

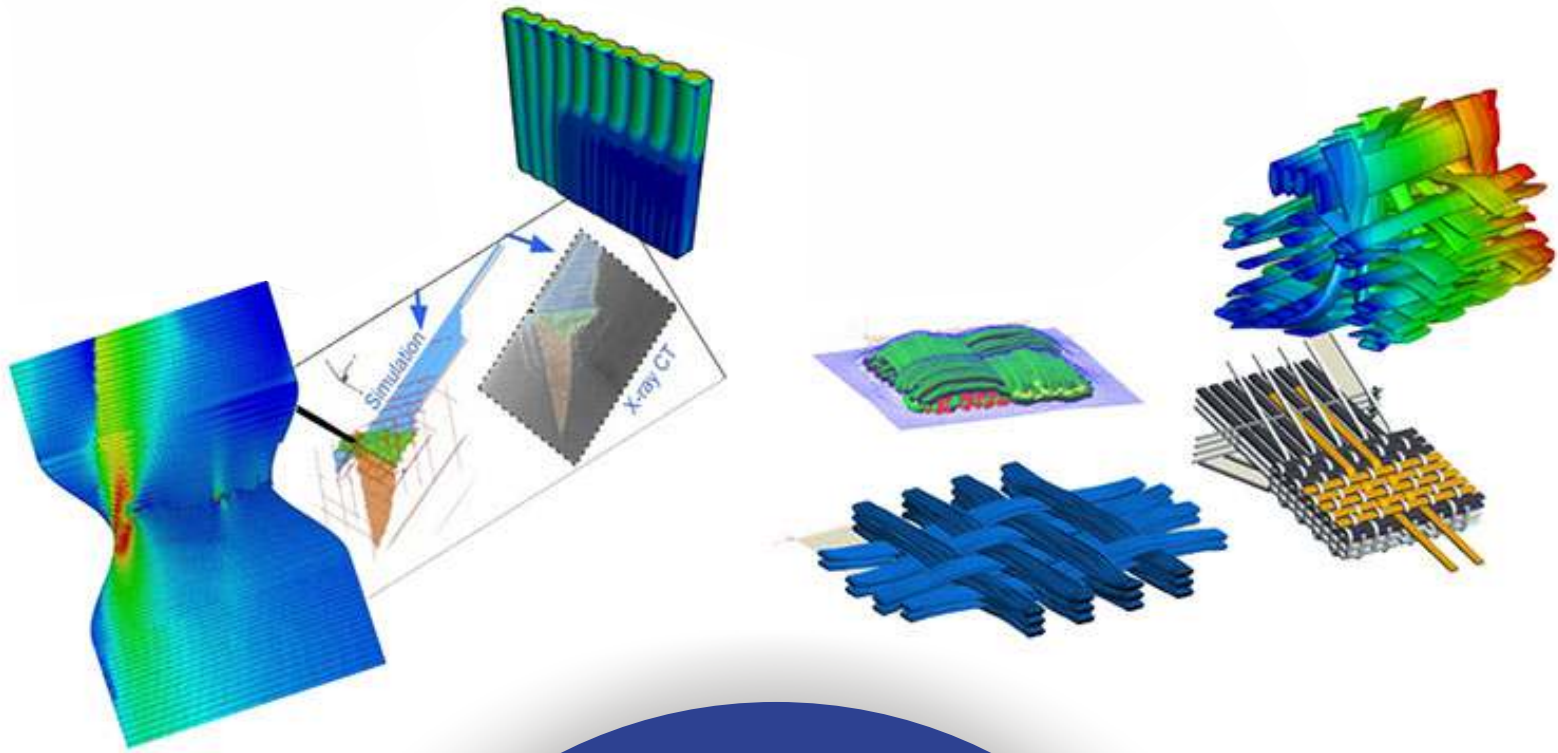


SHARDA
UNIVERSITY
Beyond Boundaries



**SHARDA SCHOOL OF
ENGINEERING &
TECHNOLOGY**

Department of Mechanical Engineering



COURSE

**Fabrication, testing and
simulation of
composites design
(VAC-504)**

VALUE ADDED
COURSE BROCHURE-30 HRS
2023-24

ABOUT THE UNIVERSITY

Sharda University envisions to serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship. It has 13,000+ students from 95+ countries, 29 states, and Union Territories, providing cultural diversity and global exposure to students. It has 26000+ alumni who are today leaders in their realms. Sharda University is **NAAC A+** University with Overall **NIRF Rank of 87**. Teaching Learning Center at Sharda University is to equip the faculty members with the expertise, skills and knowledge they need for capacity building of students. Teaching as a profession requires highly specialized skills and knowledge to impact significantly on student learning and therefore teachers must refine their conceptual and pedagogical skills.

ABOUT SCHOOL

Sharda School of Engineering and technology is an open platform for diverse voices where teaching runs parallel to the real world and students are groomed to join the global workforce. SSET is distinguished as one of the top-ranked engineering schools in India. The students at SSET benefit through the professional grooming of renowned faculty and industry experts having experience of tackling pressing engineering problems. Students discover their passion in one of the various offered Engineering majors at the School of Engineering and technology.

ABOUT DEPARTMENT

The department of mechanical engineering is one of the broadest and oldest in the Sharda School of Engineering and Technology, which is constantly evolving with advancements in technology, especially in Automotive Electrical Vehicles, Mechatronics, and Digital Manufacturing. The department offers B. Tech Mechanical Engineering and M. Tech Mechanical Engineering. In addition to theoretical coursework, mechanical engineering students also have access to well-equipped laboratories such as the Mechanical Simulation Laboratory, Computer-Aided Design and Drafting, Mechanical Workshop, Manufacturing Technology Laboratory, Mechanics of Machines and Solids Laboratory, Fluid Mechanics and Turbo Machinery Laboratory, Heat Transfer and RAC Laboratory, IC Engines, Automobile Engineering, and Mechatronics Engineering Laboratory, where they can gain hands-on experience in testing and evaluating mechanical systems. These laboratories include facilities for design simulation, materials testing, thermal testing, fluid mechanics, advance machining processes, automobile engineering and control systems.

VALUE ADDED COURSE (VAC)

The Value added Education Courses aim to provide additional learner centric graded skill oriented training, with the primary objective of improving the employability skills of students.

PURPOSE OF VALUE ADDED COURSE

VACs are pertinent instructional strategies designed to close knowledge gaps in students and provide them a competitive edge in the Job market. The courses' well-defined offspring VACs make them incredibly helpful for enhancing Students' employability quotient by developing a variety of competencies. It aids pupils in laying the creative groundwork for a passion project. (Computers project, quantitative analytics, etc) aside from their occupation courses offering characteristics that can assist in transforming their enthusiasm into occupation. Students can understand basic concepts and terminology of cloud technologies in the current IT environment. Students can classify and analyze the terms of virtualization and its types along with services, types, and challenges with cloud applications.

COURSE DESCRIPTION

This course provides a comprehensive exploration of the entire lifecycle of composite materials in engineering applications. The course begins with an introduction to composite materials, covering their composition, manufacturing processes, and various types. Subsequently, participants will delve into the practical aspects of fabrication, gaining hands-on experience in creating composite structures through different techniques.

RESOURCE PERSON

Dr. Paul Praveen A

Dr. Paul Praveen A is an Associate Professor of Mechanical Engineering (Design) in the School of Engineering and Technology, Sharda University, India. He holds a full time Ph.D. from Vellore Institute of Technology (VIT), specializing in Honeycomb Composite Sandwich Structural Dynamics. He earned his M.Tech. in Mechanical (Design Engineering) from Karunya University, Coimbatore, and B.E. in Mechanical Engineering from Sri Krishna College of Engineering affiliated to Anna University, Chennai. He has seven years of experience in teaching and research. Apart from his academic and research endeavors, he actively participates in program and institutional accreditation activities, primarily focused on research and outcome-based education. Experience: 5+ years

COURSE SCHEDULE

Unit	Content	Duration
1	Composites Modelling and its types, Feature based modelling technique.	2 h
2	Laminated and sandwich composites designing.	2 h
3	Honeycomb and foamed structured designing.	2 h
4	Basics hand lay-up technique.	2 h
5	Advance hydraulic press technique.	2 h
6	Fabrication of laminated and honeycomb cored sandwich composites.	2 h
7	ANSYS –ACP basics, Sketching geometry.	2 h
8	Advance tools and editing tools.	2 h
9	Using ACP-post and pre-processing.	2 h
10	DIGIMAT-MSC Basic part modelling.	2 h
11	Feature modelling Extrusion, RVE model etc.	2 h
12	Creating some advance features like boundary conditions and orientation of inclusions of filler materials.	2 h
13	Basic of UTM machine testing.	2 h
14	Perform the Tensile, bending and compression, etc.	2 h
15	Analysis the data and verified experimental with numerical results.	2 h
Total		30 h

School: SSET
Program: B.Tech
Branch: ALL

Batch: 2023-24
Current Academic Year: 2023-24
Semester: II

1. Course Code	VAT 504	
2. Course Title	Fabrication, testing and simulation of composites design	
3. Credits	0	
4. Contact Hours (L-T-P)	30 Hours	
Course Type	Value added course	
5. Course Objective	<ul style="list-style-type: none"> This course aims to provide students with a comprehensive understanding of the fabrication, testing, and simulation processes involved in the design of composite materials. Participants will gain practical knowledge and skills necessary for working with composites, including the ability to fabricate composite structures, conduct various testing methods, and use simulation tools for optimizing design performance. 	
6. Course Outcomes	<p>The student will be able to</p> <p>CO1: Understand basic introduction of composites design. CO2: Design of different composites structure. CO3: Fabricate of composites structure. CO4: Test of elastic properties of composites. CO5: Model and simulate the mechanical behaviour of composites. CO6: Analyse an engineering design and use the software packages for simulation modelling, fabrication and testing.</p>	
7. Course Description	<p>This course provides a comprehensive exploration of the entire lifecycle of composite materials in engineering applications. The course begins with an introduction to composite materials, covering their composition, manufacturing processes, and various types. Subsequently, participants will delve into the practical aspects of fabrication, gaining hands-on experience in creating composite structures through different techniques.</p>	
8. Outline syllabus		CO Mapping
Unit 1	Introduction of composite design	
A	Composites Modelling and its types, Feature based modelling technique.	CO1
B	Laminated and sandwich composites designing	CO1
C	Honeycomb and foamed structured designing	CO1
Unit 2	Working with Fabrication	
A	Basics hand lay-up technique.	CO2
B	Advance hydraulic press technique.	CO2
C	Fabrication of laminated and honeycomb cored sandwich composites	CO2
Unit 3	Working with ANSYS Interface	
A	ANSYS –ACP basics, Sketching geometry.	CO3
B	Advance tools and editing tools.	CO3
C	Using ACP-post and pre-processing	CO3
Unit 4	Working with Digimat-MSI Interface	
A	DIGIMAT-MSI Basic part modelling	CO4
B	Feature modelling Extrusion, RVE model etc.	CO4
C	Creating some advance features like boundary conditions and orientation of inclusions of filler materials.	CO4
Unit 5	Testing the composites	
A	Basic of UTM machine testing.	CO5
B	Perform the Tensile, bending and compression, etc.	CO5
C	Analysis the data and verified experimental with numerical results	CO6
Mode of examination	Assignment/Practical/Viva	