Course Type	Course Code	Name of Course	L	T	P	Credit
DP	**NCEC544**	**Computational Laboratory in Structural Engineering II**	**0**	**0**	**3**	**1.5**

Course Objective
The course aims to impart knowledge of advanced computational aspects of Structural Engineering.
Learning Outcomes
Upon successful completion of this course, the students should be able to: ● Learn the computational aspects of Structural Engineering.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Solution of two-dimensional structural element by using Galerkin's weighted residual method.	6	Learn to analyze two-dimensional structural elements by using Galerkin's weighted residual method.
2	Solution of 3D Bernoulli frame by using the finite element method through programming in MATLAB®.	6	Learn to analyze 3D Bernoulli frame by using the finite element method through programming in MATLAB®.
3	Solution of Kirchhoff plate by using programming in MATLAB®.	6	Learn to analyze Kirchhoff plate by using programming in MATLAB®.
4	Introduction to finite element software	3	Learn to use finite element software.
5	Solution of plane stress/plane strain problems by using the finite element software.	6	Learn to solve plane stress/plane strain problems by using finite element software.
6	Solution of 2D frames by using the finite element software.	6	Learn to solve 2D frames by using the finite element software.
7	Vibration analysis using finite element software.	3	Learn to perform vibration analysis using finite element software.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
8	Revision	6	Revision of previous classes.
	Total Contact Hours	**42**	

Text Books:

1. Ferreira, A. J. (2009). MATLAB codes for finite element analysis. Amsterdam: Springer Netherlands.

Reference Books:

1. Shrikhande, M. (2014). Finite Element Method and Computational Structural Dynamics. Prentice Hall India Learning Private Limited.
2. Bhatti, M.A. (2005). Fundamental Finite Element Analysis and Applications: with Mathematica and Matlab Computations. John Wiley & Sons Inc.