



## G.Pullaiah College of Engineering and Technology

(Autonomous)

(Approved by AICTE, New Delhi | NAAC Accreditation with 'A' Grade |

Accredited by NBA (CSE, ECE & EEE) | Affiliated to JNTUA)

Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

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DATE: 10-03-2022

To

The Principal,  
GPCET,  
Kurnool.

Sir,

Sub: Approval of ADD-ON course for II ME, III ME & IV ME Students-Regd

The department of ME requests you to accept the proposal for conducting ADD-ON Course on “**Mechanics of Fiber Reinforced polymer composite structure.**” for the odd semester of II, III & IV year ME students scheduled for the duration of 42 hours. Kindly accept the proposal.

Thanking you sir,

Yours Sincerely

HOD-ME

G.Pullaiah College of Engg & Tech.  
Nandikotkur Road, VENKAYAPALLI  
KURNOOL-518 452 (A.P)



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### Department Circular –ADD-ON Course

DATE: 11-03-2022

The II year, III year & IV year-II semester ME Students are informed to enroll their names for ADD-ON Course on “**Mechanics of Fiber Reinforced polymer composite structure.**” with their respective class-in-charges on or before 13-03-2022. The course commences from 14<sup>th</sup> March and the duration of the course is for 42 hours. The course is conducted from 4 pm to 5 pm regularly.

Bus facility is made available soon after the class work.

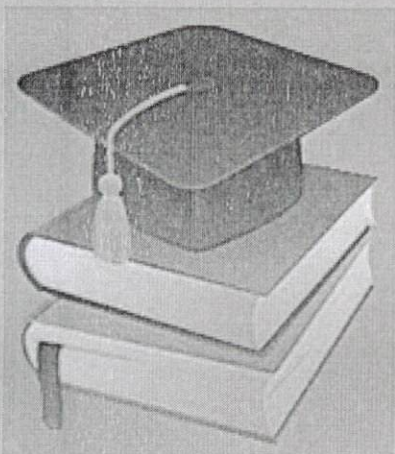
HOD-ME



**G. PULLAIAH COLLEGE OF  
ENGINEERING AND TECHNOLOGY  
(AUTONOMOUS)**

**Department Of Mechanical Engineering**

**ADD ON COURSE**



**Topic : Mechanics of Fiber Reinforced  
polymer composite structure.**

**Target audience : II and III Year Students**

**Total Courses Duration : 42 hrs**

**Selection Procedure : Registration on First  
come First serve basis**

**FREE**

**Register  
Now**

**Date of commencement of the course : 14 Mar , 2022.**

**End of Course : 02 June, 2022.**

**Exam Date: 04 June,2022.**

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**SYLLABUS FOR ADD-ON COURSE ON MECHANICS OF FIBER REINFORCED  
POLYMER COMPOSITE STRUCTURE.**

<b>DAY</b>	<b>TOPICS</b>
1	Introduction to FRP Composites
2	Review of Elasticity
3	Macromechanics of Lamina - I
4	Macromechanics of Lamina - II
5	Micromechanics of Lamina - I
6	Macromechanics of Lamina - II
7	Elastic Behaviour of Laminates - I
8	Elastic Behaviour of Laminates - II
9	Failure Analysis of Laminates
10	Design Examples
11	Interlaminar Stresses
12	Transverse Deflection
13	Buckling and Free vibration of Laminated Plates
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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY: KURNOOL (Autonomous)

Department of Mechanical Engineering

The following is the list of the students who have registered Add on Course on “Cryogenic Hydrogen Technology”

S.No	ROLL NO	Name of the Candidate
1	19AT1A0301	SYED ABBAS
2	19AT1A0302	K. ABHI RAM MANIKANTA YADHAV
3	19AT1A0303	SHAIK AFROZ BASHA
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**G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOG**  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
**ADDON COURSE SCHEDULE**

**Date: 14/03/2022**

II&III YEAR – II Semester		
Course	Faculty	Duration
Introduction to FRP Composites	DR. K.MALLIKARJUNA	3 hours
Review of Elasticity	DR. K.MALLIKARJUNA	3 hours
Macromechanics of Lamina - I	DR. K.MALLIKARJUNA	2 hours
Macromechanics of Lamina - II	DR.S.VENKATESHWALU	3 hours
Micromechanics of Lamina - I	DR.S.VENKATESHWALU	3 hours
Macromechanics of Lamina - II	DR.S.VENKATESHWALU	3 hours
Elastic Behaviour of Laminates - I	DR.S.VENKATESHWALU	2 hours
Elastic Behaviour of Laminates - II	S. JAVEED	3 hours
Failure Analysis of Laminates	S. JAVEED	3 hours
Design Examples	S. JAVEED	3 hours
Interlaminar Stresses	A.SRINIVAS	2 hours
Transverse Deflection	A.SRINIVAS	2 hours
Buckling and Free vibration of Laminated Plates	M.Nagaraju	2 hours

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**G. PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)**

**II, III & IV B. Tech I SEM Objective Paper – Assessment**

**Branch: MECHANICAL ENGINEERING**

Sub: Mechanics of Fiber Reinforced Polymer Composite Structures

Date: 04/06/2022

Time: 30 min

Max.Marks:25

Roll No:

Invigilator signature:

**I.MULTIPLE CHOICE QUESTIONS**

1. What is the primary purpose of fiber reinforcement in composite materials? [     ]
- a) Increase thermal conductivity    b) Enhance electrical insulation  
c) Improve mechanical properties    d) Decrease material density
2. Which type of fibers are commonly used in fiber reinforced composites? [     ]
- a) Steel fibers    b) Glass fibers    c) Aluminum fibers    d) Copper fibers
3. What is the role of the matrix material in fiber reinforced composites? [     ]
- a) Provide structural rigidity    b) Protect the fibers from environmental damage  
c) Enhance electrical conductivity    d) Transfer load to the fibers
4. Which of the following is a common manufacturing process for fiber reinforced composites? [     ]
- a) Injection molding    b) Extrusion    c) Pultrusion    d) Casting
5. What is the primary advantage of using continuous fibers in composite materials? [     ]
- a) Lower production cost    b) Higher strength and stiffness  
c) Improved impact resistance    d) Enhanced thermal conductivity
6. Which mechanical property is typically improved by adding fibers to a composite material? [     ]
- a) Brittleness    b) Ductility    c) Toughness    d) Elasticity
7. What is the significance of the aspect ratio of fibers in fiber reinforced composites? [     ]
- a) It determines the color of the composite material  
b) It affects the electrical conductivity of the composite  
c) It influences the mechanical properties of the composite  
d) It has no impact on the performance of the composite

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8. Which of the following factors affects the strength of fiber reinforced composites? [ ]
- a) Fiber type and orientation b) Matrix material c) Manufacturing process  
d) All of the above
9. Which type of failure mechanism is common in fiber reinforced composites? [ ]
- a) Shear failure b) Tensile failure c) Ductile failure d) Creep failure
10. What is the primary advantage of using short fibers in composite materials? [ ]
- a) Higher stiffness b) Easier processing  
c) Improved fatigue resistance d) Enhanced electrical conductivity
11. What is the role of interfacial bonding in fiber reinforced composites? [ ]
- a) Increase matrix viscosity b) Decrease composite density  
c) Enhance load transfer between fibers and matrix d) Improve thermal conductivity
12. Which type of fibers offer high strength and stiffness but are also relatively expensive? [ ]
- a) Glass fibers b) Carbon fibers c) Aramid fibers d) Polyester fibers
13. Which of the following factors influences the fatigue behavior of fiber reinforced composites? [ ]
- a) Fiber type b) Manufacturing process c) Load frequency d) Matrix density
14. What is the primary disadvantage of using natural fibers in composite materials? [ ]
- a) High cost b) Limited availability  
c) Low strength and stiffness d) Poor environmental performance
15. Which type of loading is typically best resisted by fiber reinforced composites? [ ]
- a) Compressive loading b) Torsional loading c) Shear loading d) Tensile loading
16. Which type of matrix material is commonly used in high-temperature applications for fiber reinforced composites? [ ]
- a) Epoxy b) Polyester c) Phenolic d) Polyethylene
17. What is the primary advantage of using polymer matrix composites? [ ]
- a) Low cost b) High temperature resistance  
c) Low density d) Excellent electrical conductivity

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18. Which of the following is a common failure mode in fiber reinforced composites? [     ]
- a) Yielding   b) Creep   c) Fatigue   d) All of the above
19. What is the significance of fiber orientation in fiber reinforced composites? [     ]
- a) It affects the aesthetics of the composite  
b) It determines the manufacturing process  
c) It influences the mechanical properties of the composite  
d) It has no impact on the performance of the composite
20. Which of the following is a common application of fiber reinforced composites? [     ]
- a) Textile manufacturing   b) Building insulation  
c) Aerospace structures   d) Food packaging
21. What is the primary advantage of using ceramic matrix composites? [     ]
- a) High strength-to-weight ratio   b) Low cost   c) Flexibility   d) Corrosion resistance
22. Which of the following is NOT a common type of reinforcement used in fiber reinforced composites? [     ]
- a) Carbon   b) Glass   c) Steel   d) Kevlar
23. What is the primary disadvantage of using metal matrix composites? [     ]
- a) Low strength   b) High cost   c) Low density   d) Poor thermal conductivity
24. What is the significance of fiber volume fraction in fiber reinforced composites? [     ]
- a) It determines the density of the composite  
b) It affects the electrical conductivity of the composite  
c) It influences the mechanical properties of the composite  
d) It has no impact on the performance of the composite
25. Which of the following factors affects the toughness of fiber reinforced composites? [     ]
- a) Fiber type and orientation   b) Matrix material   c) Manufacturing process  
d) All of the above

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**G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY: KURNOOL (Autonomous)**  
**Department of Mechanical Engineering**  
Evaluation sheet on Add on Course on “Mechanics of Fiber Reinforced polymer composite structure.”

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