THEORY OF COMPOSITE SHELLS

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TYPE OF COURSE : Rerun | Elective | PG
COURSE DURATION : 8 weeks (24 Jan' 22 - 18 Mar' 22)
EXAM DATE : 27 Mar 2022

PRE-REQUISITES : Advanced Solid Mechanics

INTENDED AUDIENCE : Research scholar and Faculties

INDUSTRIES APPLICABLE TO : NAL,ISRO,ANSYS,ABAQUS

COURSE OUTLINE :

Like beams and plates, shells are the functional element of structural engineering.At research level, a large group of researches work in the field of bending, free vibration, buckling and post buckling analysis of shells made of composites, sandwiches and advance material. In this course,basic concept of doubly curved surfaces will be developed and governing equation will be developed.This will help the participants to develop the shell equations as per their requirement.Bending,free vibration and buckling of shell will be explained.Atutorial using ABAQUS will also be conducted.

ABOUT INSTRUCTOR :

Prof.Poonam Kumari is currently an Associate Professor in the Department of Mechanical Engineering of the Indian Institute of Technology Guwahati.She received her Ph.D. degree from Indian Institute of Technology Delhi in 2012.She did her Post-Doctoral Fellowship at Simon Fraser University.She works in the area of Continuum Mechanics and Smart Material and structures.She has developed three-dimensional as well as two-dimensional solution for composite and piezolaminated plates.She has 29 International Journal publications and 29 International Conference publications.She is teaching course of Theory of plates and Shells since 2014 at IIT Guwahati.She has also conducted an online course on theory of rectangular plate under MOOCs.Her course was selected for faculty development programme course by AICTE.She received Young Engineer Award in 2017 from Indian National Academy of Engineers very recently, she also received approval for SERB women excellence award,2019.

COURSE PLAN :

Week 1**:** Curvilinear coordinate system and various fundamental of surfaces

Week 2**:** Classification of shell theories

Week 3**:** Development of governing equations

Week 4**:** Use of shell constitutive relations and special cases

Week 5**:** Navier solutions for Cylinderical shells under bending load

Week 6**:** Navier solution to axisymmetric,unsymmetrical cases

Week 7**:** Free vibration and buckling of cylindrical shells and basic development for Levy solutions

Week 8**:** Introduction to three dimensional solutions of cylindrical shell