Mechanics
UES009

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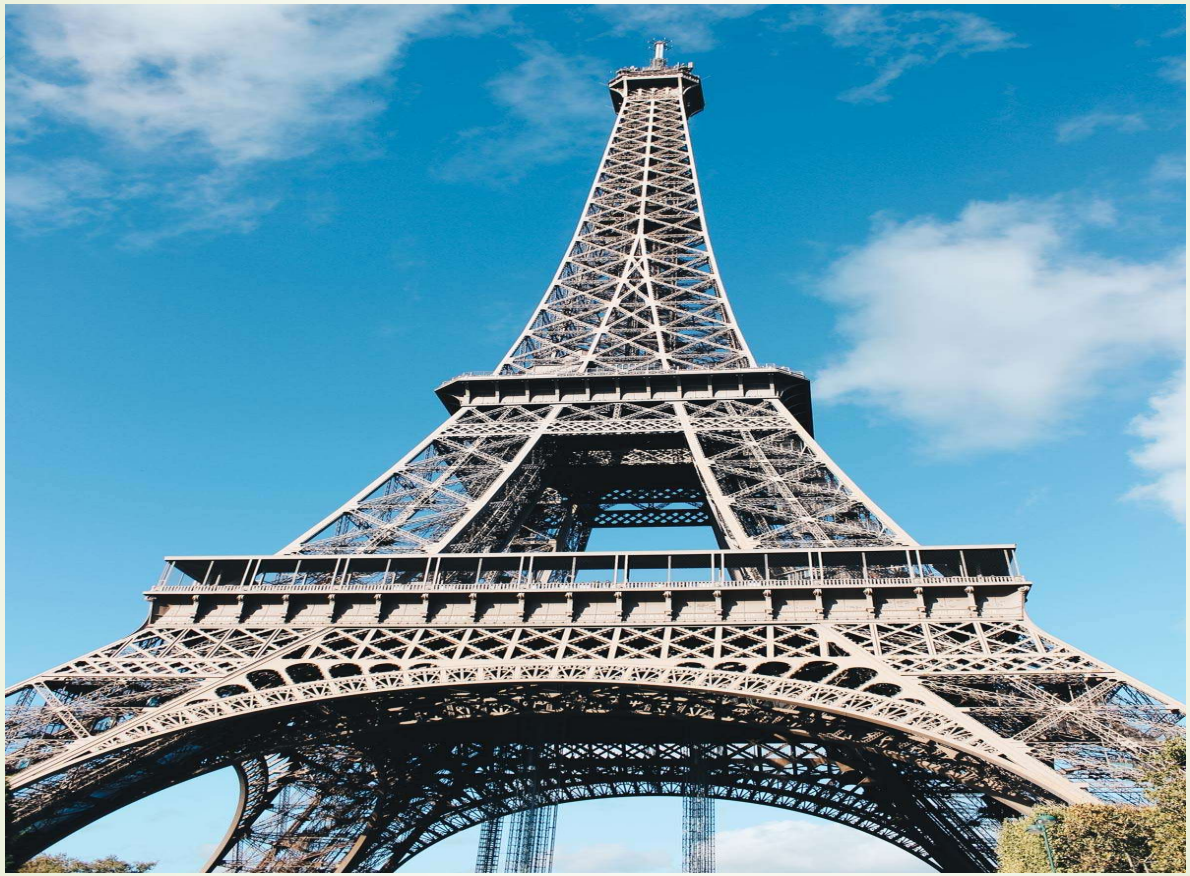
Course Contents and Evaluation Scheme



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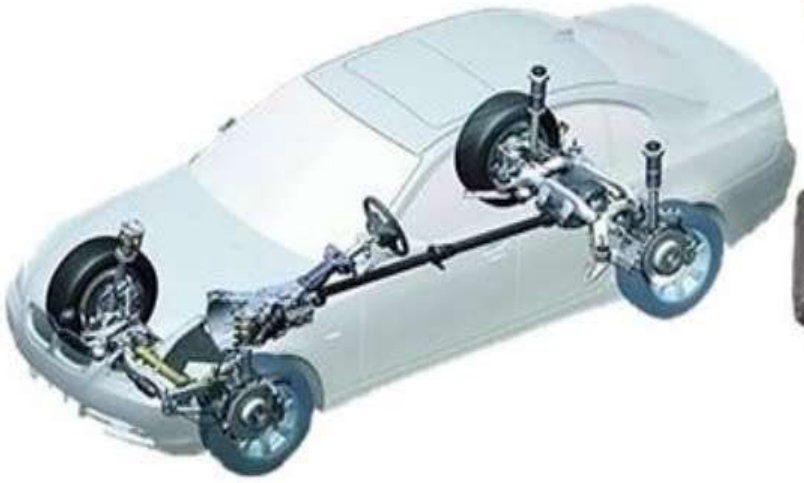

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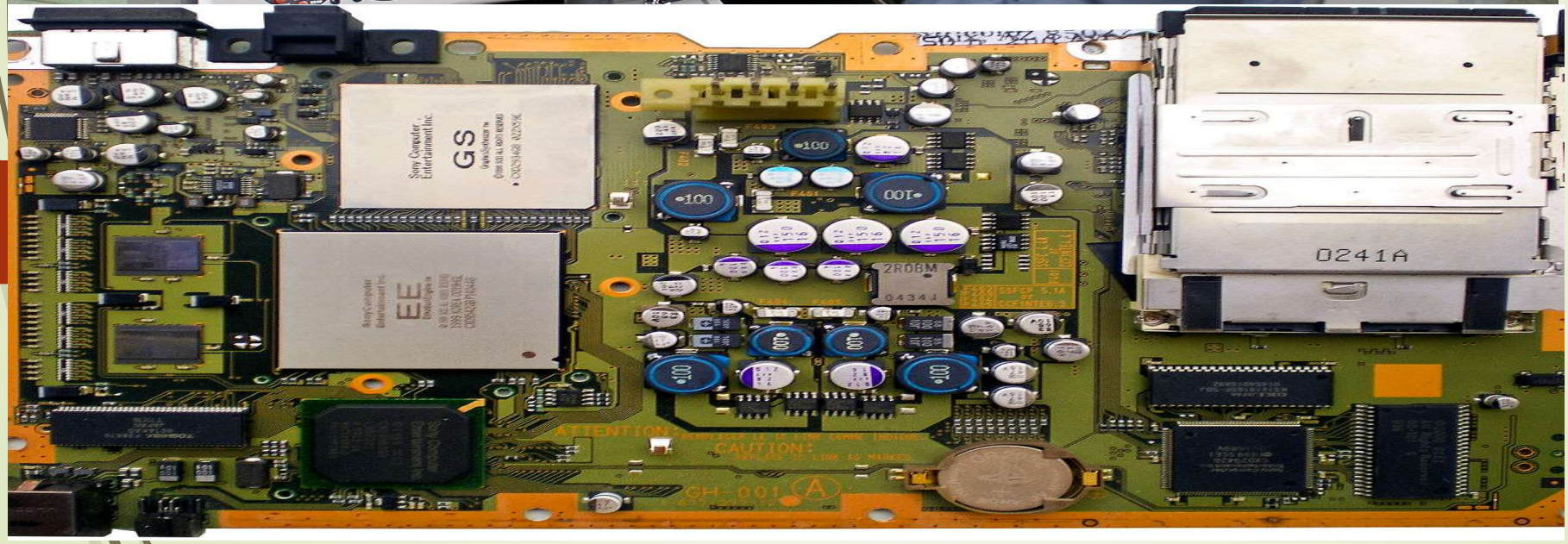

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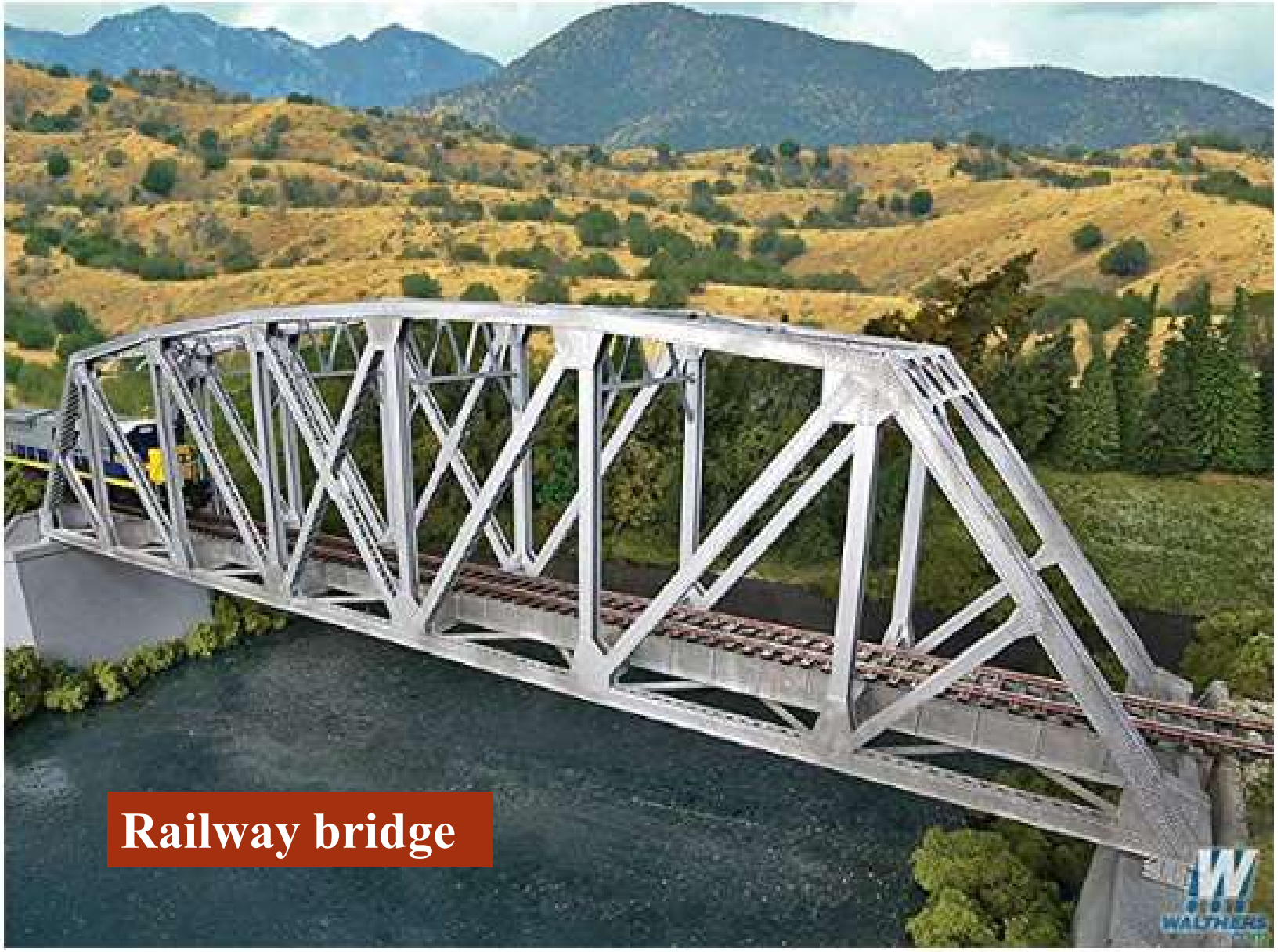

Railway bridge

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L	T	P	Cr
2	1	2*	2.5

(*Two hours Lab Once In Semester)

Course Objectives:

The objective of this module is to help students develop the techniques needed to solve general engineering mechanics problems. Students will learn to describe physical systems mathematically so that their behaviour can be predicted.

Course Contents:

- **Review of Newton's laws of motion and vector algebra:**
- **Equilibrium of Bodies**: Free-body diagrams, conditions of equilibrium, moment due to a force, statical determinacy.

Course Contents…..

- **Plane Trusses**: Forces in members of a truss by method of joints and method of sections.
- **Properties of Plane Surfaces**: First moment of area, centroid, second moment of area etc.
- **Friction**: Sliding, belt, screw and rolling.
- **Virtual Work**: Principle of virtual work, calculation of virtual displacement and virtual work.
- **Shear Force and Bending Moment Diagrams:** Types of load on beams, classification of beams; axial, shear force and bending moment diagrams: simply supported, overhung and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment.

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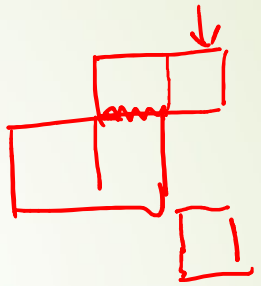
Course Learning Outcomes (CLOs):



The students will be able to:

1. Determine resultant in plane force systems
2. Identify and quantify all forces associated with a static framework
3. Draw Shear Force Diagram and Bending Moment Diagram in various kinds of beams subjected to different kinds of loads.

Text Books:

1. Shames, I. H. Engineering Mechanics: Dynamics, Pearson Education India (2006).
2. Beer, Johnston, Clausen and Staab, Vector Mechanics for Engineers, Dynamics, McGraw-Hill Higher Education (2003).

Reference Books:

1. Hibler, T.A., Engineering Mechanics: Statics and Dynamics, Prentice Hall (2012).
2. Timoshenko and Young, Engineering Mechanics, Tata McGraw Hill Education Private Limited, (2006).

Other Books:

Basudeb Bhattacharyya, Engineering Mechanics- Oxford Higher Education

Evaluation Scheme

- Sessional – 30 Marks — Tutorials/Quizzes/Tests/Project
- Written Test – 70 Marks

Total 100 Marks

Experimental Project Assignment/ Micro Project:

Students in groups of 4/5 will do project on **Model Truss Bridge.**

Experiment: This will involve construction of a model truss bridge using steel wire and wood.