

Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE5031W - Design of Steel Bridges

Credit Distribution: C:10 L:3 T:1 P:0 E:0 O:6 TH:0

Course Type: Theory

Description: To provide students with understanding of:

- (1) Types of steel bridges,
- (2) Analysis and design of members and connections in traditional steel bridges, and
- (3) Special cases of steel and steel-concrete composite bridges components.

Course Content: Types of Steel Bridges Steel plate girder and truss bridges; steel-concrete composite bridges; steel deck bridges Materials Grades of steel of members, design of bolts and welds as per Indian and international codes Design Standards IRS, IRC and other International Standards Structural Design Allowable Stress Design & Limit State Design; Connections; fatigue in members and connections; stiffeners - best location and design; anchor bolts and base plate; other steel-concrete connections; post-installed anchors Structural Components Bridge deck; steel-concrete composite girder; steel and composite piers and piles; bracing systems Special Issues Load Rating; Launching Methodology and Design of Launching Girder; Erection Stage Analysis; Fabrication Sensitive Design and Detail; Redundancy and Fracture Control; Thermal Loading; Corrosion Protection

Text Books

- None

Reference Books

- Chatterjee,S., (2003), The Design of Modern Steel Bridges, 2nd Edition, Wiley
- Barker,R.M., and Puckett,J.A., (2013), Design of Highway Bridges, An LRFD Approach, 3rd Edition, Wiley
- Federal Highway Administration, (2015), Engineering for Structural Stability in Bridge Construction, Publication No. FHWA-NHI-15-044, Office of Bridge Technology, USA
- Å...kesson,B., (2008), Understanding Bridge Collapses, 1st Edition, CRC Press
- Beg,D., Kuhlmann,U., Davaine,L., and Braun,B., (2010), Design of Plated Structures- Eurocode 3: Design of Steel Structures, Part 1-5 - Design of Plated Structures, ECCS & Ernst and Sohn

Prerequisite: NIL