BASICS OF FINITE ELEMENT ANALYSIS - I

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PRE-REQUISITES : Must be enrolled into a B. Tech. program or equivalent and should have completed 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 APPLICABLE TO : Automotive, NVH, Acoustics, Railways, Power Generation and all industry that has to address issus related to noise.

COURSE OUTLINE :

This course is intended for all those who want to learn FEA from an application standpoint. Currently, many users of FEA have limited understanding of theoretical foundation of this powerful method. The consequence is that quite often they use commercial codes inaccurately, and do not realize that their results may be flawed. The course is intended to address this limitation by making the student aware of the underlying mathematics in easy to understand format. The course is open to all engineering students who have at the minimum successfully completed two years of their B. Tech (or equivalent) degrees.The course is also open to all professionals in industry who wish to learn fundamentals of FEA in a semi-formal but structured setting, and plan to use this knowledge in their workplace.

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 Dhwani, an Acoustics Lab at IITK, which is one of the best in the country.

COURSE PLAN :

Week 1 : Intro & concepts

Week 2 : Mathematical concepts

Week 3 : 1-D BVP problems of 2nd order

Week 4 : Applications: heat transfer/solid mechanics

Week 5 : Beams

Week 6 : Errors & convergence

Week 7 : Time dependent problems

Week 8 : Eigen value problems and closure