Bridge Designing and Analysis

Learning Goals: - The participants will get the knowledge and concept of Structure , Concept of Bridge Technologies, Materials Concept , Designing Factor , optimization features like strength to weight ratio, Structure Analysis Procedure , Fluid Resistance Structure Design , Aerodynamics of Bridge.

Course content:-

SESSION 1

1. **Introduction of design.**

a) What is design?
b) Types of design.
c) Importance of design.

2. **Introduction of structure.**

a) What is structure?
b) Types of structure.
c) Structural member.

3. Structural design process.

4. Structural connection.

5. Truss members and bracing.

6. Structural loads.

a) Dead load.
b) Live load.
c) Wind load.
d) Snow load.
e) Seismic load.

7. Structural analysis.

8. Steel design.

a) What is steel?
b) Properties.
c) Effect of carbon in steel.
d) Disadvantage.

9. Concrete design.

a) What is concrete?
b) Properties.
c) Concrete grade.

SESSION 2 (PRACTICAL)

10. Introduction of staad pro.

a) Advantages.
b) Difference in auto cad and staad pro.

Introduction to Geometry

- Creation of Geometry
- Modifying Geometry of Members.
- Use of Bracings in Structure.
- Placement of Bracings in Structure.
- Geometry of Bracings in Structure.
- Miscellaneous Geometry in the Structure - Curved Beams, Solids.
- Revision of Geometry of Structure as in Architectural Drawing.
- Meaning of Property of Members – Steel and Concrete.
- Releases in members.
- Meaning of Connections in Steel members.
- Concrete Joints and Connections.

- Use of Master/Slave Joints.

- Truss, Tension and Compression members.
- Introduction to various types of Supports- Fixed, Pinned, Fixed But and Enforced but Supports.
- Various Types of Loadings.
- Basics of Dead Load, Live Load and Snow Load.
- Various Types of Loadings- Continued.

SESSION 3

11. Introduction of bridge.

- What is bridge?
- Importance of Bridge.
- Allowable Stress Design
- Load and Resistance Factor Design

12. Principles of Limit States Design.

- Design Procedures
- Allowable Stress Design (ASD)
- Load and Resistance Factor Design (LRFD)

13. Loads

- Permanent Loads
- Dead Loads
- Transient Loads
- Vehicular Live Load LL
- Pedestrian Live Load PL
- Water Load and Stream Pressure Force WA
- Wind Load WS and WL
- Earth Loads

14. Aerodynamics of bridge.

15. Types of bridges.

a) Arch bridge.
b) Cantilever bridge.
c) Beam bridge.
d) Cable stayed bridge.

SESSION 4 (Practical)

Live projects on software.

a) Design and analysis of Arch bridge.
b) Design and analysis of Cantilever bridge.
c) Design and analysis of Cable stayed bridge.

Duration: - 2 DAYS

Fee: - 1050INR + Service Tax (per participants)