Appendix - C

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT
Department of civil Engineering

Academic Year: **2016-17** Semester**: EVEN**

COURSE PLAN

Semester: **IV** Subject Code& Name: **15CV42 & ANALYSIS OF DETERMINATE STRUCTURES**

Name of Subject Teacher: **JEEVA JOTHI.G**

Name of Subject Expert (Reviewer): **KALYANI**

For the Period: From: 1-02-17 to 19-05-17

Details of Book to be referred:

Text Books	**TB 1:** Reddy C S, Basic Structural Analysis, Tata McGraw Hill, New Delhi. **TB 2:** Muthu K U. etal, Basic Structural Analysis, 2ND edition, IK International Pvt. Ltd., New Delhi, 2015. **TB 3:** Bhavikatti, Structual Analysis, Vikas Publishing House Pvt. Ltd, New Delhi, 2002.
Reference Books	**RB 1:** Hibbeler R C, Structural Analysis, Prentice Hall, 9 edition, 2014 **RB 2:** Prakash Rao D S, Structural Analysis, University Press Pvt. Ltd, 2007

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	**MODULE 1:** Introduction to the subject	**Objective:** To study the equilibrium conditions and to analyze whether a structure is statically determinate or not. **Application:** It can be applied in the analysis of trusses, beams and any structural member. **OUTCOME:** Students will be able to know the concept of analysis of trusses and equilibrium conditions		06/02/2017				
2.	Structural forms and Conditions of equilibrium		**T1: 1.1-1.4**	06/02/2017				
3.	Compatibility Conditions and Degree of freedom		**T1: 3.1-3.2 & 13.2-13.4**	07/02/2017				
4.	Linear and non linear analysis .		**T1: 3.4-3.5**	09/02/2017				
5.	Static and kinematic indeterminacies of structural systems		**T1: 3.5**	10/02/2017				
6.	Definition of truss and Types of trusses. Assumptions in analysis		**T1: 3.5-3.6**	10/02/2017				
7.	Analysis of determinate trusses by method of joints		**T1: 6.1-6.4**	13/02/2017				
8.	Problems on Analysis of determinate trusses by method of joints		**T1: 6.5-6.14**	13/02/2017				
9.	Problems on Analysis of determinate trusses by method of joints		**T1: 7.1-8.7**	14/02/2017				

10.	Problems on Analysis of determinate trusses by method of joints		**T1: 9.1-9.7**	16/02/2017				
11.	Analysis of determinate trusses by method of joints.		**T1: 10.1-10.3**	17/02/2017				
12.	Problems on Analysis of Determinate trusses by method of sections.		**T1: 11.1-11.2**	17/02/2017				
13.	Problems on Analysis of Determinate trusses by method of sections.		**T1: 11.3-11.4**	20/02/2017				
14.	Problems on Analysis of Determinate trusses by method of sections.		**T1: 22.4**	21/02/2017				
15.	Problems on Analysis of Determinate trusses by method of sections.		**T1: 5.1-5.3**	23/02/2017				
16.	**MODULE 2:** Definition of slope, Deflection and curvature, Sign conventions,	**Objective:** To understand the concept of slope and deflection. To analyze the beam with different loading cases. To analyze structural systems and interpret data.	**T1: 15.1**	27/02/2017				
17.	Derivation of moment-curvature equation.		**T1: 15.5**	27/02/2017				
18.	Double integration method and Macaulay's method: Slope and deflection for standard loading cases.		**T1: 15.3-15.4**	28/02/2017				
19.	Slope and deflection for determinate prismatic beams subjected to point load.		**T1: 15.3-15.4**	02/03/2017				

20.	Slope and deflection for determinate prismatic beams subjected to point UDL.	To Apply knowledge of mathematics and engineering in calculating slope and deflections **Application:** Evaluate the deflection of cantilever, simply supported and overhanging beams by different Methods. **OUTCOME:** Students will be able to analyze any type of determinate structures after the completion of this unit	**T1: 15.6-15.8**	03/03/2017				
21.	Slope and deflection for standard loading cases for UVL and couple.		**T1: 15.2**	03/03/2017				
22.	Moment area method: Derivation of MAM.		**T1: 15.5**	06/03/2017				
23.	Mohr's theorems.		**T3:Pg 374-395**	06/03/2017				
24.	Sign conventions, Application of moment area method for determinate prismatic beams.		**T3:Pg 129-149**	07/03/2017				
25.	Sign conventions and Application of moment area method for determinate Beams of varying section		**T3:Pg 109-119**	13/03/2017				
26.	Use of moment diagram by parts.		**T3:Pg 164-173**	13/03/2017				
27.	Conjugate beam method: Real beam and conjugate beam.		**T3:Pg 170-172**	14/03/2017				
28.	Conjugate beam theorems		**T3:Pg 166-168**	16/03/2017				
29.	Application of conjugate beam method of determinate beams of variable cross sections.			17/03/2017				
30.	**MODULE 3:** **Energy Principles and Energy Theorems**	**Objective:** To study about virtual work and virtual forces.	**T3: Pg 213-217 & 257-260**	20/03/2017				

	Principle of virtual displacements and Principle of virtual forces.	To study the Stress and strain behavior of the structures due to axial forces. To study about the deflection of beams. **Application:** Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and bent frames. **OUTCOME:** Students will be able to estimate the bent frames and thorough with the concepts of stress, strain and shear. Deflection of trusses is analyzed well in advance which reduces the probability of collapse in trusses.						
31.	Strain energy and complimentary energy.		**T3: Pg 229-217**	20/03/2017				
32.	Strain energy due to axial force, bending, shear and torsion.		**T3: Pg 229-217**	21/03/2017				
33.	Deflection of determinate beams and trusses using total strain energy.		**T3: Pg 321-333**	23/03/2017				
34.	Deflection of determinate beams and trusses using total strain energy.		**T3: Pg 268-275**	24/03/2017				
35.	Deflection at the point of application of single load.		**T2: Pg 282-285 & 364-377**	27/03/2017				
36.	Deflection at the point of application of single load and numerical based on it.		**T4: Pg 385-396**	27/03/2017				
37.	Castigliano's theorems and its application to estimate the deflections of trusses		**T1: Pg 324-325 & 329-334**	28/03/2017				
38.	Castigliano's theorems and its application to estimate the deflections of trusses		**T2: Pg 334-337**	30/03/2017				
39.	To estimate bent frames and Special applications of Dummy unit load method.		**T3: Pg 4-14**	31/03/2017				

40.	**MODULE 4:** **Arches and Cable Structures** Three hinged parabolic arches with supports at the same levels.	**Objective:** To determine the thrust and shear of parabolic arch. To determine the bending of cables under various loading conditions. **Application:** Analysis of arches and cables which is determinate under any load condition can be made using any of method taught in this unit. **OUTCOME:** Students will be able to determine the stress resultants in arches and cables.	**T2: Pg 44-53**	31/03/2017				
41.	Three hinged parabolic arches with supports at the different levels.		**T1: Pg 33-44**	03/04/2017				
42.	Determination of normal thrust.		**T1: Pg 60-102**	03/04/2017				
43.	Determination of normal thrust.		**T1: Pg 62**	04/04/2017				
44.	Determination of radial shear		**T1: Pg 65**	06/04/2017				
45.	Determination of radial shear		**T1: Pg 66**	07/04/2017				
46.	Determination of bending moment.		**T2: Pg 152-164**	07/04/2017				
47.	Determination of bending moment.		**T2: Pg 114-119**	10/04/2017				
48.	Analysis of cables under point loads.		**T2: Pg 132-133**	10/04/2017				
49.	Analysis of cables under UDL.		**T4: Pg 180-182**	11/04/2017				
50.	Analysis of cables under UDL.		**T2: Pg 176-180**	13/04/2017				
51.	Length of cables for supports at same level.		**T1: 16.1-16.4 & 16.6**	20/04/2017				
52.	Length of cables for supports at different level.		**T1: 16.7-16.8**	21/04/2017				

53.	Stiffening trusses for suspension cables.		**T1: 16.5-16.6**	21/04/2017				
54.	**MODULE 5:** **Influence Lines and Moving Loads** Concepts of influence lines	**Objective:** To Understand the concept of influence lines and construct the ILD diagram for the moving loads. **Application:** Arches and cables help to connect two land masses. **OUTCOME:** Students will be able to know the difference between determinate and indeterminate structures. And also the concepts of shear force and bending moment.	**T1: 17.1-17.3**	24/04/2017				
55.	ILD for reactions.		**T1: 18.8 & 20.1-20.13**	24/04/2017				
56.	SF and BM for determinate beams		**T1: 19.1-19.16**	25/04/2017				
57.	SF and BM for determinate beams		**T1: 18.9&24.1**	27/04/2017				
58.	SF and BM for determinate beams		**T3: Pg 173-186**	28/04/2017				
59.	ILD for axial forces in determinate trusses Reactions.		**T3: Pg 187-193 &**	02/05/2017				
60.	ILD for axial forces in determinate trusses Reactions.		**T3: Pg 231-237& 238-242**	04/05/2017				
61.	BM in determinate beams using rolling loads concepts.		**T3: Pg 237-238&242-244**	05/05/2017				
62.	BM in determinate beams using rolling loads concepts.		**T3: Pg 406-414**	08/05/2017				
63.	SF in determinate beams using rolling loads concepts. Numerical based on it.		**T3: Pg 414-422 & 432-437**	09/05/2017				
64.	Numerical			11/05/2017				

65.	SF in determinate beams using rolling loads concepts.		**T3: Pg 414-422**	12/05/2017				
66.	Numerical			12/05/2017				
67.	Revision 1	Solving VTU Question Paper		15/05/2017				
68.	Revision 2			18/05/2017				
69.	Revision 3			19/05/2017				

Prepared By:_____
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