



COMPUTER METHODS OF STRUCTURAL ANALYSIS OF OFFSHORE STRUCTURES

PROF. SRINIVASAN CHANDRASEKARAN

Department of Ocean Engineering
IIT Madras

TYPE OF COURSE : Rerun | Core | UG/PG

COURSE DURATION : 12 weeks (20 Jul' 20 - 9 Oct' 20)

EXAM DATE : 17 Oct 2020

PRE-REQUISITES : nil

INTENDED AUDIENCE : Civil, Mech, Aero, Appl. Mech., Naval arch., Structures

INDUSTRIES APPLICABLE TO : ONGC, Reliance, UGC, Technip

COURSE OUTLINE :

The course will give a brief overview of different types of offshore structures that are deployed in sea for exploiting oil, gas and minerals. Detailed analysis methods, as applicable to both 2d and 3d will be discussed. While fundamentals of advanced structural analysis are discussed, detailed mathematical modeling of problem formulation and solution using MATLAB coding will be discussed. Codes for numeric examples will be also provided in the lecture notes. Hands-on experience of using Matlab will also be discussed. Focus is on explanation of fundamental concepts of advanced structural analysis, with special emphasis to its application to offshore structures.

ABOUT INSTRUCTOR :

Prof. Srinivasan Chandrasekaran is currently a Professor in the Dept. of Ocean Engineering, Indian Institute of Technology Madras, India. He has teaching, research and industrial experience of about 23 years during which he has supervised many sponsored research projects and offshore consultancy assignments both in India and abroad. His active areas of research include dynamic analysis and design of offshore platforms, Development of geometric forms of compliant offshore structures for ultra-deep water oil exploration and production, sub-sea engineering, Rehabilitation and retrofitting of offshore platforms, structural health monitoring of ocean structures,

COURSE PLAN :

- Week 1:** Indeterminate structures
- Week 2:** Stiffness method: Plane orthogonal structures
- Week 3:** stiffness method: Plane non-orthogonal structures
- Week 4:** Analysis using sub-structure techniques
- Week 5:** Types of offshore structures
- Week 6:** Environmental loads
- Week 7:** Analysis of Articulated towers
- Week 8:** New-generation offshore platforms
- Week 9:** Analysis of Offshore Buoyant Leg structures
- Week 10:** Stochastic process
- Week 11:** Random loading, Response spectrum
- Week 12:** Analysis under fatigue loads