COURSE OUTLINE:

Strength of Materials is a fundamental subject needed primarily for the students of Mechanical sciences. As the engineering design of different components, structures etc. used in practice are done using different kinds of materials, it is essential to understand the basic behavior of such materials. The objective of the present course is to make the students acquainted with the concept of load resultant, consequences and how different kinds of loadings can be withstood by different kinds of members with some specific materials. NPTEL lecture series on Strength of Materials are prepared, explaining the fundamentals in a simple and lucid manner so that the students can grasp the basics of the application of loading system and its consequence in a deformable body.

ABOUT INSTRUCTOR:

Prof. Sriman Kumar Bhattacharyya is a senior Professor and former Head of Civil Engineering at IIT Kharagpur. He was the Director of CSIR-Central Building Research Institute at Roorkee for six years between 2009 to 2015. He has a vast experience in teaching and research in Structural Engineering. Presently he is the Deputy Director of IIT Kharagpur. His areas of research include fluid-structure interaction, structural health monitoring, sustainable materials amongst others. He has published more than 200 papers in peer reviewed National / International journals and conferences. He is a Fellow of Indian National Academy of Engineering, Indian Association of Structural Engineering and Institution of Engineers (India).

COURSE PLAN:

- **Week 01**: Analysis of stresses
- **Week 02**: Analysis of strain
- **Week 03**: Stress-strain relations
- **Week 04**: Uniaxial loading
- **Week 05**: Torsion
- **Week 06**: Bending of Beams - 1
- **Week 07**: Bending of Beams - 2
- **Week 08**: Deflection of Beams - 1
- **Week 09**: Deflection of Beams - 2
- **Week 10**: Combined stresses
- **Week 11**: Stability of columns
- **Week 12**: Spring