



Fibre reinforced

composites

SWAYAM Prabha Course Code – M05

PROFESSOR'S NAME	Prof. Chandra Sekher Yerramalli
DEPARTMENT	Aerospace Department
INSTITUTE	Indian Institute of Technology, Bombay
COURSE OUTLINE	Besides course outline, it should also indicate if there are any pre-requisites (i.e, prior knowledge) required .
	<p>The course is primarily focused on exploring the various analytical approaches for understanding the mechanics of fiber reinforced composites. However, given the unique nature of fiber composite materials, it will go through the basics of various materials utilized in making composites with a focus on fiber reinforced polymer matrix composites. It will also provide a brief introduction to the different manufacturing processes commonly used in the composite industry.</p> <p>The course will start with the basic shear lag model for understanding the fiber stress distribution in discontinuous fiber reinforced composites. Later, the course will introduce the micromechanics based approaches for estimating the effective properties of fiber reinforced composites. Once the lamina level homogenized property estimation methods are understood the student will be introduced to the concept of lamina and laminate and a laminate level constitutive relation would be developed utilizing the classical lamination theory (CLT). The results from the CLT model would be explored for different laminate configurations. Utilizing the CLT model, Failure theories like Tsai-Wu; anisotropic plate equations are developed and plate problems under various standard boundary conditions would be solved. Towards the middle of the semester, students would be asked to pursue a project based on the topic determined by the instructor. The project would help</p>

	the student to utilize some of the modeling approaches learnt during the course.
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COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic
1	L1	Development of Materials
2	L2	Composite Materials
3	L3	Manufacturing Processes
4	L4	Material arrangement
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References if

Any: