

# **SHRI VENKATESHWARA UNIVERSITY**



## **EVALUATION SCHEME M.TECH (Structural Engineering) PART-TIME**

**(Two Years Post Graduation Programme)**

**(w.e.f. 2019-20)**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**Evaluation for M.Tech (Structural Engineering-Part time)**

SEMESTER-V													
Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	WSE-051	Design of Prestressed Concrete Structures	3	0	0	20	10	30		70		100	3
2	WOE-555	Composite Materials	3	0	0	20	10	30		70		100	3
3	WSE-521	Dissertation Phase – I	0	0	20				125		125	250	10
		Total										450	16

## **M.TECH SE (Semester V)**

### **WSE-051 – Design of Advanced Concrete Structures (Credits - 3:0:0 = 3)**

Teaching Scheme Lectures: 3 hrs/week

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

1. Analyse the special structures by understanding their behaviour.
2. Design and prepare detail structural drawings for execution citing relevant IS codes.

Syllabus Contents:

- ☐ Design philosophy, Modeling of Loads, Material Characteristics.
- ☐ Reinforced Concrete - P-M, M-phi Relationships, Strut-and- Tie Method, Design of Deep Beam and Corbel, Design of Shear Walls, Compression Field Theory for Shear Design, Design against Torsion; IS, ACI and Eurocode.
- ☐ Steel Structures -- Stability Design, Torsional Buckling - Pure, Flexural and Lateral, Design of Beam-Columns, Fatigue Resistant Design, IS code, AISC Standards and Eurocode.

References Books:

- ☐ Reinforced Concrete Design, Pillai S. U. and Menon D., Tata McGraw-Hill, 3rd Ed, 1999.
- ☐ Design of Steel Structures, Subramaniam N., Oxford University Press, 2008.
- ☐ Reinforced Concrete Structures, Park R. and Paulay T. , John Wiley & Sons, 1995.
- ☐ Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.
- ☐ Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010.
- ☐ Steel Structures Design and Behavior Emphasizing Load and Resistance Factor Design, Salmon C. G., Johnson J. E. and Malhas F. A., Pearson Education, 5th Ed, 2009.
- ☐ Design of Steel Structures - Vol. II, Ramchandra. Standard Book House, Delhi.
- ☐ Plastic Methods of Structural Analysis, Neal B.G., Chapman and Hall London.

## **WSE- 555: COMPOSITE MATERIALS**

**Course Type: Elective; Instruction: L-T-P-C: 3-0-0-3**

**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.

**WSE-521: DISSERTATION PHASE- I**

**Course Type: Core; Instruction: L-T-P-C: 0-0-20 (10)**

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

CO1	Define Research Problem Statement.
CO2	Critically evaluate literature in chosen area of research & establish Scope of work.
CO3	Develop Study Methodology.
CO4	Carryout Pilot Study.

**Detailed Syllabus:**

There is no prescribed syllabus. Students are required to search, collect and review various research articles published in chosen area of research. A student has to select a topic for his dissertation, based on his/her interest and the available facilities at the commencement of dissertation work. A student shall be required to submit a dissertation report on the research work carried out by him/her.

**READING:**

1. Conference / Seminar Proceedings.
2. Derek Swetnam, Writing Your Dissertation, 3<sup>rd</sup> Edition, Oxford, UK, 2004.
3. Handbooks / Research Digests.
4. Journal Publications.