	SRI VIDYA COLLEGE OF ENGINEERING & TECHNOLOGY COURSE PLAN	Doc.Ref:SVCE02 Revision: 01 Date: 20.06.2018

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR: 2018-19

Subject Code	CE6501		L	P	T	C
Subject Title	STRUCTURAL ANALYSIS-I		3	0	1	4
Year / Dept / Sem	III/CIVIL/V	Regulation Year	2013			
Faculty Name / Desg / Dept	Mr.R.PANDIARAJAN/AP/CIVIL					
Course Prerequisite	1. Know the types of structures 2. Understanding in basic fundamentals of Mechanics of solids					

UNIT I INDETERMINATE FRAMES 9

Degree of static and kinematic indeterminacies for plane frames - analysis of indeterminate pin-jointed frames - rigid frames (Degree of statical indeterminacy up to two) - Energy and consistent deformation methods.

UNIT II MOVING LOADS AND INFLUENCE LINES 9

Influence lines for reactions in statically determinate structures –influence lines for member forces in pin-jointed frames –Influence lines for shear force and bending moment in beam sections – Calculation of critical stress resultants due to concentrated and distributed moving loads.

Muller Breslau"s–Influence linesprincipleforcontinuousbeams and single storey rigid frames – Indirect model analysis for influence lines of indeterminate structures –Beggs deformeter

UNIT III ARCHES 9

Arches as structural forms –Examples of arch structures –Types of arches –Analysis of three hinged, two hinged and fixed arches, parabolic and circular arches –Settlement and temperature effects.

UNIT IV SLOPE DEFLECTION METHOD 9

Continuous beams and rigid frames (with and without sway) –Symmetry and antisymmetry – Simplification for hinged end –Support displacements

UNIT V MOMENT DISTRIBUTION METHOD 9

Distribution and carryover of moments –Stiffness and carry over factors –Analysis of continuous beams –Plane rigid frames with and without sway –Neylor"s simplification.

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:

Students will be able to

- analysis trusses, frames and arches
- analyse structures for moving loads and
- will be conversant with classical methods of analysis.

TEXT BOOKS:

1. Vaidyanadhan, R. and Perumal, P. – CVolmprehensiv 1&Vol Laxmi Publications Pvt. Ltd, New Delhi, 2003.
2. L.S. Negi & R.S. Jangid, "Structural Analysis 6th Edition, 2003.
3. Punmia.B.C, Ashok Kumar Jain and Arun Kumar Jain, " Theory of structures", Laxmi Publications Pvt. Ltd., New Delhi, 2004
4. Reddy. C.S , "Basic Structural Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi 2013.
5. BhavaiKatti, S.S, "Structural Analysis –Vol. 1 & Vol. 2", Vikas Publishing Pvt Ltd., New Delhi, 2008

REFERENCES:

1. Wang C.K. , "Indeterminate Structural Analysis", Tata M New Delhi, 2010
2. Devadas Menon, "Structural Analysis", Narosa P
3. Ghali.A., Nebille and Brown. T.G., "Structural Analysis - A unified classical and matrix approach" Sixth Edition, SPON press, New York, 2013.
4. Gambhir. M.L., "Fundamentals of Structural Mechanics and Analysis"., PHI Learning Pvt Ltd., New Delhi, 2011.

Course Objectives (CO)	Students will be able to CO1: analyse trusses, frames and arches CO2: analyse structures for moving loads CO3: will be conversant with classical methods of analysis CO4: analyse trusses using influence line method CO5: analyse structures for wheel loads CO6: analyse about consistent deformation method
Expected Course Outcome (ECO)	At the end of the course, the students should be able to: ECO1: identify, formulate, and solve engineering problems ECO2: a recognition of the need for, and engage in lifelong learning ECO3: an understanding of professional and ethical responsibility communicate effectively ECO4: function on multidisciplinary teams

Programme Educational Objective (PEO)

Mapping of CO & PO(Specify the PO's) - *(Fill the Cells with the legend given below)*

Programme Outcomes of Civil Engineering

a. Graduates of Civil Engineering program will be able to apply the fundamental knowledge of mathematics, science and engineering to solve problems pertaining to Civil Engineering.
b. Graduates of Civil Engineering program will be able to identify, analyse, formulate, and solve civil Engineering problems in accordance with Indian Standard codes of practice.
c. Graduates of Civil Engineering program will be able to design a system component, or process to meet desired needs within realistic constraint such as economic, environmental, social, political,

ethical, health, safety, manufacturability, and sustainability

d. Graduates of Civil Engineering program will able be to design and conduct experiments, as well as to analyze and interpret data.
e. Graduates of Civil Engineering will be able to use the techniques, skills, and modern civil engineering tools, necessary for engineering practice.
f. Graduates of Civil Engineering program will be able to incorporate specific contemporary issues into the identification, formulation, and solution of specific civil engineering problems.
g. Graduates of Civil Engineering program will be able to work on the basis of broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
h. Graduates of Civil Engineering program will be able to understand the role of Civil Engineers and ethical responsibility.
i. Graduates of Civil Engineering program will be able to function on multidisciplinary teams.
j. Graduates of Civil Engineering program will be able to deliver effective verbal, written, and graphical communications.
k. Graduates of Civil Engineering program will be able to recognize the need for, and an ability to engage in life-long learning.

Graduates of Civil Engineering program will be able to perform economic analysis, quality checks, time/labour management and cost estimates related to design, construction, operations and maintenance of systems in the civil technical specialties.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	3	-	-	-	-	-	2	-	-	-	-
CO2	2	3	1	-	-	-	-	-	-	-	2	-
CO3	-	3	-	3	-	-	-	-	2	-	-	-
CO4	3	-	-	-	1	-	-	-	-	-	-	-
CO5	1	3	1	-	-	3	3	-	-	2	-	-
CO6	-	3	2	2	-	-	-	-	-	-	-	-

Bridging the Curriculum Gap (Additional Topics beyond syllabus / Seminars / Assignments)	BCG1: Method of Tension Coefficient BCG2:Advance methods about analysis of structures BCG3: Give the Problems on real site structures BCG4: seminars on Willot digrams
Related Website URLs	W1: freeit.free.fr/Knovel/.../31961_04.pdf W2: www.civil.iitb.ac.in/800-dir/Kalani_Book.pdf W3: https://en.wikipedia.org/wiki/**Moment_distribution_method** W4: https://en.wikipedia.org/wiki/**Slope_deflection_method**
Related Video Course Materials (min. 4 no.s)	V1: www.youtube.com/watch?v=GUOKSExdjq8 V2: www.youtube.com/watch?v=1P4fMETaa50

ACADEMIC YEAR: 2018-2019ODD REGULATION 2013

SUB CODE NAME : CE6501 STRUCTURAL ANALYSIS-I YEAR SEM: III/V

S.No	Topic Name	Book	Page no	Mode of delivery	No of hrs	Cumulative hrs
	UNIT I DEFLECTION OF DETERMINATE STRUCTURES					
1	Introduction About Principles of virtual method	T1	47	B.B	1	1
2	Determine the horizontal and vertical deflection of joint or support of the pin jointed frames	T1	55	B.B	2	3
3	Determine the horizontal and vertical deflection of joint or support of the rigid frames	T1	58	B.B	2	5
4	Determine the horizontal and vertical deflection of joint or support of the plane truss	T1	50	B.B	2	7
5	Determine the horizontal and vertical deflection of joint or support of the plane truss due to temperature changes	T1	51	B.B	1	8
6	Determine the horizontal and vertical deflection of joint or support of the rigid truss	T1	77	B.B	1	9
7	Tutorials	T1		B.B	3	12
	UNIT-II MOVING LOADS AND INFLUENCE LINES					
1	Introduction about influence lines	T1	103	B.B	1	13
2	Influence lines for reactions in statically determinate structures	T1	104	B.B	1	14
3	influence lines for members forces in pin-jointed frames	T1	106	B.B	1	15
4	Influence lines for shear force and bending moment in beam sections	T1	107	B.B	1	16
5	Calculation of critical stress resultants due to concentrated and distributed moving loads	T1	121	B.B	1	17
6	Muller Breslau's principle	T2	170	B.B	1	18
7	Influence lines for continuous beams	T2	172	B.B	1	19
8	influence lines of indeterminate structures(indirect model analysis)	T2	174	B.B	1	20
9	Influence lines for single storey rigid frames & Beggs deformeter	T2	176	B.B	1	21
10	Tutorials				3	24
	UNIT III ARCHES					
1	Introduction About Arches	T1	173	B.B	0.5	24.5
2	Types of arches	T1	174	B.B	0.5	25
3	Determine the reaction ,B.M, radial shear and normal thrust for 3 hinged parabolic arches	T1	188	B.B	0.5	25.5
4	Determine the reaction ,B M, radial shear and normal thrust for 3 hinged parabolic arches (different levels)	T1	196	B.B	1.5	27
5	Determine the reaction ,B.M, radial shear and normal thrust for 3 hinged circular arches	T1	198	B.B	1	28
6	Determine reaction ,B.M, radial shear and normal thrust for 2 hinged	T2	206	B.B	2	30

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Tutorials	[illegible]		B.B	3	[illegible]
UNIT IV SLOPE DEFLECTION METHOD						
1	Introduction About Slope deflection method	T2	2	B.B	1	37
2	Derive The Slope Deflection Equation	T2	3	B.B	1	38
3	Determine the bending moment and shear force for continuous beams without support yielding	T2	7	B.B	2	40
4	Determine the bending moment and shear force for continuous beams with support yielding	T2	13	B.B	2	42
5	Determine the bending moment and shear force for rigid frames without side sway	T2	20	B.B	2	44
6	Determine the bending moment and shear force for rigid frames with side sway	T2	29	B.B	1	45
7	Tutorials			B.B	3	48
UNIT V MOMENT DISTRIBUTION METHOD						
1	Introduction About Moment distribution method (hardy cross method)	T1	44	B.B	1	49
2	Determine the stiffness factor and distribution factor for various members in continuous beams without support sinks	T1	45	B.B	1	50
3	Determine the bending moment and shear force for continuous beams without support yielding	T1	48	B.B	1	51
4	Determine the bending moment and shear force for continuous beams with support yielding	T1	61	B.B	2	54
5	Determine the bending moment and shear force for rigid frames without side sway	T1	64	B.B	2	56
6	Determine the bending moment and shear force for rigid frames with side sway	T1	71	B.B	1	57
7	Tutorials			B.B	3	60

	Prepared by	*Approved by*
Signature		
Name	Mr.R.PANDIARAJAN	Mr.P.SURESHKUMAR
Designation	Assistant Professor Department of CIVIL	ASP & HOD/ CIVIL
Signed date	20.06.2018	20.06.18

METHODOLOGY TO MAP OBJECTIVE WITH OUTCOME

Course outcomes are achieved through

- **a.** Suitable Analogies.
- **b.** Class room teaching.
- **c.** Assignments.
- **d.** Tutorials
- **e.** Weekly, monthly and model exams.
- **f.** Brain storming.
- **g.** Group discussion and role play.
- **h.** Seminars.

| Endorsed |

| Prd |