SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology
Civil Engineering

B. Tech. III Semester VI

Subject Name : Computer Aided Structural Detailing **Subject Code:** BTCL14602
Type of course : PEC - II
Prerequisite : Basic Concrete Design (BTCL13502)
Rationale : Any Structural Design Subject has two major components – Design Calculations and Drawings/Detailing based on Calculations. Generally, more emphasis is given to calculation part whereas drawing component remains less attended. In field, all executions are done based on drawings / detailing and mistake in detailing / drawings lead to mistakes in construction which may consequently lead to failure of structures. This subject exclusively focuses on detailing part of Structural Design subjects wherein students will be exposed to detailing of Concrete and Steel Structures.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
3	0	2	4	60	25	15	30	20	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	**Introduction:** Grades of Concrete, Grade of Steel, General Notes, Standard Notes, Notations, Scale, Drawings Sheet Size, Drawing Template, Legal Importance of Notes and Drawing Detailing	5	20%

2.	**RCC:** Beam – Simply Supported, Continuous Beam, Cantilever Beam, Slab – One Way, Two Way, Cantilever, Continuous Slab, Column – Axially Loaded, Column with Uniaxial Bending, Column with Biaxial Bending, Stair – Doglegged & Folded, Retaining Wall – Cantilever & Counterfort, Type Water Tank – Square/Rectangular Plan Shape, Circular Plan Shape	20	40%
3.	**STEEL:** Connections – Beam to Beam, Beam to Column / Bolted & Welded, Beam – Bolted and Welded, Column – Battened & Laced Built-Up Columns, Stair – Doglegged, Column Base – Slab Base and Gusseted Base, Roof Truss – Bolted & Welded, Gantry Girder	20	40%

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	**20**	**20**	**15**	**15**	**20**

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	**Title of book /article**	**Author(s)**	**Publisher and details like ISBN**	**Year of Publication**	**Publication Edition**
01	Structural Detailing in Concrete	M. Y. H. Bangash	Wiley–Blackwell 978-0632028535	1992	--
02	Structural detailing in steel	M. Y. H. Bangash	Thomas Telford Publishing 0 7277 2850 4	2000	--
03	Manual for Detailing of Steel Structures	S. Kanthimathinathan	Dreamtech Press 978-9389307757	2019	--
04	Design of Reinforced Concrete Structures	P. Dayaratnam	Medtech 978-9386479785	2017	5th

05	Reinforced Concrete Design	Devdas Menon	McGraw Hill Education 978-0070141100	2017	3rd
06	Design of Reinforced Concrete Structures	N. Subramanian	Oxford 978-0198086949	2013	1st
07	Design of Reinforced Concrete Structures	N. Krishna Raju	CBS 978-9385915369	2019	4th
08	Design and Drawing of Steel Structures	S. S. Bhavikatti	Dreamtech Press 978-9389520460	2019	1st
09	Design of Steel Structures	N. Subramanian	Oxford University Press	2018	1st
10	Design of Steel Structures	P. Dayaratnam	S Chand Publishing 978-8121923200	2012	1st
11	SP 34: Handbook on Concrete Reinforcement and Detailing, Bureau of Indian Standards				
12	IS 13920:2016, Ductile Design and Detailing of Reinforced Concrete Structures Subjected to Seismic Forces - Code Of Practice, Bureau of Indian Standard				

Course Outcome:

Sr. No.	CO Statement **After learning this subject, students will be able to**	Marks % weightage
CO-1	Visualize the importance of drawings/detailing on Site *(R, U, A - Cognitive level)*	15
CO-2	Demonstrate Behavior of Structural Elements under the actions of loads *(R, U, A - Cognitive level)*	15
CO-3	Prepare detail drawings of RCC Structures *(U, A, N, E, C - Cognitive level)*	30
CO-4	Prepare detail drawings of Steel Structures *(U, A, N, E, C - Cognitive level)*	30

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	3	-	-	2	3	1	1	3	1	3	-	3	3	2	1
CO-2	3	2	-	2	3	1	1	3	1	3	-	3	3	2	1
CO-3	3	2	-	2	3	1	1	3	1	3	-	3	3	2	1

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CO-4	3	2	-	2	3	1	1	3	1	3	-	3	3	2	1
Rationale*	12	6	-	8	12	4	4	12	4	12	-	12	12	8	4

Rationale*: Most of the POs are matching with CO's. The most important outcome of the subject is to develop technically sound drawings which will further help the contractors for developing structures on site accurately.

LIST OF PRACTICALS:

- Students have to prepare individually sketch book based on RCC Structures and Steel Structures
- To prepare Portfolio containing Computer Aided Structural Drawings based on Sketchbook Prepared

List of Open Source/learning website:

- https://www.youtube.com/watch?v=eZ-iWeagWqg
  - Detailing of RCC Building
- https://www.youtube.com/watch?v=FPPr7G1Xmr0
  - Detailing of STEEL Building

List of Open-Source Software:

- AutoCAD