

# Aeroelasticity

---

## Overview

Aeroelasticity is a subject that deals with the interaction of the elastic bodies with surrounding air. Aeroelastic analysis is crucial for the design and qualification of flying vehicles. Apart from Aerospace Engineering aeroelasticity is gradually finding its growing application in the fields of Civil and Mechanical Engineering also.

The course is organized in two modules. Module A will start with an introduction to aeroelasticity with basic examples. After that the topics related to static aeroelasticity such as divergence problem for different wing types, aileron effectiveness and reversal will be covered. Module B will be focusing on the topics of dynamic aeroelasticity such as flutter, gust response etc. and aeroelastic control. This course is organized in two modules that should be taken together.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

<b>Modules</b>	<b>A: Static Aeroelasticity : Dec 19 – Dec 21</b> <b>B: Dynamic Aeroelasticity : Dec 21 – Dec 28</b> <b>Number of participants for the course will be limited to fifty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>▪ you are an engineer or research scientist dealing with aerospace or other structures exposed to heavy load due to air and interested in the analysis and design of such structures with consideration to the aeroelastic effect</li><li>▪ You are a student or faculty from academic institution interested in learning how to do aeroelastic analysis and design of structures.</li></ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$500</b> <b>Industry/ Research Organizations: ` 30000</b> <b>Academic Institutions (Students): ` 1000</b> <b>Academic Institutions (Teachers): ` 10000</b> The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

## The Faculty

**Professor Rakesh K. Kapania**, Norris and Laura Mitchell Professors



of Aerospace Engineering at Virginia Polytechnic Institute and State University, is a very well-known researcher in the field of Aerospace Structures. His teaching interest includes subjects like Thin Walled Structures, Vehicle Vibration and Control, Vehicle

Structures, Finite Element Method, Numerical Analysis, Vibrations and Flutter, Variational Calculus etc. As a researcher he has made significant contribution to the areas like Computational Structural Mechanics with applications in Aeroelasticity, Multidisciplinary Analysis and Design, Probabilistic Structural Mechanics, Damage Identification, Smart Structures, and Laminated Plates and Shells. So far he has advised more than 35 Ph.D. students. He has published about 150 research papers in major technical journals.

**Professor B. N. Singh** is Professor and currently Head of the



Department of Aerospace Engineering at the Indian Institute of Technology Kharagpur, India. His research interest is directed towards advanced composite Structures, and multi-scale modeling of advanced materials. He is working in the area of aerospace composite structures and its uncertainty

quantification and has developed several stochastic and deterministic mathematical models and its applications in aerospace structural components made of smart composites. His current research interests also include plates and shells, functionally graded materials, analytical and finite element modeling, shear deformation theories, aeroelasticity, and nonlinear adaptive FEM. So far he has supervised 11 Ph.D. students and published about 110 research papers in major technical journals.

**Professor D. K. Maiti** is a Professor in the Department of Aerospace



Engineering at Indian Institute of Technology Kharagpur. His research interest is aeroelasticity, damage assessment of structures, and structural optimization. He has more than 40 international journal papers and more than 50 national and international conference papers to his credit.

**Prof. Md. Rabius Sunny** joined the Department of Aerospace



Engineering at Indian Institute of Technology Kharagpur as an Assistant Professor in the year 2014. His areas of research include structural dynamics, fluid structure interaction, damage assessment of structures, finite element analysis.

## Course Co-ordinators

**Prof. Mohammed Rabius Sunny**

**Principal Co-ordinator**

Phone: +91-(0) 3222-282850

E-mail: sunny@aero.iitkgp.ernet.in

**Professor B. N. Singh**

**Co-ordinator**

Phone: +91-(0) 3222-283026

E-mail: bnsingh@aero.iitkgp.ernet.in

.....  
<http://www.gian.iitkgp.ac.in/GREGN>