



# INTRODUCTION TO COMPOSITES

## **PROF. NACHIKETA TEWARI**

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**PRE-REQUISITES :** Must be enrolled into a B. Tech. program or equivalent and should have completed at least second year of his 4-year program.

**INTENDED AUDIENCE :** UGs, PGs, professionals in industry who want to learn about basics of sound and acoustics

**INDUSTRIES SUPPORT :** Automotive, Composites, Aerospace, Sports, Railways, Power Generation and all industry that has to address issues related to noise.

### **COURSE OUTLINE :**

This course is intended for all those who want to conduct experiments in area of NVH. Thus, the course is open to students of engineering and science, and also to all those who from the industry and research organizations – who are working in area of sound, NVH and acoustics. Each lecture will be followed by a quiz, which will help student the concepts better, and gain deeper insights to measurement process. The course is fairly generic so that there is no need for a particular background. Rather, what is needed is openness, and ability to learn and check out new ideas with comfort.

### **ABOUT INSTRUCTOR :**

Prof. Nachiketa Tiwari is an Associate Professor of Mechanical Engineering at IIT Kanpur. He has a PhD in engineering mechanics from Virginia Tech. His doctoral thesis involved nonlinear analysis of composite structures through FE, analytical and experimental methods. Dr. Tiwari also has deep understanding of fundamentals of FEA as he has used several tools in industry for over a dozen years for producing world class products. His current areas of research interest are composite structures, noise, vibrations, and product design. He has established Dhvani, an Acoustics Lab at IITK, which is one of the best in the country.

### **COURSE PLAN :**

**Week 1:** Intro and terminology

**Week 2:** Concept Review

**Week 3:** Fibers

**Week 4:** Matrix materials

**Week 5:** Short fiber composites

**Week 6:** Short fiber composites (Cont'd)

**Week 7:** Orthotropic lamina

**Week 8:** Orthotropic lamina

**Week 9:** Orthotropic lamina (Cont'd)

**Week 10:** Composite laminates

**Week 11:** Composite laminates

**Week 12:** Composite laminates (Cont'd)