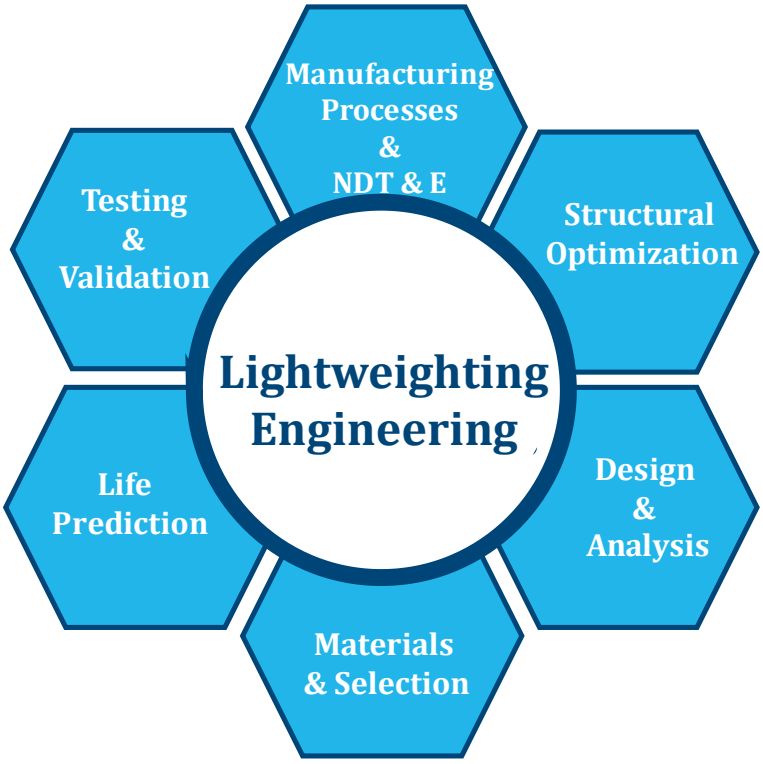
MTech in Lightweighting Engineering

Background

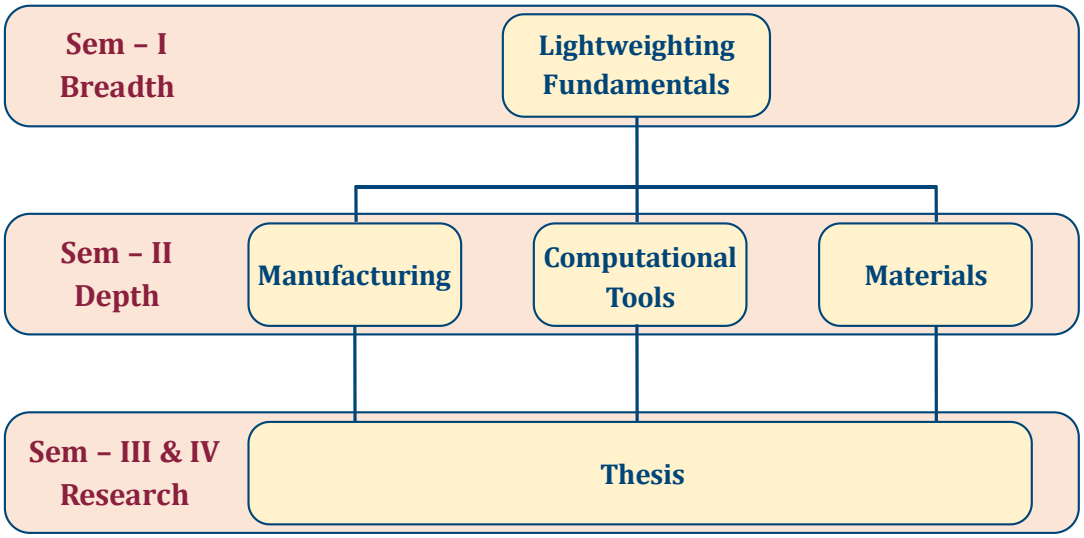
Objective:

- 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 lightweighting engineering 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, and 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 lightweighting engineering.
- Provide insights into the practical applications of lightweighting engineering in various industries, including automotive, aerospace, civil infrastructure, and renewable energy.

Key Disciplines/Area:



Course Outline



Course Structure

Course Title
Semester I
Introduction to Lightweighting
Topology Optimization
Fundamentals of light weight alloys
Industry Lecture
Elective course(s) *(from elective basket)* *
Semester II
Manufacturing Science for Lightweighting
English for Communications
Lab (Elective)
Elective courses *(from any one or more of the three elective baskets)***
Semester III and IV
Thesis

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

Basket	Course Title
Materials	Automotive Materials Part-I (Offered by university of Siegen)
	Fracture Fatigue and Creep

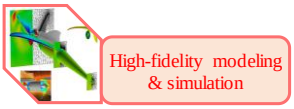
Course Structure

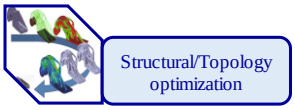
**Elective Courses in Semester II (the list is not exhaustive)

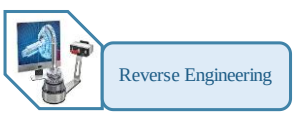
Basket	Course Title
Computation & Design	Design for Metal Additive Manufacturing
	Lightweighting Design Topics
	Analysis and Design of Composite Structures
	Introduction to Computational Methods in Materials Science
Manufacturing	Materials and processes for resource-efficient transport applications (Offered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

Glimpse of Research Facilities & Capabilities

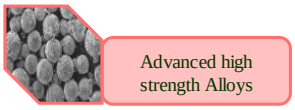
Structural Design & Analysis



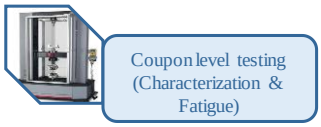


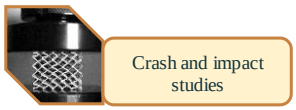


Manufacturing and NDT&E

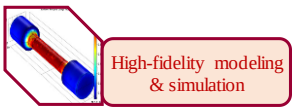


Testing & Validation





Life Prediction & Extension



Eligibility & Admission Procedure

- **MoE Fellowship:** Candidates having B.E./B.Tech. or equivalent in Metallurgy/ Ceramics/ Mechanical / Production / Industrial / Plastics / Polymer/ or related discipline or M.Sc. in Materials Science/Physics/Chemistry Valid GATE score required in MT/ME/PI/PH/CY/XE. Selection will be based on the GATE score.

- **Self-Sponsored candidates**: Candidates having BTech/BE in relevant field of Engineering and Technology with minimum CGPA of 7.0 or equivalent can apply. GATE score is not mandatory. This is a non-subsidized program, and no financial support is provided to the students. 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 years' experience and having a basic BTech/BE degree in relevant field can also apply. GATE score is not mandatory. Admission is based on Written Test &/or Interview. These candidates pay 50% of the tuition fee of self-sponsored candidates.

- For more information, please contact:

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