LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY

(UGC Autonomous)

Approved by AICTE | Affiliated to Osmania University | Estd.2003.

Department of Civil Engineering

Course Outcomes & Course Articulation Matrix

ACADEMIC YEAR: 2025-26

Course Outcomes:

Semester No:	IV		
Course Title:	English For Technical Communication (ETC)	**Course Code:**	**U24EN401**
Course Outcome No.	**Description**		
ETC.CO1	Apply technical communication skills effectively.		
ETC.CO2	Adapt different types of official correspondence successfully.		
ETC.CO3	Construct report writing productively using various techniques.		
ETC.CO4	Develop the skills of manual writing adequately.		
ETC.CO5	Interpret the information transfer from verbal to non-verbal data and vice-versa completely.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
ETC.CO1	1							2	3		3		
ETC.CO2						2	1	2	3	1	3		
ETC.CO3				3		1		2	3			1	1
ETC.CO4								2	3				
ETC.CO5				1				2	3		3	2	
Average	1			2		1.5	1	2	3	**1**	3	1.5	1

Course Outcomes:

Semester No:	IV		
Course Title:	Business Economics and Financial Analysis (BEFA)	**Course Code:**	**U24MB401**
Course Outcome No.	**Description**		
BEFA.CO1	Apply the concept of Business and Economics during his professional and personal life		
BEFA.CO2	Understand the elasticity of the demand of the product, different types, and measurement of elasticity of demand and factors influencing on elasticity of demand		
BEFA.CO3	Recognize the Production function, features of Iso-Quants and Iso-Costs, different types of internal economics, external economics and law of returns with appropriate examples.		
BEFA.CO4	Prepare the financial statements of the firm		
BEFA.CO5	Analyze the financial statements using ratio analysis and cash flow techniques.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
BEFA.CO1	3	1	1	1	-	-	1	2	3	2	-	2	1
BEFA.CO2	3	1	1	1	-	-	1	2	3	3	1	2	2
BEFA.CO3	3	2	2	2	-	-	1	2	3	3	2	2	3
BEFA.CO4	3	3	3	3	-	-	-	2	3	1	3	2	3
BEFA.CO5	3	3	3	3	-	-	-	2	3	1	3	2	3
Average	**3**	**2**	**2**	**2**	**-**	**-**	**0.6**	**2**	**3**	**2**	**1.8**	**2**	**2.2**

Course Outcomes:

Semester No:	IV		
Course Title:	Surveying and Geomatics (S&G)	**Course Code:**	**U24CE401**
Course Outcome No.	**Description**		
S&G.CO1	Understand the basic principles of Surveying and Instrumentation		
S&G.CO2	Computation of lengths, areas, bearings of given field work		
S&G.CO3	Apply the basic working principles of theodolite and total station		
S&G.CO4	Analyse Photogrammetry, remote sensing and determine the deflections of horizontal and vertical curves by using various methods		
S&G.CO5	Application of EDM & GPS of Surveying by various Methods		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
S&G.CO1	3	2	1	1	2					2		3	2
S&G.CO2	3	3	2	2	3					1		3	2
S&G.CO3	3	2	3	2	3				1	2		3	3
S&G.CO4	3	3	3	3	3					2		3	3
S&G.CO5	3	2	3	3	3					2		3	3
Average	**3**	**2.4**	**2.4**	**2.2**	**2.8**				**1**	**1.8**		**3**	**2.6**

Course Outcomes:

Semester No:	IV		
Course Title:	Strength of Materials-II (SM-II)	**Course Code:**	**U24CE402**
Course Outcome No.	**Description**		
SM-II.CO1	Recall and explain different methods for determining the slope and deflection of beams.		
SM-II.CO2	Illustrate shear force and bending moment diagrams for propped cantilever, fixed, and continuous beams.		
SM-II CO3	Apply Euler's and Rankine's theories to analyze column stability under various loading conditions.		
SM-II.CO4	Analyze deflections in beams, frames, and trusses using energy methods such as Castigliano's theorem and the unit load method.		
SM-II.CO5	Evaluate stresses in beams subjected to unsymmetrical bending and determine the shear center for different cross-sections.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
SM-II.CO1	3	2		3		1				1		2	
SM-II.CO2	3	3	2	2		1							2
SM-II CO3	3	3		3	2		1					2	
SM-II.CO4	3	3		3			1		2				3
SM-II.CO5	3	2		3	3	1						3	
Average	**3.0**	**2.6**	**2.0**	**2.8**	**2.5**	**1.0**	**1.0**	**-**	**2.0**	**1.0**	**-**	**2.33**	**2.5**

Course Outcomes:

Semester No:	IV		
Course Title:	Hydraulic Engineering (HE)	**Course Code:**	**U24CE403**
Course Outcome No.	**Description**		
HE.CO1	Compute velocity, specific energy and critical depth in steady uniform flow through open channels		
HE.CO2	Determine water surface profiles, hydraulic jumps and surges in non-uniform flow		
HE. CO3	Explain boundary layer growth, separation and evaluate drag and lift forces		
HE.CO4	Evaluate performance characteristics and design of hydraulic turbines		
HE.CO5	Evaluate performance characteristics and design of centrifugal pumps		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
HE.CO1	3	2	–	–	–	–	–	–	–	–	–	2	1
HE.CO2	3	3	2	2	–	–	–	–	–	–	–	3	2
HE. CO3	3	3	–	2	–	–	–	–	–	–	–	2	2
HE.CO4	3	3	3	2	2	–	–	–	–	–	–	3	3
HE.CO5	3	3	3	2	2	–	–	–	–	–	–	3	3
Average	**3.0**	**2.8**	**2.7**	**2.0**	**2.0**	**–**	**–**	**–**	**–**	**–**	**–**	**2.6**	**2.2**

Course Outcomes:

Semester No:	IV		
Course Title:	Transportation Engineering (TE)	**Course Code:**	**U24CE404**
Course Outcome No.	**Description**		
TE.CO1	Understand the history of highway development, surveys and classification of roads.		
TE.CO2	Understand and apply principles of geometric design of highways.		
TE. CO3	Analyze flexible pavement materials and design methods		
TE.CO4	Analyze rigid pavement stresses, design methods and overlay techniques		
TE.CO5	Understand railway engineering components, functions and track requirements.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
TE.CO1	3	2	-	-	-	-	1	-	-	-	-	2	1
TE.CO2	3	3	2	2	-	-	-	-	-	-	-	3	2
TE. CO3	3	3	2	2	2	-	-	-	-	-	-	3	3
TE.CO4	3	3	2	3	2	-	-	-	-	-	-	3	3
TE.CO5	2	2	-	-	-	-	1	-	-	-	-	2	1
Average	**2.8**	**2.6**	**2.0**	**2.3**	**2.0**	**-**	**1.0**	**-**	**-**	**-**	**-**	**2.6**	**2.0**

Course Outcomes:

Semester No:	IV		
Course Title:	Surveying and Geomatics Lab (S&G Lab)	**Course Code:**	**U24CE4L1**
Course Outcome No.	**Description**		
S&G Lab.CO1	Compute lengths, areas and bearings of the given field work.		
S&G Lab.CO2	Understand the basic working principles of theodolite and total station		
S&G Lab. CO3	Compute setting out data for setting out of horizontal curves by various methods		
S&G Lab.CO4	Computation of setting out data for horizontal and vertical curves by various methods		
S&G Lab.CO5	Analyze the basic concepts related to Photogrammetry, RS and GPS		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
S&G Lab.CO1	3	2		2					2			3	2
S&G Lab.CO2	2	2			2							2	2
S&G Lab. CO3	3	3		2					2			2	2
S&G Lab.CO4	3	3		3					2			2	2
S&G Lab.CO5	2	2			2							2	2
Average	**2.6**	**2.4**		**2.3**	**2**				**2**			**2.2**	**2**

Course Outcomes:

Semester No:	IV		
Course Title:	Hydraulics and Hydraulic Machinery Lab (HHM Lab)	**Course Code:**	**U24CE4L2**
Course Outcome No.	**Description**		
HHM Lab.CO1	Understand flow phenomena in open channels through experiments		
HHM Lab.CO2	Analyze forces due to jets and apply concepts to hydraulic machines		
HHM Lab. CO3	Understand working principles of hydraulic pumps and turbines		
HHM Lab.CO4	Interpret experimental results obtained from laboratory experiments		
HHM Lab.CO5	Acquire knowledge of hydraulic machinery and prepare technical lab reports		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
HHM Lab.CO1	2	1	–	–	–	–	–	–	–	–	–	2	1
HHM Lab.CO2	3	3	2	2	2	–	–	–	–	–	–	3	3
HHM Lab. CO3	2	2	–	–	–	–	–	–	–	–	–	2	1
HHM Lab.CO4	3	3	–	2	2	–	–	–	–	–	–	3	2
HHM Lab.CO5	2	1	–	–	–	–	–	–	2	–	1	2	1
Average	**2.4**	**2.0**	**2.0**	**2.0**	**2.0**	**–**	**–**	**–**	**2.0**	**–**	**1.0**	**2.4**	**1.6**

Course Outcomes:

Semester No:	IV		
Course Title:	Transportation Engineering Lab (TE Lab)	**Course Code:**	**U24CE4L3**
Course Outcome No.	**Description**		
TE Lab.CO1	Understand the characteristics of coarse aggregates used in pavements by performing basic tests.		
TE Lab.CO2	Understand the characteristics of bitumen by performing standard laboratory tests.		
TE Lab. CO3	Collect traffic data by conducting traffic volume studies at road sections and intersections		
TE Lab.CO4	Analyze traffic flow characteristics using collected traffic data.		
TE Lab.CO5	Select suitable software/tools to analyze level of service and traffic delays during peak hours.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
TE Lab.CO1	3	2	-	-	-	-	1	-	-	-	-	2	1
TE Lab.CO2	3	2	-	-	-	-	1	-	-	-	-	2	1
TE Lab. CO3	2	3	-	2	-	-	-	-	1	-	-	3	2
TE Lab.CO4	2	3	-	3	2	-	-	-	1	-	-	3	2
TE Lab.CO5	-	2	-	2	3	-	-	-	-	-	-	3	3
Average	**2.5**	**2.4**	**-**	**2.3**	**2.5**	**-**	**1.0**		**1.0**			**2.6**	**1.8**

Course Outcomes:

Semester No:	IV		
Course Title:	Programming Language-II (PL-II Lab)	**Course Code:**	**U24IT4L3**
Course Outcome No.	**Description**		
PL-II Lab.CO1	Develop a Java programs that demonstrate single and multilevel inheritance.		
PL-II Lab.CO2	Create Java programs that illustrate method overriding and interfaces.		
PL-II Lab. CO3	Create Java programs that demonstrate thread creation using Thread class and Runnable interface.		
PL-II Lab.CO4	Read input using Scanner class, store numbers in an array, and calculate sums of odd and even numbers.		
PL-II Lab.CO5	Demonstrate built-in exception classes and string handling functions in Java.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
PL-II Lab.CO1	3	2	3	3	2	-	-	1	1	-	2	2	2
PL-II Lab.CO2	3	2	3	1	2	-	-	1	1	-	2	1	2
PL-II Lab. CO3	3	3	3	2	3	-	-	2	1	-	2	3	3
PL-II Lab.CO4	3	3	2	2	3	-	-	1	1	-	2	3	3
PL-II Lab.CO5	3	2	2	2	3	-	-	1	1	-	2	3	3
Average	**3**	**2.4**	**2.6**	**2**	**2.8**	**-**	**-**	**1.2**	**1**	**-**	**2**	**2.4**	**2.6**

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Department of Civil Engineering

Course Outcomes & Course Articulation Matrix

ACADEMIC YEAR: 2025-26

Course Outcomes:

Semester No:	VI		
Course Title:	Geotechnical Engineering (GTE)	**Course Code:**	**U23CE601**
Course Outcome No.	**Description**		
GTE.CO1	Identify and classify the soil and their index properties.		
GTE.CO2	Calculate the capillarity and permeability parameters of soils.		
GTE.CO3	Describe the mechanisms of the process of compaction and consolidation of soils.		
GTE.CO4	Evaluate the characteristics of compaction and consolidation of soils.		
GTE.CO5	Analyze the soils for their shear strength and predict the stability of slopes.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
GTE.CO1	3	2										2	1
GTE.CO2	3	3		2	1							2	1
GTE.CO3	3	3	2	2	1							3	2
GTE.CO4	3	3	2	3			1					3	2
GTE.CO5	3	3	3	3			2					3	3
Average	**3**	**2.8**	**2.6**	**2.5**	**1**		**1.5**					**2.6**	**1.8**

Course Outcomes:

Semester No:	VI		
Course Title:	Design of Reinforced Concrete Structures (DRCS)	**Course Code:**	**U23CE602**
Course Outcome No.	**Description**		
DRCS.CO1	Analyze a singly reinforced beam to compute its dimensions and calculate the area of steel by limit state method.		
DRCS.CO2	Analyze a doubly reinforced beam, T-Beam and L-Beam to compute its dimensions and calculate area of steel by limit state method.		
DRCS.CO3	Analyze sections subjected to shear, torsion and development length.		
DRCS.CO4	Analyze a one-way slab and a two way slab to compute its dimensions and calculate area of steel by limit state method		
DRCS.CO5	Analyze columns and footings to compute its dimensions and calculate area of steel by limit state method		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
DRCS.CO1	3	3	3	1								2	3
DRCS.CO2	3	3	3	1								2	3
DRCS.CO3	3	3	3	1								2	3
DRCS.CO4	3	3	3	2								2	3
DRCS.CO5	3	3	3	2								2	3
Average	**3**	**3**	**3**	**1.4**								**2**	**3**

Course Outcomes:

Semester No:	VI		
Course Title:	Structural Analysis-II (SA-II)	**Course Code:**	**U23CE603**
Course Outcome No.	**Description**		
SA-II.CO1	Determine the maximum reactions, shear forces and bending moments for various moving load systems using influence line concepts.		
SA-II.CO2	Analyze continuous beams, trusses and plane frames using the Flexibility Matrix Method to compute redundants and draw SFD/BMD.		
SA-II.CO3	Analyze indeterminate structural systems using the Stiffness Matrix Method, including effects of support settlements.		
SA-II.CO4	Apply the Substitute Frame Method to evaluate internal forces in multi-storey RC frames subjected to vertical and live loads as per IS 456.		
SA-II.CO5	Evaluate lateral load distribution and internal forces in building frames using the Portal and Cantilever methods.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
SA-II.CO1	3	3	3	-	-	1	-	-	-	1	-	3	3
SA-II.CO2	3	2	2	2	3	-	-	-	-	-	-	3	3
SA-II.CO3	3	3	3	3	3	-	-	-	-	-	-	3	3
SA-II.CO4	3	3	3	3	3	-	-	-	-	-	-	3	3
SA-II.CO5	3	3	2	2	2	-	-	-	-	-	-	3	3
Average	**3**	**2.8**	**2.6**	**2.5**	**2.75**	**1**	**-**	**-**	**-**	**1**	**-**	**3**	**3**

Course Outcomes:

Semester No:	VI		
Course Title:	Design of Hydraulic Structures (DHS)	**Course Code:**	**U23CE604**
Course Outcome No.	**Description**		
DHS.CO1	Apply Kennedy's and Lacey's theories to design irrigation canals.		
DHS.CO2	Explain reservoir and dam types, site selection, storage, yield, and sedimentation.		
DHS.CO3	Assess the forces acting on gravity dams and perform basic stability analysis.		
DHS.CO4	Design earth dams with proper seepage control and drainage systems.		
DHS.CO5	Comprehend various components of Hydro power stations.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
DHS.CO1	3	-	3	-	-	-	-	-	-	-	-	3	2
DHS.CO2	3	2	-	-	-	-	-	-	-	-	-	2	2
DHS.CO3	-	3	-	2	-	-	-	-	-	-	-	3	2
DHS.CO4	-	-	3	-	2	-	-	-	-	-	-	3	3
DHS.CO5	2	-	-	-	-	1	-	-	-	-	-	2	1
Average	**2.6**	**2.5**	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2.6**	**2**

Course Outcomes:

Semester No:	VI		
Course Title:	Basics Of 3-D Printing (B3DP)	**Course Code:**	**U23ME610**
Course Outcome No.	**Description**		
B3DPT.CO1	Explain the fundamental concepts of 3D Printing and process parameters of additive manufacturing processes		
B3DPT.CO2	Select the suitable material and process for fabricating a given product.		
B3DPT.CO3	Describe the working principle and applications of liquid, solid and Powder based 3D Printing Technologies.		
B3DPT.CO4	Compare and contrast additive manufacturing processes with conventional manufacturing methods in terms of rate, quality, flexibility, part complexity and cost.		
B3DPT.CO5	Explore the range of 3D printing and Prototyping technologies and their application for industrial, design, and creative field.		
B3DPT.CO6	Evaluate the emerging applications of AM across major industries, including medical, dental, aerospace, vehicle structures, and consumer products and gain hands on experience in designing and fabricating AM parts.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
B3DPT.CO1	3	2	–	1	2	–	–	–	–	–	1	3	2
B3DPT.CO2	2	3	2	1	3	–	–	–	–	–	–	3	3
B3DPT.CO3	2	2	3	2	2	–	–	–	–	–	–	3	2
B3DPT.CO4	1	3	2	2	–	–	–	–	–	–	1	2	3
B3DPT.CO5	2	2	3	2	–	–	–	–	–	–	1	3	2
B3DPT.CO6	2	2	–	3	3	–	–	–	–	–	3	3	3
B3DPT.Avg	**2**	**2.3**	**2.5**	**1.8**	**2.5**	**–**	**–**	**–**	**–**	**–**	**1.5**	**2.8**	**2.5**

Course Outcomes:

Semester No:	VI		
Course Title:	Computer Aided Civil Engineering Drafting Lab (CACED Lab)	**Course Code:**	**U23CE6L1**
Course Outcome No.	**Description**		
CACED Lab.CO1	*Understand* basic building planning principles and codal provisions used in civil engineering drawings.		
CACED Lab.CO2	*Apply* AutoCAD commands and tools to prepare accurate 2D civil engineering drawings.		
CACED Lab. CO3	*Draw* detailed plans, sections, and elevations of building components such as masonry, doors, windows, staircases, and footings.		
CACED Lab.CO4	*Develop* complete plan, elevation, section, and isometric views of residential buildings using CAD software.		
CACED Lab.CO5	*Prepare* standard building and structural drawings conforming to engineering drawing practices and codes.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CACED Lab.CO1	3					2						2	1
CACED Lab.CO2	2				3							1	3
CACED Lab. CO3	2	2	3		2							3	2
CACED Lab.CO4	2	2	3		3							3	3
CACED Lab.CO5	2		3		3						2	2	3
Average	**2.2**	**2**	**3**		**2.75**	**2**					**2**	**2.2**	**2.4**

Course Outcomes:

Semester No:	VI		
Course Title:	Geotechnical Engineering Lab (GTE Lab)	**Course Code:**	**U23CE6L2**
Course Outcome No.	**Description**		
GTE Lab.CO1	Understand the broad principles of Soil Mechanics in Laboratory.		
GTE Lab.CO2	Characterize and classify the soils in Laboratory		
GTE Lab. CO3	Able to estimate seepage stresses under various loading conditions and compaction characteristics in Laboratory.		
GTE Lab.CO4	Analyze the compressibility of the soils in the laboratory.		
GTE Lab.CO5	Understand the strength of soils under various drainage conditions in the Laboratory.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
GTE Lab.CO1	3	-	-	-	-	-	-	-	-	-	-	2	1
GTE Lab.CO2	2	3	-	-	-	-	-	-	-	-	-	3	2
GTE Lab. CO3	2	3	-	3	-	-	-	-	-	-	-	3	3
GTE Lab.CO4	-	2	-	3	-	-	-	-	-	-	-	3	2
GTE Lab.CO5	3	2	-	-	-	-	-	-	-	-	-	2	2
Average	**2.5**	**2.5**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.6**	**2**

Course Outcomes:

Semester No:	VI		
Course Title:	Research Paper Writing Lab (RPW Lab)	**Course Code:**	**U23EN6L1**
Course Outcome No.	**Description**		
RPW Lab.CO1	Define the fundamentals of research, including its purpose, types, ethics, plagiarism, and the basic format of a research paper.		
RPW Lab.CO2	Explain the research process steps, including topic selection, hypothesis formulation, data collection, and data analysis, along with their significance in academic research.		
RPW Lab. CO3	Apply research methodologies to structure a research paper, focusing on the title, abstract, introduction, literature review, and methodology sections.		
RPW Lab.CO4	Analyze collected data to interpret findings and present them effectively in the form of research discussions and results.		
RPW Lab.CO5	Evaluate the quality of research papers by assessing their adherence to ethical standards, proper documentation, and logical organization of content.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO1 0**	**PO11**	**PSO1**	**PSO2**	
RPW Lab.CO1	3	3	2	3	2	2	-	-	2	-	-	-	2	2
RPW Lab.CO2	3	3	2	3	2	2	2	-	2	-	-	-	2	2
RPW Lab. CO3	3	3	2	3	2	2	-	-	2	-	-	-	2	2
RPW Lab.CO4	3	3	2	3	2	2	2	-	2	-	-	-	2	2
RPW Lab.CO5	3	3	2	3	2	2	-	-	2	-	-	-	2	2
Average	**3**	**3**	**2**	**3**	**2**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**2**	**2**

Course Outcomes:

Semester No:	VI		
Course Title:	Aptitude and Reasoning Skills Lab (A&RS Lab)	**Course Code:**	**U23MA6L4**
Course Outcome No.	**Description**		
A&RS Lab.CO1	Explain and interprets Data analysis through percentages, measures of central tendency.		
A&RS Lab.CO2	Calculate the problems related to number series and reasoning ability		
A&RS Lab. CO3	Analyse the number system pattern and determine profit and losses.		
A&RS Lab.CO4	Evaluate proportions, time framework problems.		
A&RS Lab.CO5	Compute problems based on Combinatorics, clock, calendar, plane figures and solid figures.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
A&RS Lab.CO1	3	3	3	3	2							2	2
A&RS Lab.CO2	3	3	3	3	2							2	2
A&RS Lab. CO3	3	3	3	3	2							2	2
A&RS Lab.CO4	3	3	3	3	2							2	2
A&RS Lab.CO5	3	3	3	3	2							2	2
Average	**3**	**3**	**3**	**3**	**2**							**2**	**2**

Course Outcomes:

Semester No:	VI		
Course Title:	Seminar (SEM)	**Course Code:**	**U23CE6P2**
Course Outcome No.	**Description**		
SEM.CO1	Understand current industrial needs, emerging technologies, and professional practices in civil engineering through technical literature.		
SEM.CO2	Explain and apply appropriate engineering techniques, processes, and modern tools used in industry and research applications.		
SEM. CO3	Analyze and interpret technical literature to identify engineering concepts, tools, and methodologies relevant to the seminar topic.		
SEM.CO4	Analyze collected information and prepare a structured, technically sound seminar report with logical flow and clarity.		
SEM.CO5	Analyze professional, ethical, and societal considerations related to the selected seminar topic and present conclusions effectively.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
SEM.CO1	3	2	–	–	–	2	–	–	1	–	2	2	1
SEM.CO2	3	2	–	–	3	–	–	–	1	–	1	3	2
SEM. CO3	2	3	–	2	–	–	–	–	2	–	2	2	2
SEM.CO4	–	2	–	–	–	–	–	3	3	–	1	1	1
SEM.CO5	–	–	–	–	–	2	3	2	2	1	3	1	1
Average	**2.67**	**2.25**	**–**	**2.0**	**3.0**	**2.0**	**3.0**	**2.5**	**1.8**	**1.0**	**1.8**	**1.8**	**1.4**

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Department of Civil Engineering

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Course Outcomes & Course Articulation Matrix

ACADEMIC YEAR: 2025-26

Course Outcomes:

Semester No:	VIII		
Course Title:	Repair and Rehabilitation of Structures (RRS)	**Course Code:**	**U21CE802**
Course Outcome No.	**Description**		
RRS.CO1	Identify the types, causes, and characteristics of defects and damages in buildings during pre-construction, construction, and post-construction stages.		
RRS.CO2	Explain the mechanisms of deterioration in concrete and steel structures and factors influencing their durability.		
RRS.CO3	Analyze structural distress using destructive and non-destructive testing (NDT) techniques for condition assessment.		
RRS.CO4	Apply suitable repair materials and techniques for restoring damaged concrete and masonry components.		
RRS.CO5	Apply appropriate retrofitting and strengthening methods such as jacketing, section enlargement, FRP systems, and underpinning.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
RRS.CO1	3	2	–	2	–	–	–	–	–	–	–	3	2
RRS.CO2	3	3	2	3	–	1	–	–	–	–	–	2	3
RRS.CO3	3	2	3	3	3	–	–	–	–	–	–	3	3
RRS.CO4	3	3	2	3	3	–	–	–	–	–	–	3	2
RRS.CO5	3	3	3	3	3	–	–	–	–	1	1	3	3
Average	**3.0**	**2.6**	**2.5**	**2.8**	**3**	**1**	**-**	**-**	**-**	**1**	**1**	**2.8**	**2.6**

Course Outcomes:

Semester No:	VIII		
Course Title:	GIS and Remote Sensing (GIS&RS)	**Course Code:**	**U21CE809**
Course Outcome No.	**Description**		
GIS&RS.CO1	Understand fundamentals and components of GIS and Remote Sensing.		
GIS&RS.CO2	Apply spatial data models, projections, and transformations for geospatial analysis		
GIS&RS.CO3	Perform spatial and terrain analysis using raster and vector data.		
GIS&RS.CO4	Interpret remote sensing data and apply digital image processing techniques.		
GIS&RS.CO5	Integrate GIS and Remote Sensing for real-world environmental and urban applications.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
GIS&RS.CO1	3											2	1
GIS&RS.CO2	2	3			3							2	3
GIS&RS.CO3	2	3	3		3							2	3
GIS&RS.CO4	2	3		3	3							2	3
GIS&RS.CO5	2	3	3		3	2	3					3	3
Average	**2.2**	**3**	**3**	**3**	**3**	**2**	**3**					**2.2**	**2.6**

Course Outcomes:

Semester No:	VIII		
Course Title:	Fundamentals of Wireless Communication (FWC)	**Course Code:**	**U21EC805**
Course Outcome No.	**Description**		
FWC.CO1	Explain the evolution of wireless standards (2G–4G) and analyze system performance under fading and BER conditions.		
FWC.CO2	Demonstrate the working principles of CDMA, including spreading codes, correlation properties, and multi-user access.		
FWC.CO3	Apply MIMO system models and receiver techniques to evaluate wireless capacity improvements.		
FWC.CO4	Analyze OFDM-based systems, including BER performance, frequency offset effects, PAPR issues, and SC-FDMA.		
FWC.CO5	Compare WLAN and broadband wireless standards (IEEE 802.11, 802.16, PANs) and assess their applications.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
FWC.CO1	3	2	2	2	-	-	-	-	-	-	-	3	2
FWC.CO2	2	3	2	2	-	-	-	-	-	-	-	2	3
FWC.CO3	3	3	3	2	-	-	-	-	-	-	-	3	3
FWC.CO4	3	3	2	3	-	-	-	-	-	-	-	3	3
FWC.CO5	2	2	2	2	-	-	-	-	-	-	-	2	3
Average	**2.6**	**2.6**	**2.2**	**2.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.6**	**2.8**

Course Outcomes:

Semester No:	VIII		
Course Title:	Project (PRJ)	**Course Code:**	**U21CE8P1**
Course Outcome No.	**Description**		
PRJ.CO1	Identify and define a real-time civil engineering problem through literature survey and field study.		
PRJ.CO2	Apply engineering principles and domain knowledge to formulate project objectives and methodology.		
PRJ.CO3	Analyze collected data using appropriate tools, techniques, and standards.		
PRJ.CO4	Design and develop feasible solutions considering technical, economic, environmental, and societal constraints.		
PRJ.CO5	Prepare a comprehensive project report and effectively present project outcomes as an individual or team		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
PRJ.CO1	3	2	-	2	-	-	1	-	-	-	-	2	2
PRJ.CO2	3	3	2	-	2	-	-	-	1	-	-	3	2
PRJ.CO3	2	3	-	3	2	-	-	-	1	-	-	3	3
PRJ.CO4	2	3	3	2	2	1	2	-	1	-	-	3	3
PRJ.CO5	-	2	2	-	3	-	-	-	3	3	2	3	3
Average	**2.5**	**2.6**	**2.3**	**2.3**	**2.3**	**1.0**	**1.5**	**-**	**1.5**	**1.5**	**2.0**	**2.8**	**2.6**

Course Outcomes:

Semester No:	VIII		
Course Title:	Comprehensive viva-voce (CVV)	**Course Code:**	**U21CE8P2**
Course Outcome No.	**Description**		
CVV.CO1	Recall and explain fundamental concepts across core civil engineering subjects		
CVV.CO2	Apply theoretical knowledge to answer multidisciplinary engineering questions		
CVV.CO3	Analyze engineering problems and justify suitable solutions.		
CVV.CO4	Evaluate alternative solutions considering safety, sustainability, and feasibility.		
CVV.CO5	Communicate technical knowledge effectively during viva-voce examination.		

Course Articulation Matrix:

Mapping of Course Outcomes (CO) with Program Outcomes (PO's) and Program Specific Outcomes (PSO's):

Course Outcomes (CO's)	**Program Outcomes (PO)**											**Program Specific Outcomes (PSO's)**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CVV.CO1	3	2	-	-	-	-	-	-	-	-	-	2	2
CVV.CO2	3	3	-	-	2	-	-	-	1	-	-	3	2
CVV.CO3	2	3	-	2	2	-	-	-	1	-	-	3	3
CVV.CO4	2	3	2	-	2	1	2	-	1	-	-	3	3
CVV.CO5	-	2	2	-	3	-	-	-	3	3	2	3	3
Average	**2.5**	**2.6**	**2**	**2**	**2.25**	**1**	**2**		**1.5**	**3**	**2**	**2.8**	**2.6**