



UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE:	SEMESTER:			
MECHANICAL	6TH Sem	NAME OF THE TEACHING FACULTY: Er. AUROBINDANAYAK		
SUBJECT:	No of Days/Per week class allotted: 5 Class P/W(75)	Semester From Date: 16/01/2024		
COMPOSITE MATERIALS (ELECTIVE)		To Date: 26/04/2024		
)		No. Of Weeks: 15		
WEEK	CLASS DAY	THEORY TOPICS	REMARKS	
1 st	1 st	Classifications of Engineering Materials, Concept of composite materials.	Date	Dean/Principal
	2 nd	Classifications of Engineering Materials, Concept of composite materials.		
	3 rd	Classifications of Engineering Materials, Concept of composite materials.		
	4 th	Matrix materials, Functions of a Matrix, Desired Properties of a Matrix, Polymer Matrix (Thermosets and Thermoplastics), Metal matrix, Ceramic matrix, Carbon Matrix, Glass Matrix etc.		
2 nd	1 st	Matrix materials, Functions of a Matrix, Desired Properties of a Matrix, Polymer Matrix (Thermosets and Thermoplastics), Metal matrix, Ceramic matrix, Carbon Matrix, Glass Matrix etc.		
	2 nd	Matrix materials, Functions of a Matrix, Desired Properties of a Matrix, Polymer Matrix (Thermosets and Thermoplastics), Metal matrix, Ceramic matrix, Carbon Matrix, Glass Matrix etc.		
	3 rd	Types of Reinforcements/Fibers: Role and Selection of reinforcement materials.		
	4 th	Types of Reinforcements/Fibers: Role and Selection of reinforcement materials.		
	1 st	Types of Reinforcements/Fibers: Role and Selection of reinforcement materials.		

3 rd	2 nd	Types of fibers, Glass fibers, Carbon fibers, Aramid fibers, Metal fibers, Alumina fibers, Boron Fibers, Silicon carbide fibers, Quartz and Silica fibers, Multiphase fibers, Whiskers, Flakes etc.,		
	3 rd	Types of fibers, Glass fibers, Carbon fibers, Aramid fibers, Metal fibers, Alumina fibers, Boron Fibers, Silicon carbide fibers, Quartz and Silica fibers, Multiphase fibers, Whiskers, Flakes etc.,		
	4 th	Types of fibers, Glass fibers, Carbon fibers, Aramid fibers, Metal fibers, Alumina fibers, Boron Fibers, Silicon carbide fibers, Quartz and Silica fibers, Multiphase fibers, Whiskers, Flakes etc.,		
4 th	1 st	Mechanical properties of fibers.		
	2 nd	Mechanical properties of fibers.		
	3 rd	Mechanical properties of fibers.		
	4 th	2.1 Classification based on Matrix Material: Organic Matrix composites, Polymer matrix composites (PMC), Carbon matrix Composites or Carbon-Carbon Composites, Metal matrix composites (MMC), Ceramic matrix composites (CMC)		
5 th	1 st	2.1 Classification based on Matrix Material: Organic Matrix composites, Polymer matrix composites (PMC), Carbon matrix Composites or Carbon-Carbon Composites, Metal matrix composites (MMC), Ceramic matrix composites (CMC)		
	2 nd	Classification based on reinforcements: Fiber Reinforced Composites, Fiber Reinforced Polymer (FRP) Composites, Laminar Composites, Particulate Composites.		
	3 rd	Classification based on reinforcements: Fiber Reinforced Composites, Fiber Reinforced Polymer (FRP) Composites, Laminar Composites, Particulate Composites.		
	4 th	Classification based on reinforcements: Fiber Reinforced Composites, Fiber Reinforced Polymer (FRP) Composites, Laminar Composites, Particulate Composites.		
	1 st	Comparison with Metals, Advantages & limitations of Composites.		

6 th	2 nd	ComparisonwithMetals, Advantages&limitationsofCompo sites.		
	3 rd	ComparisonwithMetals, Advantages&limitationsofCompo sites.		
	4 th	Geometricalaspects–volume andweight fraction.		
7 th	1 st	Geometricalaspects–volume andweight fraction.		
	2 nd	Geometricalaspects–volume andweight fraction.		
	3 rd	Geometricalaspects–volume andweight fraction.		
	4 th	Unidirectionalcontinuousfiber,discontinuousfibers,Shortfibersystems,wovenreinforcements– Mechanical Testing		
8 th	1 st	Unidirectionalcontinuousfiber,discontinuousfibers,Shortfibersystems,wovenreinforcements– Mechanical Testing		
	2 nd	Unidirectionalcontinuousfiber,discontinuousfibers,Shortfibersystems,wovenreinforcements– Mechanical Testing		
	3 rd	Unidirectionalcontinuousfiber,discontinuousfibers,Shortfibersystems,wovenreinforcements– Mechanical Testing		
	4 th	Determination of stiffness andstrengths of unidirectionalcomposites;tension,compression,flexureandshear.		
9 th	1 st	Determination of stiffness andstrengths of unidirectionalcomposites;tension,compression,flexureandshear.		
	2 nd	Determination of stiffness andstrengths of unidirectionalcomposites;tension,compression,flexureandshear.		
	3 rd	Determination of stiffness andstrengths of unidirectionalcomposites;tension,compression,flexureandshear.		
	4 th	Geometricalaspects–volume andweight fraction		
10 th	1 st	Geometricalaspects–volume andweight fraction		
	2 nd	Geometricalaspects–volume andweight fraction		
	3 rd	Geometricalaspects–volume andweight fraction		
	4 th	Unidirectionalcontinuousfiber,discontinuousfibers,Shortfibersystems,wovenreinforcements– Mechanical Testing.		

11 th	1 st	Unidirectional continuous fiber, discontinuous fibers, Short fiber systems, woven reinforcements – Mechanical Testing.		
	2 nd	Unidirectional continuous fiber, discontinuous fibers, Short fiber systems, woven reinforcements – Mechanical Testing.		
	3 rd	Unidirectional continuous fiber, discontinuous fibers, Short fiber systems, woven reinforcements – Mechanical Testing.		
	4 th	Determination of stiffness and strengths of unidirectional composites; tension, compression, flexure and shear.		
12 th	1 st	Determination of stiffness and strengths of unidirectional composites; tension, compression, flexure and shear.		
	2 nd	Determination of stiffness and strengths of unidirectional composites; tension, compression, flexure and shear.		
	3 rd	Determination of stiffness and strengths of unidirectional composites; tension, compression, flexure and shear.		
	4 th	Plate Stiffness and Compliance, Assumptions, Strains, Stress Resultants, Computation of Stresses. 4		
13 th	1 st	Plate Stiffness and Compliance, Assumptions, Strains, Stress Resultants, Computation of Stresses. 4		
	2 nd	Types of Laminates - Symmetric Laminates, Antisymmetric Laminate, Balanced Laminate, Quasi-isotropic Laminates, Cross-ply Laminate, Angle ply Laminate. Orthotropic Laminate.		
	3 rd	Types of Laminates - Symmetric Laminates, Antisymmetric Laminate, Balanced Laminate, Quasi-isotropic Laminates, Cross-ply Laminate, Angle ply Laminate. Orthotropic Laminate.		
	4 th	Types of Laminates - Symmetric Laminates, Antisymmetric Laminate, Balanced Laminate, Quasi-isotropic Laminates, Cross-ply Laminate, Angle ply Laminate. Orthotropic Laminate.		

14 th	1 st	LaminateModuli,Hydrothermal Stresses.		
	2 nd	LaminateModuli,Hydrothermal Stresses.		
	3 rd	Joining –Advantages anddisadvantagesofadhesiveand mechanically fastened joints.		
	4 th	Joining –Advantages anddisadvantagesofadhesiveand mechanically fastened joints.		
15 th	1 st	Joining –Advantages anddisadvantagesofadhesiveand mechanically fastened joints.		
	2 nd	Typicalbondstrengthsandtest procedures		
	3 rd	Typicalbondstrengthsandtest procedures		
	4 th	Typicalbondstrengthsandtest procedures		

Opheos's Das

HOD

Chittaranjan Parida

DEAN

(Signature)

PRINCIPAL