

SHRI VENKATESHWARA UNIVERSITY



Syllabus

M.TECH
Mechanical Engineering
IIIrd SEMESTER
(Two Years Post Graduation Programme)

(w.e.f. 2019-20)

SCHOOL OF ENGINEERING & TECHNOLOGY

Mechanical Engineering

SEMESTER-III

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	MME-051	Holonic Manufacturing Systems	3	0	0	20	10	30		70		100	3
2	MOE-335	Composite Materials	3	0	0	20	10	30		70		100	3
3	MME-321	Dissertation Phase – I	0	0	20				125		125	250	10
		Total										450	16

Course:- M.Tech
Subject:- Holonic Manufacturing Systems
Max. Marks: a) Internal/Practical- 30
b) External- 70

Year/Semester:- II/III
Subject Code:- MME-051

Credit Hours		
L	T	P
3	0	0

Course outcomes: At the end of the course, students will be able to

1. Find out losses in the prestressed concrete. Understand the basic aspects of prestressed concrete fundamentals, including pre and post-tensioning processes.
2. Analyse prestressed concrete deck slab and beam/ girders.
3. Design prestressed concrete deck slab and beam/ girders.
4. Design of end blocks for prestressed members.

Syllabus Contents:

Business requirements analysis, Batch Manufacturing and Mass customization, Hierarchical control limitations, Emergence of heterarchical and Agent based Systems: Scope and limitations. Holonic Control:

Definition of holon, holarchy, HMS, Holonic Behavior: Autonomy, Cooperation, Reconfiguration, plug and play, Comparison between Bionic, fractal and holonic behavior. Generic Holonic model: PROSA structure, MAS vs Holonic manufacturing, Distributed Problem Solving (DPS), Unified Modeling

Language (UML) [Class diagram], MCDM techniques in Holonic manufacturing, Contract Net Protocol,

Ant algorithm, Holonic Scheduling, Adacor, Holonic control implementation & case Study.

Reference Books:

Course:- M.Tech

Subject:- Dissertation I

Max. Marks: a) Internal/Practical- 125

b) External- 125

Year/Semester:- II/III

Subject Code:- MME-321

Credit Hours		
L	T	P
0	0	20

Course Outcomes: At the end of the course, the student will be able to:

- Identify structural engineering problems reviewing available literature.
- Identify appropriate techniques to analyze complex structural systems.
- Apply engineering and management principles through efficient handling of project

Syllabus Contents:

Dissertation-I will have mid semester presentation and end semester presentation. Mid semester presentation will include identification of the problem based on the literature review on the topic referring to latest literature available.

End semester presentation should be done along with the report on identification of topic for the work and the methodology adopted involving scientific research, collection and analysis of data, determining solutions and must bring out individuals contribution.

Continuous assessment of Dissertation – I and Dissertation – II at Mid Sem and End Sem will be monitored by the departmental committee.

Course:- M.Tech
Subject:- Composite Materials
Max. Marks: a) Internal/Practical- 30
b) External- 70

Year/Semester:- II/III
Subject Code:- MOE-335

Credit Hours		
L	T	P
3	0	0

UNIT-I: INTRODUCTION: Definition – Classification and characteristics of Composite materials. Advantages and application of composites. Functional requirements of reinforcement and matrix. Effect of reinforcement (size, shape, distribution, volume fraction) on overall composite performance.

UNIT – II: REINFORCEMENTS: Preparation-layup, curing, properties and applications of glass fibers, carbon fibers, Kevlar fibers and Boron fibers. Properties and applications of whiskers, particle reinforcements. Mechanical Behavior of composites: Rule of mixtures, Inverse rule of mixtures. Isostrain and Isostress conditions.

UNIT – III: Manufacturing of Metal Matrix Composites: Casting – Solid State diffusion technique, Cladding – Hot isostatic pressing. Properties and applications. Manufacturing of Ceramic Matrix Composites: Liquid Metal Infiltration – Liquid phase sintering. Manufacturing of Carbon – Carbon composites: Knitting, Braiding, Weaving. Properties and applications.

UNIT-IV: Manufacturing of Polymer Matrix Composites: Preparation of Moulding compounds and prepregs – hand layup method – Autoclave method – Filament winding method – Compression moulding – Reaction injection moulding. Properties and applications.

UNIT – V: Strength: Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first ply failure-insight strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using caplet plots; stress concentrations.

TEXT BOOKS:

1. Material Science and Technology – Vol 13 – Composites by R.W.Cahn – VCH, West Germany.
2. Materials Science and Engineering, An introduction. WD Callister, Jr., Adapted by R. Balasubramaniam, John Wiley & Sons, NY, Indian edition, 2007.

References:

1. Hand Book of Composite Materials-ed-Lubin.
2. Composite Materials – K.K.Chawla.
3. Composite Materials Science and Applications – Deborah D.L. Chung.
4. Composite Materials Design and Applications – Danial Gay, Suong V. Hoa, and Stephen W. Tasi.