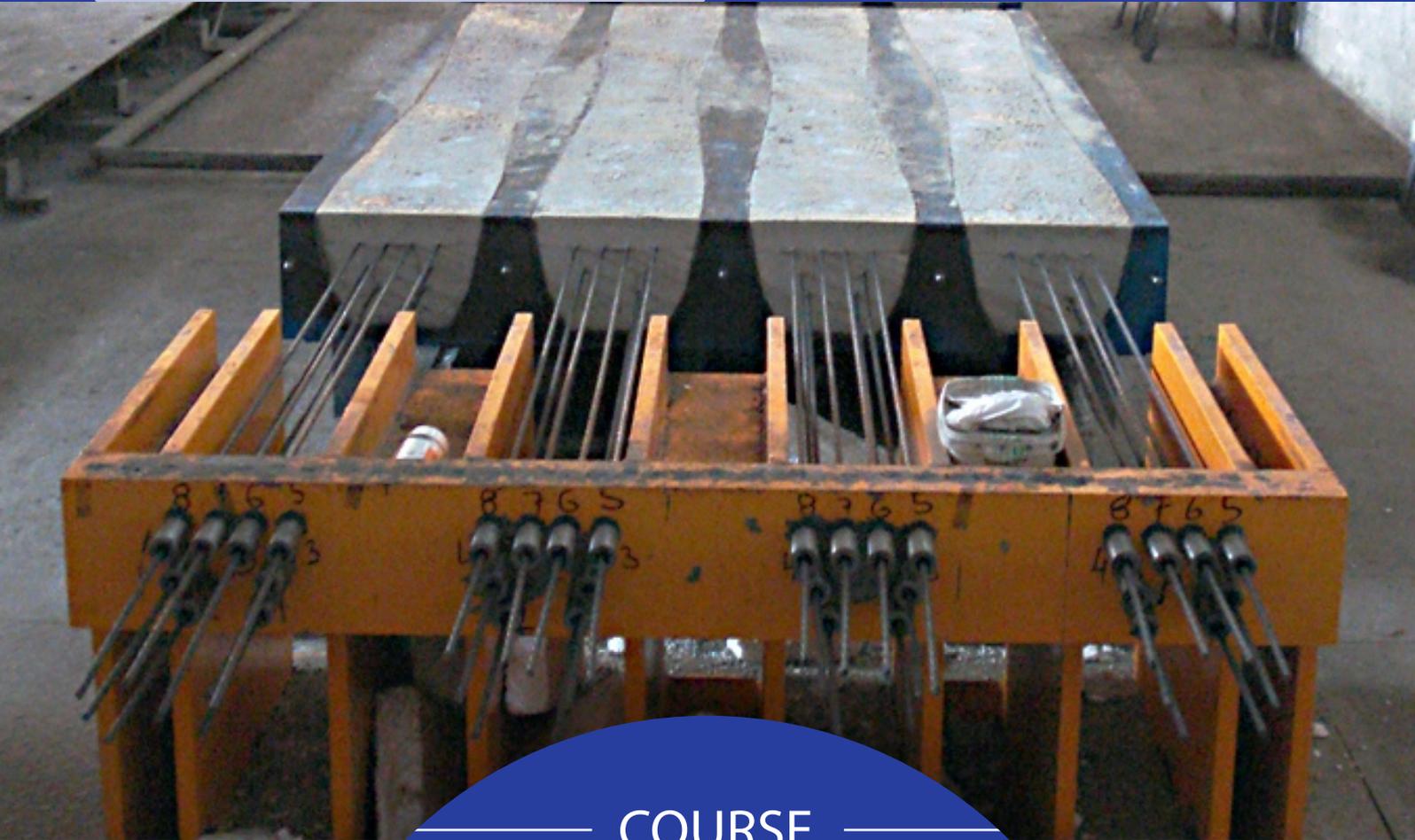




SHARDA
UNIVERSITY
Beyond Boundaries



**SHARDA SCHOOL OF
ENGINEERING &
SCIENCE**



COURSE

**DESIGN OF
PRESTRESSED
STRUCTURES
(NV35003)**

VALUE ADDED
COURSE BROCHURE-30 HRS
2025-26

ABOUT THE UNIVERSITY

Sharda University is a leading Educational institution based out of Greater Noida, Delhi NCR. A venture of the renowned Sharda Group of Institutions (SGI), The University has established itself as a high quality education provider with prime focus on holistic learning and imbuing competitive abilities in students.

ABOUT SCHOOL

Sharda School of Engineering and technology is an open platform for diverse voices where teaching runs parallel to the real world and students are groomed to join the global workforce. SSET is distinguished as one of the top-ranked engineering schools in India. The students at SSET benefit through the professional grooming of renowned faculty and industry experts having experience of tackling pressing engineering problems. Students discover their passion in one of the various offered Engineering majors at the School of Engineering and technology. A student-centric pedagogy, project-based approach and design-driven curriculum provide students with an inclination for complex problem solving, design, innovation, and a passion for learning. The mission of the School of Engineering and technology through its various programmes are to educate well-integrated individuals who possess technical and social competence to succeed in professional arenas and design solutions for global problems.

ABOUT DEPARTMENT

Department of Civil Engineering (CE) is one of the premier departments of School of Engineering and Technology, Sharda University. The department offers B.Tech, M.Tech and Ph.D. Programmes. The department has people of eminence from academia as well as industry, who have exposure to future cutting – edge research programs in the field of Hydraulics, Environmental Engineering, Geotechnical Engineering, Structural Engineering, Transportation Engineering, Geodesy & Mapping, Geographic Information System & Remote Sensing and Global Positioning Systems.

ABOUT COURSE

DESIGN OF PRESTRESSED STRUCTURES

This course aims to equip students with comprehensive knowledge and practical skills in the design and analysis of prestressed concrete structures. The course covers fundamental concepts including introduction to prestress, various systems of prestressing, elastic analysis of prestressed members, calculation of losses in prestress, and advanced design methodologies for flexure, shear, and torsion. Students will gain hands-on experience in analyzing and designing both pre-tensioned and post-tensioned concrete members following IS code recommendations, preparing them for real-world structural engineering challenges.

Course Schedule

Week	Topic	Duration Hrs.
1	Introduction to prestressed concrete, Materials, methods and systems of prestressing	3
2	Indian Standard recommendations, Elastic analysis of prestressed concrete beams with different cable profiles	3
3	Losses in Prestress: Loss in pre-tensioned members	3
4	Loss in post-tensioned members, Combined losses and total loss	3
5	Design for Flexure: Pressure Line Concept	3
6	Elastic design of pre-tensioned and post-tensioned beams for flexure	3
7	Design for Shear: IS code recommendations	3
8	Elastic design of pre-tensioned and post-tensioned beams for shear	3
9	Design for Torsion: IS code recommendations	3
10	Elastic design of pre-tensioned and post-tensioned beams for torsion	3

RESOURCE PERSON

Ms. Sphurty Raman

Ms. Sphurty Raman is presently working as an Assistant Professor in the Department of Civil Engineering at Sharda School of Engineering & Science, Sharda University. She brings diverse industry and academic experience, having worked for 2 years at Shailendra Sharma and Architects firm focusing on MPBDC projects, and 1.5 years with a construction firm in Indore. She has submitted her Ph.D. thesis in Structural Engineering from NIT Bhopal with a CGPA of 8.81, and completed her M.Tech in Structural Engineering from NIT Bhopal with First Division Honours (CGPA 8.55). She has published multiple research papers in high-impact SCIE-indexed international journals, SCOPUS-indexed book chapters, and conference proceedings. Her research expertise includes sustainable construction materials, concrete technology, statistical optimization using Taguchi method and ANOVA, and AI/ML applications in civil engineering. She is proficient in STAAD Pro, AutoCAD, and has completed professional certifications in AI applications for civil engineering.

CO and PO Mapping

COS↑ Pos→	Po1	Po2	Po3	Po4	Po5	Po6	Po7	Po8	Po9	Po10	Po11	Po12
Co1	3	3	1	2	1	-	-	-	-	-	-	2
CO2	3	3	2	2	1	-	-	-	-	-	-	2
CO3	3	2	3	2	2	-	1	-	-	-	1	2
CO4	3	2	3	2	2	-	1	-	-	-	1	2
CO5	3	2	3	2	2	-	1	-	-	-	1	2
Co6	3	3	3	2	2	1	1	2	-	-	1	2

School : SSES
 Programme : B. Tech
 Branch : CE

Batch: 2023-2027
 Current Academic Year: 2025-26
 Semester: VI

1. Course Code	NV35003	
2. Course Title	Design of Prestressed Structures	
3. Credits	Audit	
4. Contact Hours (L-T-P)	30 Hours	
Course Type	Value added course	
5. Course Objective	The objective of this Course is to provide knowledge with more advanced coverage of various topics relating to the design of prestressed concrete structures. The course will enhance the knowledge of various design methods and behaviour of material in different conditions.	
6. Course Outcomes	The student will be able to: CO1: Analyze prestressed members. CO2: Analyze prestressed members for flexure. CO3: Design Prestressed concrete members for flexure CO4: Design Prestressed concrete members for shear. CO5: Design Prestressed concrete members for torsion. CO6: Analyze and Design Prestressed members as per IS code recommendations.	
7. Course Description	Introduction to prestress, systems of prestressing, elastic analysis, losses, design for flexure, shear and torsion.	
8. Outline syllabus		Duration Hours
Unit 1	Introduction to prestressed concrete	
A	Materials, methods and systems of prestressing	CO1,CO6
B	Indian Standard recommendations.	
C	Elastic analysis of prestressed concrete beams with different cable profiles.	
Unit 2	Losses in Prestress	
A	Loss in pre-tensioned members	CO2,CO6
B	Loss in post-tensioned members.	
C	Combined losses and total loss for pre-tensioned and post-tensioned sections.	
Unit 3	Design for Flexure	
A	Pressure Line Concept	CO3,CO6
B	Elastic design of pre-tensioned beams for flexure	
C	Elastic design of post-tensioned beams for flexure	
Unit 4	Design for Shear	
A	IS code recommendations	CO4,CO6
B	Elastic design of pre-tensioned for shear	
C	Elastic design of post-tensioned beams for shear	
Unit 5	Design for Torsion	
A	IS code recommendations	CO5,CO6
B	Elastic design of pre-tensioned for torsion.	
C	Elastic design of post-tensioned beams for torsion.	
Mode of Examination	VIVA/PROJECT	
Text book/s*	1. Krishna Raju, N., "Prestressed Concrete," Tata McGraw-Hill Publishing Company Limited, 2012.	
Other References	1. Rajagopalan, N., "Prestressed Concrete," Narosa publishing house, 2013. 2. Indian standard on "CODE OF PRACTICE FOR PRESTRESSED CONCRETE," Bureau of Indian Standard, 2003 – IS 1343:2012.	