INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (CIVIL ENGINEERING)**
SEMESTER	**5**
COURSE TITLE	**ANALYSIS OF STRUCTURE**
COURSE CODE	**09CI0511**
COURSE CREDITS	**3**

Objective:

1 To impart the principles of elastic structural analysis and behavior of indeterminate structures.

2 To impart knowledge about various methods involved in the analysis of indeterminate structures.

3 To apply these methods for analyzing the indeterminate structures to evaluate the response of structures.

4 To enable the student, get a feeling of how real-life structures behavior

Course Outcomes: After completion of this course, student will be able to:

1 Apply equilibrium equations and free-body diagrams to determine the support reactions and internal forces of determinate beams and frames.

2 Construct the axial force diagram, shear force diagram and bending moment diagram for determinate beams and frames;

3 Develop knowledge and skill in both moment distribution method.

4 Analyze long and short column under behavior of loading.

Pre-requisite of course: Applied Mechanics and Mechanics of Solid basics

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Structural Idealization** Structural representation and idealization of structural components, supports, connections and loadings, Differentiation of determinate and indeterminate structures, Application of equilibrium equations and free-body diagrams to solve support reactions of determinate structures	6

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Contents : Unit	Topics	Contact Hours
2	**Analysis of statically determinate beams with internal hinge** Analysis of determinate beam with/ without internal hinge, Description of the relationships between applied loadings, shear force and bending moment of beams, Construction of shear force and bending moment diagrams , Construction of the deflected shape of a beam under applied loadings	6
3	**Stress distribution of short columns** Differentiation of the behavior of short, intermediate and long columns , Analysis of the stress distribution of an eccentrically loaded short column , Explanation of the middle third rule and core of the section	6
4	**Structural behavior of long columns** Identification of the criteria of a long column , Evaluation of the effective length of a long column under different end restrained conditions , Application of the slenderness ratio and evaluation of the Euler buckling load and stress	6
Total Hours		**24**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Assignment 1** Structural Idealization (Theory and 10 examples)	6
2	**Assignment 2** Analysis of statically determinate beams with internal hinge (8 examples)	6
3	**Assignment 3** Stress distribution of short columns (8 examples)	6
4	**Assignment 4** Structural behavior of long columns (8 examples)	6
Total Hours		**24**

Textbook :

1 Advance Structural Analysis, Pandit and Gupta, Tata McGraw Hill, Pub. Co.Ltd ., 2018

2 Advance Structural Analysis, Structural Analysis Volume-I and Volume II, Bhavikatti S.S, 2015

References:

1 Structural Analysis Volume-I and Volume II, Structural Analysis Volume-I and Volume II, Bhavikatti S.S, Vikas Publications, 2015

2 Structural Analysis, Structural Analysis, Russell C. Hibbeler, Pearson, 2017

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	20.00	30.00	30.00	0.00	0.00

Instructional Method:

1. The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by blackboard, may also use any of the tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
2. The internal evaluation will be done based on continuous evaluation of students in the laboratory and classroom.
3. Practical examination will be conducted at the end of the semester for evaluation of the performance of students in the laboratory.
4. Students will use supplementary resources such as online videos, videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1. https://onlinecourses.nptel.ac.in/noc22_ce29/preview