AGENDA

M.Tech – II Year I Sem

- Approval of Design of Pre-stressed Concrete structures Syllabus (AMR-24).
- Approval Construction Management Syllabus (AMR-24).

Design of Pre-stressed Concrete structures Theory Syllabus (AMR-25).

L	T	P	C
3	0	0	3

Assessment Method	Marks
Internal Evaluation	25
Semester End Examination	75
Total	**100**

Program Educational Objectives

Design of Pre-stressed Concrete structures

1. **PEO 1 – Core Knowledge**

   Graduates will acquire fundamental knowledge in the concepts, behavior, and principles of pre-stressed concrete structures.

2. **PEO 2 – Technical Competence**

   Graduates will be able to apply IS codes, modern tools, and analytical methods to design safe and economical pre-stressed concrete members.

3. **PEO 3 – Problem Solving & Innovation**

   Graduates will develop the ability to solve complex structural engineering problems with innovative design approaches in bridges, buildings, and special structures.

COURSE OUTCOMES

Design of Pre-stressed Concrete structures

- CO1 Explain the principle, types and systems of prestressing and analyze the deflections.
- CO2 Determine the flexural strength and design the flexural members, end blocks.
- CO3 Analyze the statically indeterminate structures and design the continuous beam.
- C04 Design the tension and compression members and apply it for design of piles.
- C05 Analyze the stress, deflections, flexural and shear strength and apply it for the design of bridges.
- C06 Analyze the Composite construction of Pre-stressed and in-situ concrete.

SYLLABUS

UNIT :I

Introduction – Prestressing Systems – Pretensioning Systems – Postensioning Systems – High Strength Steel and Concrete - Analysis of Prestress - Resultant Stresses at a Section – Pressure Line or Thrust Line – Concept of Load Balancing - Losses of Prestress – Loss Due to Elastic Deformation of Concrete – Shrinkage of Concrete – Creep – Relaxation of Stress in Steel – Friction – Anchorage Slip.

UNIT :II

DEFLECTIONS OF PRESTRESSED CONCRETE MEMBERS : Importance of Control of Deflections – Factors Influencing Deflection – Short-term Deflections of Uncracked Members – Prediction of Long-time Deflections – Deflections of Cracked Members – Requirements of IS 1343-2012. Ultimate Flexural Strength of Beams: Introduction, Flexural theory using first principles – Simplified Methods – Ultimate Moment of Resistance of untensioned Steel

SYLLABUS

UNIT: III

COMPOSITE CONSTRUCTIONS: Introduction, Advantages, Types of Composite Construction, Analysis of Composite beams- Differential shrinkage- Ultimate Flexural and shear strength of composite sections- Deflection of Composite Beams. Design of Composite sections

UNIT: IV

PRESTRESSED CONCRETE SLABS: Types Of Prestressed Concrete Floor Slabs- Design of Prestressed Concrete One Way and Two Way Slabs.

Prestressed Concrete Pipes and Poles : Circular prestressing- Types of Prestressed Concrete Pipes- Design of Prestressed Concrete Pipes - Prestressed Concrete Poles.

UNIT :V

CONTINUOUS BEAMS: Advantage of Continuous Members – Effect of Prestressing Inderterminate Structures – Methods of Achieving Continuity – Methods of Analysis of Secondary Moments – Concordant Cable Profile – Guyon's Theorem. Redistribution of moments in a continuous beam. Anchorage Zone Stresses in Beams : Introduction, Stress distribution in End Block – Anchorage zone stresses –Magnel's method- Guyon's Method - Anchorage zone Reinforcement

SYLLABUS

TEXT BOOKS

i. 1. Prestressed Concrete, 6e by N. Krishna Raju, Mc Graw Hill Publishers
ii. 2. Prestressed Concrete by K. U.Muthu, PHI Learning Pvt Limited

REFERENCES:

i. 1. Prestressed Concrete Analysis and Design, Antone E. Naaman 2e, Techno Press 3000
ii. 2. Design of Prestressed Concrete- T. Y. Lin, Ned H. Burns 3e, Wiley Publications
iii. 3. Design of prestressed Concrete by E.G. Nawy
iv. 4. Prestressed Concrete by N. Rajagopalan, Narosa Publishing
v. 5. IS1343 2012 Prestressed concrete Code of Practice

Construction Management Syllabus (AMR-24).

L	T	P	C
3	0	0	3

Assessment Method	Marks
Internal Evaluation	25
Semester End Examination	75
Total	**100**

COURSE OUTCOMES

Construction Management

- CO1: Understand the principles and importance of construction management in civil engineering projects.
- CO2: Apply project planning and scheduling techniques (CPM, PERT, bar charts, etc.) to construction works.
- CO3: Analyze resource allocation, material management, and cost estimation for effective project execution.
- CO4: Demonstrate knowledge of quality control, safety measures, and legal aspects in construction projects.
- CO5: Utilize modern tools, software, and techniques for project monitoring and control.

SYLLABUS

UNIT: I

Management process- Roles. Management theories. Social responsibilities. Planning and strategic management. Strategy implementation. Decision making: tools and techniques – Organizational structure. Human resource management- motivation performance- leadership

UNIT: II

Classification of Construction projects, Construction stages, Resources- Functions of Construction Management and its Applications. Preliminary Planning- Collection of Data- Contract Planning – Scientific Methods of Management: Network Techniques in construction management - Bar chart, Gant chart, CPM, PERT- Cost & Time optimization

SYLLABUS

UNIT: III

Resource planning - planning for manpower, materials, costs, equipment. Labour -Scheduling - Forms of scheduling - Resource allocation. budget and budgetary control methods

UNIT: IV

Contract - types of contract, contract document, and specification, important conditions of contract – tender and tender document - Deposits by the contractor - Arbitration. negotiation - M.Book - Muster roll -stores

UNIT: V

Management Information System - Labour Regulations: Social Security - welfare Legislation - Laws relating to Wages, Bonus and Industrial disputes, Labour Administration - Insurance and Safety Regulations - Workmen's Compensation Act -other labour Laws - Safety in construction: legal and financial aspects of accidents in construction. occupational and safety hazard assessment. Human factors in safety. Legal and financial aspects of accidents in construction. Occupational and safety hazard assessment.

SYLLABUS

REFERENCE:

1. Ghalot, P.S., Dhir, D.M., Construction Planning and Management, Wiley Eastern Limited,1992.
2. Chitkara,K.K., Construction Project Management¸ Tata McGraw Hill Publishing Co, Ltd., New Delhi,998.
3. Punmia,B,C., Project Planning and Control with PERT and CPM, Laxmi Publications, New Delhi,1987.
4. Sengupta, B. &Guha, H, Construction Management and Planning by: Tata McGraw-hill publications.