SILVER OAK UNIVERSITY

Engineering and Technology (M.Tech.)

Civil Engineering (Computer Aided Structural Analysis & Design)
Subject Name: Bridge Structures
Subject Code:
Semester: II

Prerequisite: Design of Structures, Design of Reinforced concrete structures

Objective: At the end of this course the student shall be able to choose appropriate bridge structure and design it for given site conditions.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Evaluation Scheme				Total Marks
				Internal		External		
L	T	P	C	Th	Pr	Th	Pr	
3	2	0	4	40	20	60	30	150

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1.	Classification, investigations and planning, choice of type of bridges	4	05
2.	I.R.C. and other international live load specifications for road bridges, Various forces acting on bridges	8	20
3.	Load distribution theories: Courbon's Method, Hendry Jaeger Method, Grillage analogy, Pigeaud's curves.	9	25
4.	**Superstructure:** General design considerations, analysis and design of reinforced concrete slab culverts, tee beam and slab bridges, Design principles of prestressed bridges, continuous bridges, box girder bridges, balanced cantilever bridges.	9	25
5.	**Substructure :** Various parts of substructures, Various types of substructures, Loads acting on substructures, Design of pier and pier cap, Design of piles, Design of wells and sinking of wells	9	25

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	Understand the load distribution and IRC standards.	1,2,3
CO-2	Design the slab and T beam bridges.	3,4
CO-3	Design Box culvert, pipe culvert, use bearings, hinges and expansion joints	4
CO-4	Design Piers and abutments.	5

Teaching & Learning Methodology:-

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

List of Experiments:

- **NIL**

Books Recommended:-

1. Raina V.K. "Concrete Bridge Practice" , Tata McGraw Hill Publishing Company, New Delhi, 1991.
2. Krishnaraju, N., "Design of Bridges" Oxford and IBH Publishing Co., Bombay, Calcutta, New Delhi, 1988
3. Bakht, B. and Jaegar, L.G., "Bridge Analysis simplified", McGraw Hill, 1985.
4. Ponnuswamy, S., "Bridge Engineering", Tata McGraw Hill, 1989
5. Derrick Beckett, "An introduction to Structural Design of Concrete Bridges", Surrey University Press, Henley Thomes, Oxford Shire, 1973.
6. Taylor, F.W., Thomson, S.E., and Smulski E., "Reinforced Concrete Bridges", John Wiley and Sons, New York, 1955.
7. Edwin H.Gaylord Jr., Charles N.Gaylord, James, E.,Stallmeyer "Design of Steel Structures" McGrew Hill International Editions, 1992.

List of Open Source Software/learning website:

•https://nptel.ac.in/courses/105/105/105105165/