

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Faculty of Engineering & Technology

CIVIL ENGINEERING Scheme of

Examination & Evaluation

Semester: Fifth

Subject Code	Course	Teaching Scheme (Clock Hours/ Week)					Evaluation Scheme								Duration of University Theory Exam (Hrs)
		Theory hrs/week	Tutorial hrs/week	Practical hrs/week	Total hrs/week	Credits	Assessment of Marks for Theory				Assessment of Marks for Practicals				
							College Assessment (CA)	University Exam	Total Marks	Min. Marks	Internal	External	Total Marks	Min. Marks	
BECVE501T	Structural Analysis -II	3	1		4	4	20	80	100	40					3
BECVE501P	Structural Analysis -II			2	2	1					25	25	50	25	
BECVE502T	Reinforced Cement Concrete (RCC) Structures	3	1		4	4	20	80	100	40					4
BECVE502P	Reinforced Cement Concrete (RCC) Structures			2	2	1					25	25	50	25	
BECVE503T	Fluid Mechanics -I	3	1		4	4	20	80	100	40					3
BECVE503P	Fluid Mechanics -I			2	2	1					25	25	50	25	
BECVE504T	Geotechnical Engineering -II	3	1		4	4	20	80	100	40					3
BECVE505T	Hydrology & Water Resources (HWR)	4			4	4	20	80	100	40					3
BECVE506P	Communicative English & Technical Writing			3	3	2					25	25	50	25	
Total		16	4	9	29	25	100	400	500		100	100	200		

Note: 1."Technical Writing" shall consist of detailed report on Summer Training- 1 (ST-1) underwent after 4th Semester.

2. Equal weightage shall be given to the components of "Communicative English" and "Technical Writing"

STRUCTURAL ANALYSIS –II

**BECVE501T Evaluation Scheme: (80/20) (L-3 Hrs/Week, T-1 Hr/Week); Total Credits- 4
Exam Duration: 3 hrs**

COURSE OUTCOMES: The students shall be able to

1. Apply the different methods of analysis of frames in practical problems
2. Formulation of stiffness matrix, transformation matrix, load matrix for various structural components for analysis purposes.
3. Understand the basics of finite element method in the analysis of structural components.
4. Understand the concepts related to structural dynamics.

Unit – I

Kani's Method applied to symmetrical and unsymmetrical frames with sway (Up to single bay Two storey)

Unit - II

Analysis of Continuous Beams & Simple Portal frames (sway and Non Sway) Using Moment Distribution.

Unit - III

Basic concept, Degree of Freedom, Basic concept of Direct Stiffness Method. Formulation of elemental/local stiffness matrix and global stiffness matrix for plane truss. Transformation Matrix, Assembly of Global/ Structural stiffness matrix up to (8x8). Member load matrix including lack of fit, temperature, Assembly of Global/ Structure load matrix, Solution to problems with maximum degree of freedom three.

Unit - IV

Formulation of element/local stiffness matrix and global stiffness matrix for beam members (without axial deformations) for continuous beams, Transformation matrix Assembly of global/ structural stiffness matrix, Member load matrix due to concentrated loads, uniformly distributed Loads, Assembly of global/ structure load matrix up to Three Elements. Solution to problems with maximum degree of freedom Three.

Unit – V

Formulation of element/ local stiffness matrix and global stiffness matrix for Plane frame members (without axial deformations), Transformation matrix Assembly of global/ structural stiffness matrix, Member load matrix due to concentrated loads, uniformly distributed Loads, temperature Moments Assembly of global/ structural load matrix.

Solution to Plane frame problems with maximum degree of freedom six inclined member problems

Unit - VI

Introduction to structural dynamics, D'Alembert principle, inertia force, equation of motion (free vibration), SDOF system, Damping, natural frequency, (MDOF (up to 3 DOF), mode shape and nodal frequency).

Introduction to finite Element method, basic concepts, discretization of structures, Rayleigh Ritz method for bar elements (prismatic/Non-prismatic) Displacement based bar elements (Prismatic/Non-prismatic)

REFERENCE BOOKS:

- 1. C K Wang, 'Intermediate Structural Analysis'**
- 2. S P Timoshenko, 'Theory of Structure'**
- 3. Jain, Jain Krishna, 'Plain & Reinforced Concrete Structures', Vol-II**
- 4. Rally and Dally, 'Experimental Stress Analysis'**

STRUCTURAL ANALYSIS –II

BECVE501P

Evaluation Scheme: (25-Internal/25-

External) (P – 2 Hrs/Week); Total Credit - 1

Student shall undertake Practicals on:

Minimum Eight Problems, on complete syllabus with hand calculations using scientific calculators and also solution to same problems by using available application software.

(Solution is restricted to four degree of freedom problems and assembly restricted to eight degree of freedom problems)