Dr. Ambedkar Institute of Technology, Bengaluru - 560056
Department of Civil Engineering

Course Title	**ENGINEERING MECHANICS**						
Course Code	**1BCVT105**						
Category	**Professional Specific Course (PSC)**						
Scheme & Credits	No. of Hours per week					Total Teaching hours	Credits
	L	T	P	SS	Total		
	3	**0**	**0**	**0**	**3**	**40**	**03**
CIE Marks: 50	**SEE Marks: 50**		**Total Max. Marks: 100**			**Duration of SEE: 03 hours**	

Course Learning Outcomes:
To make students analyze the problems involving forces, moments with their applications, understand the concept of equilibrium and friction along with their applications and develop the student's ability to find out the center of gravity and moment of inertia and their applications.

UNIT – I **08 Hours**

FORCE SYSTEMS:

Basic dimensions and units, Idealisation, Force, Classification of force system, Principle of transmissibility of a force, Composition and Resolution of forces, Free body diagrams, Resultant of coplanar concurrent and non-concurrent force system, Moment, Couple and Characteristics of couple, Varignon's theorem, Numerical Examples.

UNIT – II **08 Hours**

EQUILIBRIUM:

Conditions of static equilibrium, Equilibrium of coplanar concurrent force systems, Lami's theorem, Equilibrium of coplanar non-concurrent force system, Numerical examples.

Types of supports, loadings and beams, Concept of statically determinate and indeterminate beams.

Support reactions for statically determinate beams subjected to various loadings, Numerical examples.

UNIT – III **08 Hours**

FRICTION:

Introduction, Types of friction, Concept of static friction, Kinetic (Dynamic) friction, Laws of friction, Angle of friction, Angle of repose, Cone of friction, Equilibrium of blocks on horizontal and inclined plane, Ladder friction, Wedge friction, Numerical examples.

UNIT – IV **08 Hours**

CENTROID:

Introduction, Definitions of centroid and centre of gravity, Axes of reference, Axes of symmetry, Locating the centroid of square, rectangle, triangle, circle, semicircle, quadrant and sector of a circle using method of integration, Centroid of composite areas and simple built-up sections, Numerical examples.

UNIT – V **08 Hours**

MOMENT OF INERTIA OF PLANE AREAS:

Introduction, Moment of inertia about an axis, Parallel axes theorem, Perpendicular axes theorem, Polar moment of inertia, Radius of gyration, Moment of inertia of square, rectangular, triangular and circular areas from the method of Integration, Moment of inertia of composite areas and simple built-up sections, Numerical Examples.

Teaching & Learning Process:
Chalk and talk, Power point presentations, Animations and Videos.

Course Outcomes: The students will be able to	
CO1	Understand the concept of engineering mechanics, force system and Compute the resultant of various force systems, examine the types of loads on rigid bodies.
CO2	Analyze the forces for equilibrium and the reactive forces in various members of the structure.
CO3	Analyze the forces and behavior of bodies in contact with different surfaces.

CO4	Locate the centroid of the plane and built-up sections.
CO5	Compute the moment of inertia of the plane and built-up sections.

Text Books:	
1	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, third edition, 2015, Laxmi Publications, ISBN: 9789380856674.
2	Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, Eleventh edition, 2018, Eastern Book Promoters Belgaum [EBPB], ISBN: 5551234003896.

Reference Books:	
1	Beer F.P. and Johnston E. R., Mechanics for Engineers: Statics and Dynamics, Fourth edition, 1987, McGraw Hill, ISBN: 9780070045842.
2	Meriam J. L. and Kraige L. G, Engineering Mechanics-Statics, Vol I–sixth Edition, 2008, Wiley publication.
3	Irving H. Shames, Engineering Mechanics-Statics and Dynamics, fourth edition, 2002, Prentice-Hall of India (PHI)
4	Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, fourteenth edition, 2017, Pearson Press, New Delhi. ISBN:9789332584747.
5	Timoshenko S, Young D. H., Rao J. V., Sukumar Patil, Engineering Mechanics, fifth Edition, 2017, McGraw Hill Publisher, ISBN: 9781259062667
6	Bhavikatti S S, Engineering Mechanics, fourth edition, 2018, New Age International Publications.
7	Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, third edition 2013, BS Publications
8	J K Gupta and S K Gupta, Engineering Mechanics and Applied Mechanics, first edition, 2021, Cengage learning. ISBN: 9789353505851.

Web links and Video Lectures (e-Resources)	
1.	https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT
2.	https://www.youtube.com/watch?v=nkg7VNW9UCc&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=2
3.	https://www.youtube.com/watch?v=ljDIIMvxeg&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=5
4.	https://www.youtube.com/watch?v=VQRcChR9IkU&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=18
5.	https://www.youtube.com/watch?v=3YBXteL-qY4
6.	https://www.youtube.com/watch?v=z95UW4wwzSc&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=10
7.	https://www.youtube.com/watch?v=lheoBL2QaqU&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=7
8.	https://www.youtube.com/watch?v=atoP5_DeTPE
9.	https://www.youtube.com/watch?v=ksmsp9OzAsI
10.	https://www.youtube.com/watch?v=x1ef048b3CE
11.	https://www.youtube.com/watch?v=l_Nck-X49qc
12.	https://play.google.com/store/apps/details?id=appinventor.ai_jgarc322.Resultant_Force
13.	https://www.youtube.com/watch?v=RIBeeW1DSZg
14.	https://www.youtube.com/watch?v=R8wKV0UQtlo
15.	https://www.youtube.com/watch?v=0RZHHgL8m_A
16.	https://www.youtube.com/watch?v=Bls5KnQOWkY

Assessment Structure:

The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage.

• To qualify and become eligible to appear for SEE, a student must score at least 40% of 50 marks i.e., 20marks in the CIE.

• To pass the SEE, a student must score at least 35% of 50 marks, i.e., 18 marks.

• A student is considered to have passed the course, provided the combined total of CIE and SEE is at least40 out of 100 marks.

Continuous Comprehensive Assessments (CCA):

CCA will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course objectives and promote higher-order thinking and application-based learning.

Learning Activity -1: (Marks- ___)

Learning Activity -2 (optional): (Marks- ___)

Rubrics for Learning Activity (Based on the nature of learning activity, design the rubrics for each activity):

	Superior	Good	Fair	Needs Improvement	Unacceptable
Performance Indicator - 1(CO/PO Mapping)					
PerformanceIndicator -2(CO/PO Mapping)					
….					
Performance Indicator-n (CO/PO Mapping)					

Suggested Learning Activities may include (but are not limited to):

- Course Project
- Case Study Presentation
- Programming Assignment
- Tool/Software Exploration
- Literature Review
- Open Book Test (preferably at RBL4 and RBL5 levels)
- GATE-based Aptitude Test
- Assignment (at RBL3, RBL4, or RBL5 levels)
- Any other relevant and innovative academic activity
- Use of MOOCs and Online Platforms

Suggested Innovative Delivery Methods may include (but are not limited to):

- Flipped Classroom
- Problem-Based Learning (PBL)
- Case-Based Teaching- Simulation and Virtual Labs
- Partial Delivery of course by Industry expert/ industrial visits
- ICT-Enabled Teaching- Role Play

CO-PO Mapping											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1									1
CO2	3	1									1

CO3	3	1									1
CO4	3	1									1
CO5	3	1									1

Dr. Ambedkar Institute of Technology, Bengaluru - 560056
Department of Civil Engineering

Course Title	**MECHANICS AND MATERIALS LABORATORY**						
Course Code	**1BCVL107**						
Category	**Practical**						
Scheme & Credits	No. of Hours per week					Total Teaching hours	Credits
	L	T	P	SS	Total		
	0	**0**	**2**	**0**	**02**	**12**	**01**
CIE Marks: 50	**SEE Marks: 50**		**Total Max. Marks: 100**			**Duration of SEE: 02 hours**	

Course Learning Objectives:

To make students analyze the problems involving forces, moments with their applications, understand the concept of equilibrium and material properties along with their applications and develop the student's ability to explore design and conduct the experiments with creativity, critical thinking, and inquiry-based learning.

PART- A **CONVENTIONAL EXPERIMENTS**
1. Verification of Lami's Theorem.
2. Equilibrium of concurrent forces.
3. Parallel force system - Simply supported beam.
4. Verification of Varignon's theorem.
5. Specific Gravity of a) Fine aggregates. b) Coarse aggregates. c) Cement. d) Soil.
6. Sieve analysis of soil - Graphical representation of the Gradation curve.
7. Visual identification of building materials: Bricks, Stones, Tiles, M-Sand, Bitumen, Fly-Ash, GGBS, Steel Bars of Various Sizes.
PART – B **TYPICAL OPEN-ENDED EXPERIMENTS** Open-ended experiments are a type of laboratory activity where the outcome is not predetermined, and students are given the freedom to explore, design, and conduct the experiment based on the problem statements as per the concepts defined by the course coordinator. It encourages creativity, critical thinking, and inquiry-based learning.
1. Support reactions.
2. Field tests on cement.
3. Particle size distribution (Well graded, Uniformly graded and Gap graded).

Teaching & Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

1. Active Learning Techniques
2. Problem-Based Learning (PBL)
3. Team-Based Learning (TBL)
4. Hands-On Experiments and Simulations

Course Outcomes: The students will be able to	
CO1	Analyse force systems and verify Lami's theorem.
CO2	Analyse force systems and verify Varignon's theorem.
CO3	Analyze the forces for equilibrium and simply supported beam.
CO4	Identify and understand the properties of various construction materials.
CO5	Classify the soil sample and represent it with the gradation curve.

Text Books:	
1	M. L. Gambhir: Concrete Manual: Dhanpat Rai & sons New – Delhi, ISBN-135551234001965.
2	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, third edition, 2015, Laxmi Publications, ISBN: 9789380856674
3	Ramamrutham.S, Engineering Mechanics, Dhanpat Rai Books, 2013, ISBN: 9789352164271.
4	Soil Mechanics and foundation Engineering by B C Punmia, Ashok kumar jain, Arun kumar jain, 18th edition, 2023, Laxmi Publications New Delhi.

Reference Books:	
1	Meriam J. L. and Kraige L. G, Engineering Mechanics-Statics, Vol I–sixth Edition,2008, Wiley publication.
2	Rattan S.S., Strength of Materials, Third edition, 2017, McGraw Hill Education; New Delhi. ISBN-13978-9385965517.
3	Bansal R K, Strength of Materials, Laxmi Publications. 2023, 4th Edition, ISBN:978-8131808146.
4	IS 4031 (Part 11):1988 – Specific gravity test for hydraulic cement.
5	IS 383:1970 – Specification for coarse and fine aggregates from natural sources for concrete.
6	IS 2386(Part 3):1963 Methods of test for aggregates for concrete: Part 3 Specific gravity, density, voids, absorption and bulking.
7	IS 2720 (Part 3/Sec 1):1980 – Determination of specific gravity of soil.

Web links and Video Lectures (e-Resources):	
1	https://www.nptel.ac.in/courses/122104015/
2	https://nptel.ac.in/courses/112103109/
3	http://vlab.co.in/

Process of Assessment (both CIE and SEE):

Note:

1. The laboratory syllabus consists of PART-A and PART-B. While PART-A has 6 conventional experiments, PART-B has 6 typical open-ended experiments. The maximum marks for the laboratory course are 100.
2. Both PART-A and PART-B are considered for CIE and SEE.
3. Students have to answer 1(one) question from PART-A and 1(one) question from PART-B.
    a. The questions set for SEE shall be from among the experiments under PART-A. It is evaluated for 70 marks out of the maximum 100 marks.
    b. The open-ended question set for SEE shall be any other open-ended question and not selected from the experiments under PART-A. It shall be evaluated for 30 marks.
4. For continuous internal evaluation, during the semester, classwork, the typical open-ended questions shall be from PART-B, and any other similar questions to enhance the skill of the students

Assessment Structure:

The assessment for each course is equally divided between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each component carrying 50% weightage (i.e., 50 marks each).
The CIE Theory component will be 25 marks and CIE Practical component will be 25 marks.

The CIE marks awarded shall be based on the continuous evaluation of the laboratory report using a defined set of rubrics. Each experiment report can be evaluated for 30 marks. The laboratory test (duration 03 hours) at the end of the last week of the semester /after completion of all the experiments (whichever is early) shall

be conducted for 50 marks and scaled down to 20 marks. For both CIE and SEE, the student is required to conduct one experiment each from both Part A and Part B.

Rubrics for CIE – Continuous assessment:

	Superior	**Good**	**Fair**	**Needs Improvement**	**Unacceptable**
Performance Indicator- 1 (CO/PO Mapping)					
Performance Indicator-2 (CO/PO Mapping)					
…					
Performance Indicator-n (CO/PO Mapping)					

Rubrics for SEE / CIE Test:

	Superior	**Good**	**Fair**	**Needs Improvement**	**Unacceptable**
Performance Indicator- 1 (CO/PO Mapping)					
Performance Indicator-2 (CO/PO Mapping)					
…					
Performance Indicator-n (CO/PO Mapping)					

- To qualify and become eligible to appear for SEE, in the **CIE component**, a student must secure **a minimum of 40% of 50 marks**, i.e., **20 marks**.
- To pass the **SEE component**, a student must secure **a minimum of 35% of 50 marks**, i.e., **18 marks**.
- A student is deemed to have **successfully completed the course** if the **combined total of CIE and SEE is at least 40 out of 100 marks**.

Rubrics suggested for Practical continuous assessment				
Performance Indicators	**Excellent**	**Very Good**	**Good**	**Satisfactory**

Fundamental Knowledge (4) (PO1)	The student has well depth knowledge of the topics related to the course (4)	Student has good knowledge of some of the topics related to course (3)	Student is capable of narrating the answer but not capable to show in depth knowledge (2)	Student has not understood the concepts clearly (1)
Design of Experiment (5) (PO2 & PO3)	Student is capable of discussing more than one design for his/her problem statement and capable of proving the best suitable design with proper reason (5)	Student is capable of discussing few designs for his/her problem statement but not capable of selecting best (4)	Student is capable of discussing single design with its merits and de-merits (3)	Student is capable of explaining the design (1-2)
Implementation (8) (PO3 & PO8)	Student is capable of implementing the design with best suitable algorithm considering optimal solution. (7-8)	Student is capable of implementing the design with best suitable algorithm and should be capable of explaining it (5-6)	Student is capable of implementing the design with proper explanation. (3-4)	Student is capable of implementing the design. (1-2)
Result &Analysis (5) (PO4)	Student is able to run the program on various cases and compare the result with proper analysis. (5)	Student will be able to run the program for all the cases. (4)	Student will be able to run the code for few cases and analyze the output. (3)	Student will be able to run the program but not able to analyze the output. (1-2)
Demonstration (8) (PO9)	The lab record is well- organized, with clear sections (e.g., Introduction, Method, Results, Conclusion). Transitions between sections are smooth. (7-8)	The lab record is organized, with clear sections, but some sections are not well- defined. (5-6)	The lab record lacks clear organization or structure. Some sections are unclear or incomplete. (3-4)	The lab record is poorly organized, with missing or unclear sections. (1-2)

Note: Can add Engineering & IT tool usage based on the nature of the course

CO-PO Mapping											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1	1						1		1
CO2	3	1	1						1		1
CO3	3	1	1						1		1
CO4	3	1	1						1		1
CO5	3	1	1						1		1

Dr. Ambedkar Institute of Technology, Bengaluru - 560056
Department of Civil Engineering

Course Title	**BUILDING SCIENCE AND MECHANICS**						
Course Code	**1BEST104A / 1BEST204A**						
Category	**Engineering Science Course (ESC) - I/II**						
Scheme & Credits	No. of Hours per week					Total Teaching hours	Credits
	L	T	P	SS	Total		
	3	**0**	**0**	**0**	**3**	**40**	**03**
CIE Marks: 50	**SEE Marks: 50**		**Total Max. Marks: 100**		**Duration of SEE: 03 hours**		

Course Learning Objectives:

To provide students with a foundational understanding of the discipline, including its various sub-disciplines, fundamental concepts, real-world applications, infrastructure planning, material properties, and structural analysis in the Civil Engineering field.

UNIT – I **08 Hours**

INTRODUCTION TO BUILDING SCIENCE:

IMPORTANCE AND SCOPE OF VARIOUS FIELDS OF CIVIL ENGINEERING:

Surveying, Structural Engineering, Geotechnical Engineering, Water Resources Engineering, Transportation Engineering, Environmental Engineering, Construction Planning and Project Management.

BASIC MATERIALS OF CONSTRUCTION:

Types and Uses of Bricks, Stones, Cement, Structural Steel, Wood and Concrete.

STRUCTURAL ELEMENTS OF A BUILDING:

Foundation, Plinth, Lintel, Chejja, Masonry wall, Column, Beam, Slab, Flooring and Staircase.

UNIT – II **08 Hours**

SUSTAINABLE BUILT ENVIRONMENT:

Introduction to sustainable development goals, Smart city concept, Clean city concept, Safe city concept.

EMERGING MATERIALS:

Types and Uses of Autoclaved Aerated Concrete (AAC) blocks, Bamboo, Recycled plastics, Material selection criteria, Durability, Sustainability, Smart City concept.

GREEN BUILDING:

Green building materials and rating systems IGBC, LEED, GRIHA (Green Rating for Integrated Habitat Assessment) for new buildings – Purpose – Key highlights – Point System with Differential weightage.

UNIT – III **08 Hours**

FORCE SYSTEMS:

Concept of idealization, System of forces, Principles of transmissibility of a force, Resolution and composition of forces, Law of Parallelogram of forces, Concurrent and non-concurrent coplanar force systems, Moment of forces, Couple, Varignon's theorem, Numerical examples.

UNIT – IV **08 Hours**

EQUILLIBRIUM AND SUPPORT REACTIONS:

Free body diagram, equations of equilibrium, Lami's Theorem, Equilibrium of Coplanar Concurrent and Non-concurrent force systems: Numerical examples.

Types of loadings, beams and supports, Concept of Statically determinate and indeterminate structures (Definitions with examples only).

Support reactions: Numerical examples on Statically determinate beams.

UNIT – V **08 Hours**

CENTROID OF PLANE AREAS:

Introduction, Locating the centroid of rectangle, triangle, circle, semicircle and quadrant of a circle using method of integration, centroid of composite areas and simple built up sections: Numerical examples.

Teaching & Learning Process:

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching-learning process and facilitate the achievement of course outcomes.

1. Flipped class
2. Chalk and talk
3. NPTEL and other videos for theory topics
4. Partial Delivery of course by Industry expert/ industrial visits
5. ICT-Enabled Teaching
6. Individual teachers can device innovative pedagogy to improve teaching-learning

Course Outcomes: The students will be able to	
CO1	Explain the fundamental concepts of building science, disciplines of civil engineering, construction materials, and structural elements of buildings.
CO2	Evaluate the sustainability aspects of the built environment through appropriate selection of green materials and interpretation of rating systems.
CO3	Analyse the principles of force systems.
CO4	Analyse equilibrium to determine support reactions.
CO5	Locate the centroid of simple and composite plane areas using first principles.

Text Books:	
1	Rangwala, Building Construction, 33rd Edition, 2016, Charotar Publishing House Pvt. Ltd., ISBN-10 : 9385039040, ISBN-13 : 978-9385039041
2	Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, 3rd Edition, 2015, Laxmi Publications, ISBN: 9789380856674.
3	Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, 11th Edition, 2018, Eastern Book Promoters Belgaum [EBPB], ISBN: 5551234003896

Reference Books:	
1	Beer F.P. and Johnston E. R., Mechanics for Engineers: Statics and Dynamics, 4th Edition, 1987, McGraw Hill, ISBN: 9780070045842
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3	Irving H. Shames, Engineering Mechanics-Statics and Dynamics, 4th Edition, 2002, Prentice-Hall of India(PHI).
4	Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, fourteenth edition, 2017, Pearson Press, New Delhi, ISBN:9789332584747.
5	Timoshenko S, Young D. H., Rao J. V., Sukumar Patil, Engineering Mechanics, fifth Edition, 2017, McGraw Hill Publisher, ISBN: 9781259062667

6	Bhavikatti S S, Engineering Mechanics, fourth edition, 2018, New Age International Publications.
7	Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, third edition 2013, BS Publications.

Web links and Video Lectures (e-Resources)	
1	https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT
2	https://www.youtube.com/watch?v=nkg7VNW9UCc&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=2
3	https://www.youtube.com/watch?v=ljDIIMvxeg&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=5
4	https://www.youtube.com/watch?v=3YBXteL-qY4
5	https://www.youtube.com/watch?v=z95UW4wwzSc&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=10
6	https://www.youtube.com/watch?v=ksmsp9OzAsI
7	https://www.youtube.com/watch?v=x1ef048b3CE
8	https://www.youtube.com/watch?v=l_Nck-X49qc
9	https://www.youtube.com/watch?v=R8wKV0UQtlo
10	https://www.youtube.com/watch?v=0RZHHgL8m_A
11	https://www.youtube.com/watch?v=Bls5KnQOWkY
	Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning
12	https://www.youtube.com/watch?v=Zrc_gB1YYS0
13	https://www.youtube.com/watch?v=Hn_iozUo9m4

Assessment Structure: (Both CIE and SEE)
The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage.

- To qualify and become eligible to appear for SEE, in the **CIE**, a student must score at least **40% of 50 marks**, i.e., **20 marks**.
- To pass the **SEE**, a student must score at least **35% of 50 marks**, i.e., **18 marks**.

Notwithstanding the above, a student is considered to have **passed the course,** provided the combined total of **CIE and SEE is at least 40 out of 100 marks**.

Continuous Comprehensive Assessments (CCA):

Dr. Ambedkar Institute of Technology, Bengaluru - 560056
Department of Civil Engineering

CCA will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course objectives and promote higher-order thinking and application-based learning.
Learning Activity -1: (Marks- ___)
Learning Activity -2 (optional): (Marks- ___)

Rubrics for Learning Activity (Based on the nature of learning activity, design the rubrics for each activity):

	Superior	Good	Fair	Needs Improvement	Unacceptable
Performance Indicator-1(CO/PO Mapping)					
PerformanceIndicator-2(CO/PO Mapping)					
….					
Performance Indicator-n (CO/PO Mapping)					

Suggested Learning Activities may include (but are not limited to):

- Course Project
- Case Study Presentation
- Literature Review
- Open Book Test (preferably at RBL4 and RBL5 levels)
- GATE-based Aptitude Test
- Assignment (at RBL3, RBL4, or RBL5 levels)
- Any other relevant and innovative academic activity
- Use of MOOCs and Online Platforms

Suggested Innovative Delivery Methods may include (but are not limited to):

- Flipped Classroom
- Problem-Based Learning (PBL)
- Case-Based Teaching
- Partial Delivery of course by Industry expert/ industrial visits
- ICT-Enabled Teaching
- Role Play

CO-PO Mapping											
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3						1				1
CO2	3						1				1
CO3	3	1									1
CO4	3	1									1
CO5	3	1									1

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Department of Civil Engineering

CV: 2025 Scheme First Year Syllabus