



## Department of Civil Engineering Indian Institute of Technology Kanpur

Announcing Workshop on  
*Structural Analysis using SAP2000*  
To be conducted at IIT Kanpur during March 18-19, 2015

### WORKSHOP OBJECTIVES

The aim of the workshop is to provide the participants an overview on Structural Analysis using SAP2000.

### PARTICIPANTS

The workshop is designed for

- Civil Engineers engaged in planning, design, or construction of structures.
- Senior professionals responsible for directing these activities

### WORKSHOP CONTENTS

1. Modelling of a structure: an overview, Objectives and strategies
2. Analysis Flavours: Linear, Non-linear
3. Introduction to SAP2000: Its history and current capabilities.
4. SAP2000 GUI, Modelling overview from start to finish by a simple example
5. Object based modelling: Major differences from element based modelling. Good work methods
6. Modelling Objects of SAP2000 viz, point, line, area, volume and link objects. Polymorphism of objects,
7. Point Object: The most basic object, its usefulness and modelling options. When to use multiple points at same location,
8. Constraints and their usefulness, Edge Constraints and their role in analysis
9. Line objects: Utility of line objects, Modelling scope viz, truss, 3D beam, cable, tendon, load application, Assignment options for changing the character of line object
10. Area objects: Utility of Area Objects, Modelling scope viz. membrane, plate, shells, Uniform shell, layered shell, load application, Other Assignment options of area objects
11. Other area objects: Plane and solid area objects their usefulness and class of problems which can be handled
12. Volume objects: Utility of volume objects, Modelling scope, load application and other assignment options
13. Link Objects: Utility of Link Objects, Modelling scope, detailed treatment of linear and non-linear link objects

14. Setting up load cases for analysis. Overview of analysis available in SAP2000 viz. Linear/Nonlinear cases and types such as static, multistep static, influence lines, buckling, modal, time history, steady state, hyperstatic etc.

15. Simple examples of each type of analysis. Non-linear analysis to account for contact problems and geometric non-linearity like P-Delta analysis, Staged analysis etc.

16. Non-linear Pushover analysis. An overview, objectives and strategies. Detailed example of pushover analysis, interpretation of results and drawing the inferences.

17 Discrete non-linear elements. The usefulness of such non-linear elements. Concept of energy dissipation. Analysis with dampers and base isolators.

18. Base Isolation basics.

19. Design of concrete frame, shell elements in SAP2000

20. Design of Steel frame elements in SAP2000.

### WORKSHOP FACULTY

The workshop will be conducted by

- Prof. Durgesh C. Rai, IIT Kanpur ,
- Mr. Rajiv Sharma, CSI New Delhi and
- Mr. Hemant Kumar, CSI New Delhi.

### VENUE

The workshop will be conducted at IIT Kanpur.

### REGISTRATION

The workshop fee is Rs. 15,000/- (Rupees Fifteen Thousand Only) per participant. It includes workshop material, lunch, and tea breaks. The fee is payable in advance by a crossed draft in favour of *Workshop on SAP, IIT Kanpur* or through credit card by December 31, 2014. Limited twin-sharing accommodation is available on first-come first-served basis at IITK Guest House on payment.

Interested persons should send the enclosed Registration Form to:

Cdr (Retd.) Suresh Ailawadi  
Department of Civil Engineering  
Indian Institute of Technology Kanpur  
Kanpur - 208 016  
Phone: (0512) 2597749 Email: [asuresh@iitk.ac.in](mailto:asuresh@iitk.ac.in)