Muffakham Jah College of Engineering and Technology

(Sultan-ul-uloom Education Society)

Affiliated to Osmania University, Approved by AICTE

Accredited by NAAC and NBA (Civil, CSE, ECE and Mech)

Mount Pleasant, 8-2-249 to 267, Road No. 3, Banjara Hills, Hyderabad - 500 034, Telangana, India

Lighted to Enlighten

ESTD : 1980

Scheme of Instruction, Examination & Syllabi for

B.E. I to VIII Semester of Four-Year Degree program in

Civil Engineering

(With effect from the AY 2025-26)

A UGC Autonomous Institution from the year 2025-26

Bachelor of Engineering (B.E) R 25

Courses offered:

BE.(CE, ME, ECE, CSE, CSE(AI), CSE(DS) & CSE(AI&ML))

SCHEME OF INSTRUCTIONS

of

B.E. CIVIL ENGINEERING

(I to VIII Semesters)

With Effect from the Batch 2025-2029

SCHEME OF INSTRUCTION

Dean (Academics) MJCET

S.V.N. Reddy
HEAD
DEPT. OF CIVIL ENGINEERING
MUFFAKHAM JAH COLLEGE OF ENG. & TECH
Road No: 3, Banjara Hills, Hyderabad-34.

Mr M. Sanjay

PROFESSOR
Department of Civil Engineering
University College of Engineering
(Autonomous)
Osmania University, Hyderabad-500 007.

Vision

To produce technically competent and socially responsible civil engineers to propel infrastructural development.

Mission

To impart quality education and inculcate professional skills to function as proficient planners, designers and constructors capable of ensuring sustainability and safety.

Dean (Academics)
MJCET

Programme Educational Objectives (PEO):

PEO1: Impart basic knowledge in the field of Civil Engineering.

PEO2: Develop skills to analyze and provide viable solutions to various Civil Engineering problems.

PEO3: Enhance communication skills and encourage team work.

PEO4: Prepare Civil Engineering professionals with zeal for research, life-long learning, and work for sustainable development of society with ethics.

PROGRAM OUTCOMES (POs)

POs	Engineering Graduates will be able to:
PO1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering Solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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(Academics)
MJCET

	PROGRAM SPECIFIC OUTCOMES (PSOs)
PSO1	**Analytical Skill:** Ability to plan, execute, manage and rehabilitate Civil Engineering systems and processes.
PSO2	**Entrepreneurial Skill:** Ability to become independent practitioners, consultant and entrepreneurs in the field of Civil Engineering.

MAPPING OF PEO'S WITH PO'S

S.No.	PEO Statement	M1	M2	M3
PEO 1	Impart basic knowledge in the field of Civil Engineering	3	2	2
PEO 2	Develop skills to analyze and provide viable solutions to various Civil Engineering problems.	3	3	2
PEO 3	Enhance communication skills and encourage team work.	2	2	1
PEO 4	Prepare Civil Engineering professionals with zeal for research, life-long learning, and work for sustainable development of society with ethics.	3	3	3

Rubrics

1 : Weakly mapped

2 : Moderately mapped

3 : Strongly mapped

PEO	Justification and rationale of the mapping
PEO 1	Mainly focuses on imparting basic knowledge in Civil Engineering to produce highly competent and capable professionals. Accordingly, the correlations are assigned.
PEO 2	Emphasis is on training to inculcate analytical skills to design various Civil Engineering problems. Hence, the correlations are allotted.
PEO 3	Focuses on personality development, character building and to work with peers. Therefore, the correlations are justified.
PEO 4	Equip with required skills to effectively tackle the real-life problems of Civil Engineering in sustainable manner. Therefore, M1 to M3 are in good agreement.

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3.V.N.Reddy
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Range of credits as per AICTE - A range of credits from 160 to 164 for a student to be eligible to get Under Graduate degree in Engineering. A student will be eligible to get Under Graduate degree with Honours or additional Minor Engineering, if he/she completes an additional 18 credits. These could be acquired through MOOCs.

S.No.	Category	Breakup of Credits (Total 164)
1	Humanities and Social Sciences including Management courses	**06**
2	Basic Science Courses	**24**
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	**20**
4	Professional core courses	**58**
5	Professional Elective specialization/branch	**26**
6	Indian Knowledge System	**02**
7	Multidisciplinary Open Electives Courses	**12**
8	Project work, seminar and internship in industry or appropriate work place/academic and research institutions in India/abroad.	**13**
9	Mandatory Non-Credit Courses – Audit Course	(non-credit)
10	**Total**	**160 ~164**

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Distribution of credits for the Proposed Scheme for B.E (Civil) Autonomous w.e.f AY 2025-26			
S.No	**Course Type**	**No. of Credits as per the proposed Scheme**	**No. of Credits as recommended by AICTE**
1	Humanities and Social Sciences (HS)	**6**	6
2	Basic Sciences (BS)	**21**	24
3	Engineering Sciences (ES)	**16**	20
4	Program Core (PC)	**70**	58
5	Program Electives (PE)/MOOC's/NPTEL	**15**	26
6	Open Electives (OE)	**9**	12
7	Project / Seminar / Internship	**20**	16
8	Mandatory Courses (MC)	**0**	(Non-Credit)
9	Skill Development Courses (SDC)	**3**	2
	Total	**160**	**160 ~ 164**

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ESTD : 1980

UGC AUTONOMOUS

Board of Studies for B. E. Civil Engineering

The following are the members of the Board of Studies for the Department of Civil Engineering, as approved by the Academic Council.

S.No.	BoS Members Description	Name of the Member and Designation
1	I/C Head of the Department (Chair Person)	Dr. S. V. Narsi Reddy, Assistant Professor.
2	Faculty Members from the Department	1. Dr. Mohd. Hamraj, Professor & Dean (Academics)
		2. Mr. Shakeel Ayjaz, Associate Professor
		3. Dr. Qamra Sultana, Associate Professor
		4. Mr. M. Sanjay, Assistant Professor
3	Subject experts from outside the parent University	1. Dr. Binaya Patnaik, Associate Professor and Controller of Examinations, NICMAR University of Construction Studies, Hyderabad
		2. Dr. S. Ashok Kumar, Associate Professor, Department of Civil Engineering, Malla Reddy University, Hyderabad.
4	Expert member nominated by Vice Chancellor and recommended by College Principal	Prof. K. Shashikanth, Chairman, Board of Studies (Civil Engineering), Osmania University.
5	Representative from Industry	Smt. P. Koundinya, Director, Peketi Ventures Pvt. Ltd. Hyderabad.
6	MJCET College Alumni nominated by the college Principal	Mr. Zameer Ahmed, Director (Technical), National Consultancy for Planning & Engineering, Hyderabad.

FOR PEKETI VENTURES PVT. LTD. Director

PROFESSOR
Department of Civil Engineering
University College of Engineering
(Autonomous)
Osmania University, Hyderabad-500 007.

S.V.N.Reddy 28/7/26.
BOS CHAIRMAN

I/C HEAD
DEPT. OF CIVIL ENGINEERING
MUFFAKHAM JAH COLLEGE OF ENGG. & TECH
Road No: 3, Banjara Hills, Hyderabad-34.

Dean (Academics)
MJCET

PRINCIPAL
PRINCIPAL
Muffakham Jah College Of Engineering & Technology
Banjara Hills, Road No. 3,

MUFFAKHAM JAH COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)
DEPARTMENT OF CIVIL ENGINEERING

CED/BOS/July/2026/1 Date:28.07.2026

Minutes of the Board of Studies Meeting held for the finalization of the B.E. Civil Engineering Scheme of Instruction under R25 Regulations

Time: 11:00 AM – 12:00 PM

Venue: Department of Civil Engineering, Hybrid Mode

Members Present

S.No.	BoS Members Description	Name of the Member and Designation
1	I/C Head of the Department (Chair Person)	Dr. S. V. Narsi Reddy, Assistant Professor.
2	Faculty members from the department	1. Dr. Mohd. Hamraj, Professor & Dean (Academics)
		2. Mr. Shakeel Ayjaz, Associate Professor
		3. Dr. Qamra Sultana, Associate Professor
		4. Mr. M. Sanjay, Assistant Professor
3	Subject experts from outside the parent University	1. Dr. Binaya Patnaik, Associate Professor and Controller of Examinations, NICMAR University of Construction Studies, Hyderabad
		2. Dr. S. Ashok Kumar, Associate Professor, Department of Civil Engineering, Malla Reddy University, Hyderabad.
4	Expert member nominated by Vice Chancellor and recommended by college Principal	Prof. K. Shashikanth, Chairman, Board of Studies (Civil Engineering), JNTUH & Controller of Examinations, Osmania University.
5	Representative from Industry	Sri. P. K. Chaitanya, Director, Peketi Ventures Pvt. Ltd. Hyderabad.
6	MJCET College Alumni nominated by the college Principal	Mr. Zameer Ahmed, Director (Technical), National Consultancy for Planning & Engineering, Hyderabad.

Proceedings

The meeting commenced at 11:00 AM with the Chairperson, Dr. S. V. Narsi Reddy, I/C Head, Department of Civil Engineering, welcoming all the members of the Board of Studies and expressing his gratitude to the external experts for their valuable presence and suggestions.

The Chairperson presented the proposed Scheme of Instruction for the B.E. Civil Engineering Programme under R25 Regulations and briefed the members on the salient features of the curriculum. He informed the Board that the proposed scheme had been framed in accordance with the AICTE Model Curriculum, National Education Policy (NEP) 2020, UGC guidelines

for Autonomous Institutions, Outcome-Based Education (OBE), Academic Bank of Credits (ABC), NBA and NAAC requirements, industry expectations, multidisciplinary learning, employability requirements, and the needs of higher education and competitive examinations. The Scheme of Instruction was taken up for detailed deliberation, and the following observations and recommendations were recorded.

Item No. 1: Correction of Course Code

The Dean (Academics) observed that the course Drone Technology should be assigned the course code 25SD356EE instead of 25SD356CS, as the course is offered by the Department of Electrical and Electronics Engineering.

Resolution:

The Board recommended correcting the course code accordingly.

Item No. 2: Software Project Management

The expert members sought clarification regarding the inclusion of the course Software Project Management in the curriculum.

The Chairperson explained that the course had been introduced to familiarize Civil Engineering students with software-based project planning and management practices, considering the increasing application of digital tools in the construction industry.

The expert members suggested incorporating additional software-oriented courses or practical components in the curriculum to further enhance students' technical competency and industry readiness.

Resolution:

The department agreed to examine the feasibility of strengthening software-related components while finalizing the curriculum.

Item No. 3: Credit Distribution

The expert members observed that certain theory courses had been assigned four credits and expressed the opinion that three credits may be adequate for such courses. The members further observed that autonomy need not necessarily result in increasing the credit allocation of individual courses.

It was also suggested that, if academically justified, the overall programme credits could be increased to 163–164 credits.

The Chairperson informed the Board that the institution has adopted a policy of maintaining 160 total credits across all undergraduate programmes for uniformity.

Resolution:

The Board recommended reviewing the credit distribution while adhering to the institutional framework governing the total programme credits.

Item No. 4: Water Resources Engineering

The expert members strongly recommended that Water Resources Engineering be offered as a Professional Core course instead of a Professional Elective, considering its importance as a fundamental Civil Engineering subject and its significant weightage in the GATE examination. The members further recommended that subjects having substantial relevance to GATE and other competitive examinations should preferably be included under the Professional Core category.

Resolution:

The department agreed to review the categorization of the course while revising the Scheme of Instruction.

Item No. 5: Open Elective Courses

The expert members suggested that two Open Elective courses would be adequate for the programme and recommended reducing the number of Open Electives from three to two.

Resolution:

The suggestion will be examined while finalizing the Scheme of Instruction.

Item No. 6: Mini Project and Community Service Project

The Board sought clarification regarding the distinction between the Mini Project and the Community Service Project.

The Chairperson explained that the Mini Project is intended to develop students' technical knowledge and problem-solving abilities through discipline-specific applications, whereas the Community Service Project aims to promote community engagement and social responsibility in line with the objectives of NEP 2020.

The expert members expressed the opinion that offering the Mini Project during the IV Semester may not be appropriate, as students may not have acquired adequate technical knowledge by that stage.

The Chairperson further explained that the inclusion of the Mini Project at this stage would also support the Academic Bank of Credits (ABC) framework and facilitate the multiple entry–multiple exit provisions envisaged under NEP 2020.

Resolution:

The Board recommended reviewing the semester placement of the Mini Project while finalizing the curriculum.

Item No. 7: Engineering Geology

The expert members observed that the Engineering Geology topics presently included as part of the Geotechnical Engineering course require reconsideration.

The members suggested that Engineering Geology may either be offered as a separate course or be omitted from the Geotechnical Engineering syllabus instead of including only selected units.

Resolution:

The department agreed to revisit the syllabus structure while finalizing the curriculum.

Item No. 8: Aptitude Training

The expert members emphasized the importance of incorporating Aptitude Training within the curriculum to enhance students' preparedness for GATE, competitive examinations, higher studies, and campus placements.

Resolution:

The department agreed to explore suitable provisions for incorporating aptitude development components in the curriculum.

Item No. 9: Internship Duration

The expert members suggested extending the internship duration from four weeks to eight weeks to provide students with enhanced industrial exposure.

The Chairperson informed the Board that the proposed curriculum provides flexibility for students to undergo internships of four to six weeks, considering the academic schedule and institutional requirements.

Resolution:

The Board noted the suggestion and recommended reviewing the internship duration while finalizing the academic regulations.

General Resolution

The Board appreciated the efforts of the Department in preparing the proposed B.E. Civil Engineering Scheme of Instruction under R25 Regulations and offered valuable suggestions for further strengthening the curriculum.

After detailed deliberations, it was resolved that the recommendations made by the expert members would be examined and incorporated, wherever found appropriate and consistent with institutional policy and statutory guidelines, before placing the revised Scheme of Instruction before the Academic Council for consideration and approval.

There being no other item on the agenda, the meeting concluded with a vote of thanks proposed by the Chairperson.

For PERETI VENTURES PVT. LTD. Director

S.V.N. Reddy
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DEPT. OF CIVIL ENGINEERING
MUFFAKHAM JAH COL... & TECH
Road No: 3, Banjara Hills, Hyderabad-34.

Dean (Academics)
MJCET

S.V.N. Reddy
Chairperson
Board of Studies in Civil Engineering

I/c HEAD
DEPT. OF CIVIL ENGINEERING

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MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY

SCHEME OF INSTRUCTION & EXAMINATION B.E Civil w.e.f 2025-26

B.E Civil Engineering Department

SEMESTER III (SECOND YEAR)											
S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hrs	
Theory Courses										
1	25BS214MT	Partial Differential Equations and Complex Variables	3	-	-	3	40	60	3	3
2	25PC211CE	Building Materials and Construction	3	-	-	3	40	60	3	3
3	25PC212CE	Surveying and Geomatics	3	-	-	3	40	60	3	3
4	25PC213CE	Strength of Materials	3	1	-	4	40	60	3	4
5	25PC214CE	Fluid Mechanics	3	-	-	3	40	60	3	3
Practical/ Laboratory Courses										
6	25PC251CE	Building Drawing & Drafting Laboratory	-	-	2	2	40	60	3	1
7	25PC252CE	Surveying Laboratory	-	-	2	2	40	60	3	1
8	25PC253CE	Fluid Mechanics Laboratory	-	-	2	2	40	60	3	1
9	25SD254EC	Internet of Things (SDC)	-	-	2	2	50	-	-	1
		Total	**15**	**1**	**8**	**24**	**370**	**480**		**20**

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

*GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

Dean (Academics) MJCET

For PEKETI VENTURES PVT. LTD. Director

S. V. N. Reddy HEAD DEPT. OF CIVIL ENGINEERING MUFFAKHAM JAH COLLEGE OF ENGG. & TECH Road No: 3, Banjara Hills, Hyderabad-34.

PROFESSOR Department of Civil Engineering University College of Engineering (Autonomous) Osmania University, Hyderabad-500 007.

(Mr. M. SANJAY)

Approved in the BOS
held on 28 / 07 / 2026

25BS214MT PARTIAL DIFFERENTIAL EQUATIONS AND COMPLEX VARIABLES

Course Category	Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	MDC, DNM	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand Lagrange's equation and Charpit's method.
2. Perform Fourier series for a given range.
3. Understand wave equation, heat equation and Laplace equation.
4. Understand Limit, Continuity and Analyticity of complex variables.
5. Apply Cauchy's theorem and Cauchy's integral formula.

Course Outcomes

COs	Statements	Blooms Level
CO1	Formation of Partial Differential Equations.	L3
CO2	Obtain the Fourier series for a given function.	L3
CO3	Determine the solution of a PDE by the method of separation of variables.	L3
CO4	Examine analyticity in Cartesian and Polar forms.	L4
CO5	Evaluate contour integrals of functions of complex variables.	L3

Course Content

UNIT I

Partial Differential Equations:
Formation of Partial Differential Equation, First order Partial Differential Equation, Solution of first order linear Partial Differential Equation, Lagrange's equation, Non-linear first order Partial Differential Equation, Charpit's method.

UNIT II

Fourier Series:
Even and Odd functions, Dirichlet's conditions, Expansion of a function for a given range $(0,2\pi)$, $(-\pi,\pi)$, $(0,2l)$, $(-l,l)$. Half-range Sine and Cosine expansions.

UNIT III

Applications of Partial Differential Equations:
Second order linear Partial Differential Equation and their classification, Method of separation of variables, vibrations of stretched string wave equation, one-dimensional heat equation, solution of Laplace's equation.

UNIT IV

Limit, Continuity of a function, Analytic function, Cauchy – Riemann Equations (Both Cartesian and Polar forms), Harmonic function.

UNIT V

Complex integration, Cauchy's theorem, Cauchy's integral formula, Taylor's series, Laurent's series.

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Text books and Reference Books	1. R.V.Churchill, "*Complex variables and it's applications*", McGraw Hill, 2017, 8th Edition.. 2. Dennis G.Zill, "*Advanced Engineering Mathematics*", Jones & Bartlett Learning, 2018, 6th Edition. 3. M.D.Rai Singhania, "*Ordinary and Partial Differential Equations*", S.Chand and Co., 2024, 20th Edition.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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Approved in the BOS
held on 28 /07 /2026

25PC211CE BUILDING MATERIALS AND CONSTRUCTION

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Basic knowledge of various construction materials and methodology, technical knowledge regarding the types of buildings and their construction.	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand physical properties, uses, manufacturing processes of building materials that are used in structural components.
2. Illustrate the application of protective materials for structural members.
3. Demonstrate different types of construction procedures for different components of a building.

Course Outcomes

COs	Statements	Blooms Level
CO1	Classify the types of construction materials like bricks, stones, steel, timber and their uses.	L2
CO2	Demonstrate the composition, properties and tests of cement and aggregates.	L2
CO3	Explain the manufacturing of concrete, properties and tests of fresh & hardened concrete.	L2
CO4	Discuss the types, properties of miscellaneous building materials like pointing, white & color washing, plastering, paints, varnishes, flooring, glass, bitumen etc.	L3
CO5	Illustrate the importance of energy conservation, damp proof coarse and fire protection in buildings.	L3

Course Content

UNIT I

***Stones*:** Uses of stones as building materials. Characteristics of good building stones. Classification of stones. Quarrying, various methods. Dressing and polishing of stones.

***Bricks*:** Composition of brick clay. Methods of manufacturing bricks. Preparation of brick earth. Tempering, Pug mill. Various steps of moulding, drying and method of burning of bricks; clamps, intermittent and continues kilns, Bull's trench kiln, Hoffman's kiln. Characteristics of good building bricks, classification of bricks. Introduction to light weight bricks.

***Building Blocks*:** Hollow building blocks for walls and roofing. Load bearing and non-load bearing blocks. Provisions of IS 2572. Manufacturing process of Fly ash bricks.

UNIT II

***Cement*:** Chemical composition of the ingredients for manufacturing cement. Outline of manufacturing process, flow diagram. Tests on cement. IS:269 specifications for Ordinary Portland Cement, various types of cements.

***Blended Cements*:** Various type and their uses.

	Fine Aggregate*:** Characteristics of good mortar sand, availability of sand and its classifications. Alternatives to natural sand. Bulking of sand. ***Coarse Aggregate*:** Characteristics of good coarse aggregates for manufacture of concrete. Test on aggregates. Light weight aggregates **UNIT III** ***Mortar*:** Different types of mortars, preparation, setting and curing. Manufacturing methods of mortar. ***Concrete*:** Batching, mixing, transporting, compacting and curing, Ready-mix concrete. ***Reinforcing steel*:** Types of reinforcement, specifications, storage and handling. **UNIT IV** ***Timber*:** Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Laminates and their uses. ***Paints, Varnish and Distemper*:** Constituents, characteristics of good paints, Bases, vehicles, thinners and coloring pigments. Painting of different types of surfaces; types of varnish, and application. Types of distemper, and application. ***Emerging Building Materials*:** Energy conservation in buildings. Recycled materials, local materials and industrial waste products as a means of sustainable development, Glass, composites and smart materials. **UNIT V** ***Form work and scaffolding*:** Requirements, types, materials, accessories, reuses and maintenance. ***Floors*:** Characteristics of good floors. Common types of floors. Stone flooring, concrete flooring, terrazzo flooring. Ceramic and mosaic tiles. Industrial floors. Methods of construction and maintenance. ***Plastering, Pointing and White / Color Washing*:** Types of plastering, preparation of surfaces, and defects. Types of pointing, preparation of surfaces. Preparation and application of white wash and colour wash. ***Fire protection in structures*:** Classification of fire, general causes of fire, detection of fire, methods for fire control, Analysis for structural components for fire resistance (wood, steel, concrete and masonry). ***Damp Proofing: Causes of dampness, effects of dampness, methods of proofing.
Text books and Reference books	**Text Books:** 1. VN. Vazirani, and S.P. Chandola, *Engineering Materials,* Khanna Publishers 1993. 2. Sushil Kumar, *Building Construction*, Standard Publilshers 1992. S.P. Arora and S.P. Bindra, *Text book on Building Construction*, Dhanpath Raj Publications, 1999. 3. National Building Code of India, 2005. 4. Gurucharan Singh, *Building materials and construction*, Standard book house, 2010 5. Central Building Research Institute, *Advances in Building Materials and*

Construction, Roorkee, 2004.

Reference Books:

6. IS 432: 1982, *Indian Standard Specification for Mild Steel and Hard-Drawn Steel Wire for Concrete Reinforcement,* Part I and II, Bureau of Indian Standards, New Delhi, 1982.
7. IS 1077: 1992, *Indian Standard Common Burnt Clay Building Bricks_ Specification,* Bureau of Indian Standards, New Delhi, 1992.
8. IS 1786: 1985 *Indian Standard Specification for High Strength Deformed Steel Bars and Wires for Concrete Reinforcement, Bureau of Indian Standards, New Delhi, 1985.*
9. IS 2117 : 1991, *Indian Standard Guide for Manufacture of Hand-made Common Burnt Clay Building Bricks,* Bureau of Indian Standards, New Delhi, 1991.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

PROFESSOR
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Approved in the BOS
held on 28 /07 /2026

25PC212CE SURVEYING & GEOMATICS

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Engineering Mathematics, Engineering Graphics, Basic Civil of Engineering.	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand the fundamental principles of surveying, linear and angular measurements, and the use of conventional surveying instruments for engineering applications.
2. Develop the ability to perform levelling, compute reduced levels, areas, and volumes, and apply these techniques in civil engineering projects.
3. Apply the principles of theodolite surveying and trigonometric levelling for accurate measurement of angles, elevations, and coordinates.
4. Analyze the geometric principles of horizontal and vertical curves and apply suitable methods for setting out curves in transportation and construction projects.
5. Acquire knowledge of modern surveying technologies such as Electronic Distance Measurement (EDM), Total Station, and Photogrammetry for efficient collection and processing of spatial data.

Course Outcomes

COs	Statements	Blooms Level
CO1	Explain the principles of surveying and perform linear, angular, and plane table surveying for engineering applications.	L3
CO2	Apply levelling techniques to determine elevations and compute areas and volumes using standard methods.	L3
CO3	Perform theodolite surveying and trigonometric levelling for determining angles, distances, coordinates, and elevation.	L4
CO4	Set out simple horizontal and vertical curves used in transportation and civil engineering projects.	L3
CO5	Apply modern surveying techniques using photogrammetry, EDM, and Total Station for accurate field data collection and engineering applications.	L4

Course Content

UNIT I

Classification and principles of surveying.

Linear Measurements: Accessories for linear measurements; Principle of Chain surveying; Offset; Cross staff.

Angular Measurements: Principle, Types of meridians; Bearing systems and conversions; magnetic declination; Fore & Back Bearings; definition of local attraction; Traversing - Open & Closed traverse.

Plane Table surveying: Principle and Accessories of Plane Table; Advantages & Disadvantages of Plane tabling.

UNIT II

Levelling: Principle, Definitions; Dumpy and Auto level; Temporary Adjustment of level. Types of levelling operations: Fly levelling, check

	levelling, Curvature & refraction corrections; Sensitiveness of bubble tube; Calculation of reduced level - HI & Rise and fall methods. **Areas & Volumes:** Computation of Areas - Using Simpson's and Trapezoidal rule; **Computation of Volumes:** Using Simpson's and Trapezoidal rule for a Level Section. **UNIT III** **Theodolite Survey:** Introduction to Theodolite; Definitions; Fundamental lines of a Theodolite; Temporary Adjustments; Measurement of horizontal and vertical angle; Coordinates & their computations, Omitted measurements; Trigonometric levelling: Calculations of elevations and distances of accessible and inaccessible objects by single and double plane methods. **UNIT IV** **Curves**: Theory of simple curves, setting out of simple curves by linear and angular methods; Elements of simple, compound & Reverse curves; Elements of Transition curve: length of transition curve; Vertical Curves-Types of vertical curves – Length of vertical curve. **UNIT V** **Photogrammetric Surveying:** Vertical, Tilted and oblique photographs; Flying height and Scale of a Vertical Photograph. **Electronic Distance Measurement:** Principle and Types of EDM instruments. **Total Station:** Parts of a Total Station, Advantages and Applications; Field Procedure for total station survey.
Text books	**Textbooks:** 1. B.C. Punmia, Surveying Vol.1, 2 & 3, Lakshmi Publishers, NewDelhi,1994. 2. Basak, N. N. Surveying & Levelling. McGraw-Hill Education, 1994. 3. Arora K.R., Surveying Vol. 1 & 2, Standard Book House. New Delhi, 2005. 4. T.M. Lillesand and R.W. Kiefer, Remote Sensing and Image Interpretation, John Wiley & Sons,1994.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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25PC213CE STRENGTH OF MATERIALS

Course Category	Professional Core	**Credits**	4
Course Type	Theory	**Lecture – Tutorial –Practical**	3-1-0
Prerequisite	Engineering Mechanics	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand the concepts of stress, strain, elastic constants, compound bars, and temperature stresses.
2. Analyze shear force and bending moment in statically determinate beams under various loading conditions.
3. Determine bending and shear stresses in beams using the theory of simple bending.
4. Analyze propped cantilever beams and evaluate their structural response.
5. Analyze torsion in circular shafts and the behavior of different types of springs under loading.

Course Outcomes

COs	Statements	Blooms Level
CO1	Explain the concepts of stress, strain, elastic constants, compound bars, and temperature stresses for engineering materials.	L2
CO2	Analyze statically determinate beams and construct shear force and bending moment diagrams under different loading conditions.	L4
CO3	Determine bending and shear stresses in beams using the theory of simple bending and shear stress distribution.	L3
CO4	Analyze propped cantilever beams to determine reactions, shear forces, and bending moments under different loading conditions.	L4
CO5	Apply the principles of torsion and spring mechanics to determine stresses, deformation, and power transmission in engineering components.	L3

Course Content

UNIT I

Simple Stresses and Strains:

Definitions of stresses and strains, Hooke's Law, Modulus of Elasticity, Stress- Strain curve for ductile materials, Elastic constants, compound bars and temperature stresses. Stress - Strain diagram for Mild Steel.

UNIT II

Shear Force and Bending Moment in Statically Determinate Beams:

Concept of Shear Force and Bending Moment, Sign Conventions. Shear force and Bending Moment Diagrams for cantilevers, simply supported, overhanging beams subjected to concentrated load, distributed & varying load, Point of contra flexure.

UNIT III

Bending Stresses in Beams:

Theory of simple bending, Assumptions, Relationship between bending stresses and radius of curvature, Relationship between moment and radius of curvature.

Shear Stresses in Beams:

	Introduction, Shear stresses across Rectangular, Circular, T and I sections. **UNIT IV** **Propped Cantilevers:** Cantilever beams on elastic and rigid props for point loads and uniformly distributed load only. Calculation of reactions, Bending moment and Shear force diagrams. **UNIT V** **Torsion of Circular Shafts:** Introduction, Torsion Equation, Assumptions, Torsion Rigidity, Power Transmitted by a Shaft, Modulus of Rupture. **Springs:** Close and open coiled helical springs under axial load and axial twist, Carriage springs.
Text books and Reference books	**Textbooks:** 1. R. C. Hibbler, "Mechanics of Materials (SI Edition),"9th Edition, Pearson, 2018. 2. R. K. Bansal, "A Textbook of Strength of Materials: Mechanics of Solids (S.I.Units), 6th Edition,Laxmi Publications Pvt. Ltd., 2018. 3. S. Ramamrutham, R. Narayan, "*Theory of Structures*", Dhanpat Rai Publishing Company Private Limited-New Delhi, 9th edition, 2014. **Reference Books**: 1. Ferdinand P Beer, E. Russell Johnston Jr., John T. DeWolf, David F. Mazurek and SanjeevSanghi, "Mechanics of Materials (SI Edition)," 8th Edition, McGraw-Hill, 2020Dr. R.Vaidyanathan and Dr. P Peruma, *"Structural Analysis Vol. I and II"* Laxmi publications, 3rd edition, 2016. 2. R. Subramanian, "Strength of Materials", 3rd Edition, Oxford University Press,New Delhi, 2016.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO1	3	2	–	–	–	–	–	–	–	–	1	2	1
CO2	3	3	2	2	1	–	–	–	–	–	1	3	2
CO3	3	3	2	2	1	–	–	–	–	–	1	3	3
CO4	3	3	2	2	1	–	–	–	–	–	1	3	2
CO5	3	2	2	1	1	–	–	–	–	–	2	2	3

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25PC214CE FLUID MECHANICS

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Engineering Mechanics.	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. To **develop** a fundamental understanding of the physical properties of fluids, fluid statics, and pressure measurement techniques used in hydraulic engineering.
2. To **explain** the principles of fluid kinematics and fluid dynamics, including continuity, Euler's equation, Bernoulli's equation, and vortex flow, for analysing fluid motion.
3. To enable students to **apply** the fundamental concepts and governing equations of fluid mechanics to solve engineering problems related to fluid flow in civil engineering applications.

Course Outcomes

COs	Statements	Blooms Level
CO1	**Apply** the concepts of fluid properties and hydrostatics to evaluate fluid behavior, pressure distribution, and pressure measurement in engineering applications.	L3
CO2	**Apply** the principles of fluid kinematics, continuity equation, stream function, velocity potential, and flow net concepts to engineering flow problems.	L3
CO3	**Apply** the fundamental principles of fluid dynamics to analyze fluid motion using Euler's and Bernoulli's equations, and evaluate the characteristics of free and forced vortex flows.	L3
CO4	**Apply** the principles of fluid flow measurement to determine velocity and discharge in pipes, tanks, and open channels using appropriate flow-measuring devices.	L3
CO5	**Analyze** compressible fluid flows and its effect on fluid properties, wave propagation, and flow characteristics under isothermal and adiabatic conditions.	L4

Course Content

UNIT I

Fluid Properties: Introduction, density, specific weight, specific volume, specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity, compressibility, bulk modulus, surface tension, capillarity, vapour pressure and cavitation.

Fluid Statics: Fluid pressure at a point, pressure variation in a fluid at rest, Pascal's law, hydrostatic law, absolute, gauge, atmospheric and vacuum pressures, measurement of pressure- manometers, piezometer, U-tube differential manometer, micromanometer, mechanical gauge-bourdon tube pressure gauge.

	UNIT II **Fluid Kinematics:** Introduction, Classification of fluid flow-steady and unsteady flow, uniform and non-uniform flow, laminar and turbulent flow, rotational and irrotational flow, compressible and incompressible flow, ideal and real fluid flow, one, two-and three-dimensional flows. Continuity equation - control volume and three-dimensional fluid flow in Cartesian coordinates, Streamline, pathline, streakline, and stream tube. Stream function, velocity potential function and flownets. **UNIT III** **Fluid Dynamics:** Convective and local acceleration, Surface and body forces, forces causing motion, Euler's equations of motion. Bernoulli's equation, applications of Bernoulli's equation. **Vortex flow**: Definition, free and forced vortex motion equations. **UNIT IV** **Measurement of Velocity**: Pitot tube **Measurement of discharge in pipes:** Venturimeter, orifice meter, nozzle meter, elbow meter and rotameter. **Measurement of Discharge in Tanks**: Mouthpiece and orifice. **Measurement of discharge in open channel flows**: Notches and weirs. **UNIT V** **Compressible Flow**: Compressibility of liquids and gases, Differential form of continuity equation, Bernoulli's energy equation for isothermal and adiabatic conditions, Velocity of pressure wave, wave velocity for adiabatic and isothermal conditions, Mach Number and Mach cone, stagnation pressure, density and temperature.
Text books and Reference books	**Textbooks:** 1. P.N. Modi and S.M. Seth, Hydraulics and Fluid Mechanics Including Hydraulic Machines, Standard Book House, Delhi, 22nd Edition, 2019. 2. R.K. Rajput, Fluid Mechanics and Hydraulic Machines, S. Chand and Company, 2017. **Reference Books**: 1. K. L. Kumar, Engineering Fluid Mechanics, Eurasia Publishing House, 2009. 2. A.K. Jain, Fluid Mechanics including Hydraulic Machines by A.K. Jain Khanna Publishers, Delhi, First Reprint, 2016.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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25PC251CE BUILDING DRAWING & DRAFTING LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Theory	**Lecture – Tutorial –Practical**	0-0-2
Prerequisite	Basic knowledge of AUTOCAD.	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

The objectives of this course is to impart knowledge of:

1. Skill sets to prepare computer aided engineering drawings.
2. Details of construction of different building elements.
3. Visualizing the completed form of the building and the intricacies of construction basedon the engineering drawings.
4. Planning and drawing detailed plan, section and elevation of any structure.

Course Outcomes

COs	Statements	Blooms Level
CO1	Illustrate the basic principles of building planning and drawings as per codal provisions.	L4
CO2	Apply the tools of AUTOCAD software to prepare structural drawings of variousbuilding components	L4
CO3	Draw plan, elevation and sectional drawings of residential, hostel, hospital, schoolbuildings in AutoCAD software.	L6
CO4	Create site drawings of a building.	L6
CO5	Develop detailed steel design of slab and piers of bridges.	L4

Sheet Number	
	UNIT I
	Introduction to AUTOCAD
1	**Staircase** Detailed drawing (plan, section and elevation) of differentforms of staircases – open well and dog legged.
2	**Footings** Detailed drawing (Plan and section) of different types of footings.
	UNIT II
3	**Trusses** Detailed drawing (sectional elevation) of different types of roof trusses – king post, queen post, steel, composite –
4	Detailed elevations and enlarged detail of joints in trusses, Steel Connections detailing, beam to column connection, beam to beam connection – bolt & Weld
	UNIT III
	Building Planning : Classification of buildings, General requirements of site and building. Building codes, Acts and Bye-laws, Licensing of building works. Functional planning of building such as residential, institutional, public, commercial, industrial buildings, checking for circulation, ventilation, structural, preparing sketch plan, working drawing etc.
5 & 6	Simple residential buildings with flat and pitched roof.
7 & 8	School, rural hospital, library and hostel buildings. Five floors apartment building.

9 & 10	Elevations of different buildings.
11	**UNIT IV** Orientation of Site plans, Planning a simple residential building from scratch.
	UNIT V
12	Detailed structural drawing of R.C.C. bridge slab.
13	Detailed structural drawing of R.C.C. bridge piers.

Text books and Reference books	**Text Books:** 1. Gurucharan Singh and Jagdish Singh, *Building planning, designing and scheduling*, Standard Publishers-Delhi,. 2. S.N Lal, "*Engineering Drawing with Introduction to Auto CAD*", Cengage Learning India. 3. Malik R.S., Meo, G.S. (2009) "*Civil Engineering Drawing*", Computech Publication Ltd New Asian. 4. Sikka, V.B. (2013), "*A Course in Civil Engineering Drawing*", S.K.Kataria& Sons. **Reference Books:** 1. M.G. Shah, C.M. Kale and S.Y. Patki, *Building Drawing*, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2009. 2. National Building Code, Bureau of Indian Standards, New Delhi, 2005. 3. IS:962 – 1967 Code of Practice for Architectural and Building Drawing. 4. IS:4021 – 1983 Specification for Timber Door, Window and Ventilator Frames.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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25PC252CE SURVEYING LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Theory	**Lecture – Tutorial –Practical**	0-0-2
Prerequisite	Surveying and Geomatics	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand the fundamental principles and procedures of chain, compass, plane table, and levelling surveys.
2. Develop practical skills in measuring horizontal and vertical angles and determining heights, distances, and elevations using theodolite and related surveying methods.
3. Apply tacheometric surveying techniques for determining distances, elevations, and instrument constants from field observations.
4. Develop proficiency in modern surveying techniques using Total Station for measurement of angles, distances, reduced levels, and areas.
5. Develop field surveying skills involving systematic observation, recording, computation, analysis of survey data, teamwork, and preparation of technical field reports.

Course Outcomes

COs	Statements	Blooms Level
CO1	Perform chain surveying and levelling operations to determine distances, areas, and reduced levels using conventional surveying instruments.	L3
CO2	Measure horizontal and vertical angles using theodolite and solve engineering problems related to height, distance, and elevations by trigonometric levelling.	L3
CO3	Conduct tacheometric surveys to determine distances, elevations, and tacheometric constants for field applications.	L3
CO4	Operate Total Station to determine coordinates, reduced levels, heights, distances, and areas for engineering surveys.	L3
CO5	Analyze field observations, perform survey computations, and prepare accurate survey records while demonstrating teamwork and professional ethics.	L4

Course Content

List of experiments:

1. Find out the area using chain and cross staff surveying.
2. Find out the area of polygon using prismatic compass.
3. Plane table survey: Radiation & Intersection methods.
4. Introduction to Levelling: Differential levelling using dumpy/Auto level.
5. Levelling: Fly levelling using Dumpy/Auto level.
6. Measurement of horizontal angles by repetition methods.
7. Measurement of horizontal angles by reiteration methods.
8. Single plane method: Determination of R.L. of an elevated Object using two Instrument Stations which are placed in a same vertical plane- when the base of the Object is inaccessible.
9. Two plane method: Determination of R.L. of an elevated Object using two Instrument Stations which are not placed in the same vertical plane- when

	base of the Object inaccessible. 10. Stadia Fixed Hair, Determination of constants "K" & "C". 11. Tacheometer ; one elevation one depression 12. Introduction to Total station and applications: Application to simple problems of height and distance by measuring angle of elevation and depression and determination of R.L of the target object. 13. Total station and applications: Determination of area enclosed in a closed traverse having minimum 5 stations. **Note:** At least 8 experiments must be performed during the semester
Suggested Reading	1. **Virtual Labs – Surveying Lab, IIT Roorkee** https://sl-iitr.vlabs.ac.in/Objective.html 2. **NPTEL – Surveying, IIT Kanpur** https://www.youtube.com/watch?v=chhuq_t40rY 3. **NIT Calicut – Surveying Laboratory** https://nitc.ac.in/department/civil-engineering/pages/surveying-lab 4. **Gati Shakti Vishwavidyalaya – Surveying Laboratory** https://gsv.ac.in/surveying-lab/ 5. • **NITK Surathkal – Surveying Practice** https://civil.nitk.ac.in/course/surveying-practice-cv265

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

	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
CO 1	3	3	–	2	3	–	–	2	1	–	1	3	2	3
CO 2	3	3	–	3	3	–	–	2	1	–	1	3	2	3
CO 3	3	3	–	3	3	–	–	2	1	–	1	3	2	3
CO 4	3	3	–	3	3	–	–	2	1	–	1	3	2	3
CO 5	3	3	2	3	3	1	–	2	2	1	2	3	3	3

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25PC253CE FLUID MECHANICS LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Practical	**Lecture – Tutorial –Practical**	0-0-2
Prerequisite	Fluid Mechanics	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Students should be able to verify the principles studied in fluid mechanics.
2. To calibrate various flow measuring devices by determining coefficient of discharge.
3. Verification of Bernoulli's principle and to identify laminar and turbulent flow

Course Outcomes

COs	Statements	Blooms Level
CO1	1. **Compute** discharge flowing through streams and canals.	L3
CO2	2. **Determine** discharge through pipes and losses in pipes.	L3
CO3	3. **Apply** Bernoulli's principle in hydraulics	L3
CO4	4. **Determine** discharge flowing through tanks and open channels.	L3
CO5	5. **Identify** the type of flow in pipe a pipe.	L3

Course Content

LIST OF EXPERIMENTS

1. Determination of coefficient of discharge of a Rectangular Notch with end contractions.
2. Determination of coefficient of discharge of a Circular orifice.
3. Determination of coefficient of discharge of a Mouth piece.
4. Determination of coefficient of discharge of V- Notch.
5. Determination of coefficient of discharge of a Venturimeter.
6. Determination of coefficient of discharge of an Orifice meter.
7. Classification of flow by Reynold's Experiment.
8. Determination of Darcy's friction factor.
9. Verification of Bernoulli's theorem.
10. Study of free Vortex flow.

Text books and Reference books

Textbooks:

1. S. K. Som, and Biswas. G, "Fluid Mechanics and Fluid Machines", Tata McGraw-Hill Publishing Co., New Delhi, 1998.
2. Yuan, S. W., "Foundation of Fluid Mechanics", Prentice-Hall India Pvt. Ltd., New Delhi, 1976.
3. C. S. P. Ojha, R.Berndtsson, P.N. Chandramouli, "Fluid Mechanics and Machinery", Oxford University Press, New Delhi, 2010.
4. A. K. Mohanty, "Fluid Mechnics", Prentice-Hall India Pvt. Ltd., New Delhi, 1994.
5. P. N. Modi, "Hydraulics and Fluid Mechanics Including Hydraulics Machines", Standard Book House, New Delhi, 2013.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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CO 2	3	--	3	--	--	--	--	--	--	--	--	2	--
CO 3	3	--	3	--	--	--	--	--	--	--	--	2	--
CO 4	3	--	3	--	--	--	--	--	--	--	--	2	--
CO 5	3	--	3	--	--	--	--	--	--	--	--	2	--

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25SD254EC INTERNET OF THINGS

Course Category	Skill Development Course	Credits	1
Course Type	Theory	Lecture – Tutorial –Practical	0-0-2
Prerequisite		Sessional Evaluation	50
		Semester End Exam. Evaluation	-
		Total Marks	50

Course Objectives

The course is taught with the objectives of enabling the student to:

1. Understand the fundamentals of embedded IoT systems by interfacing sensors, actuators, and peripheral devices using ESP32/Arduino/Raspberry Pi.
2. Develop embedded programs to acquire, process, and display sensor data using appropriate programming techniques and hardware interfaces.
3. Implement wireless communication protocols and cloud platforms for remote monitoring and control of IoT devices.
4. Design IoT-based applications by integrating hardware, networking, cloud services, and mobile/web interfaces to solve real-world engineering problems.
5. Develop teamwork, problem-solving, and project implementation skills through the design and realization of an end-to-end IoT system.

Course Outcomes

COs	Statements On completion of this course, the student will be able to:	Blooms Level
CO1	Interface and program digital input/output devices, sensors, actuators, and display modules using ESP32/Arduino/Raspberry Pi.	L2
CO2	Acquire, process, and display sensor data using embedded programming and hardware interfacing techniques.	L2
CO3	Develop wireless IoT applications using Bluetooth and Wi-Fi for remote monitoring and control.	L2
CO4	Implement cloud-based IoT applications for sensor data acquisition, visualization, and remote device management.	L3
CO5	Design and demonstrate an end-to-end IoT application by integrating embedded hardware, communication, cloud, and user interfaces.	L3

Course Content

List of Experiments

1. Interface an LED with ESP32/Arduino/Raspberry Pi and write a program to blink the LED using digital output.
2. Interface a Push Button with ESP32/Arduino/Raspberry Pi and write a program to control an LED based on the button state.
3. IR/LDR Sensor Interfacing: Interface an IR or LDR sensor with ESP32/Arduino/Raspberry Pi and write a program to detect an object/light intensity and control an LED accordingly.
4. Interface a 16×2 LCD (I2C) with ESP32/Arduino/Raspberry Pi and write a program to display text and sensor readings.
5. Interface a DHT11 Temperature and Humidity Sensor with

	ESP32/Arduino/Raspberry Pi and display the measured values on the Serial Monitor/LCD.
	6. Interface a Relay Module with ESP32/Arduino/Raspberry Pi and write a program to control a DC motor or AC load using a push button or sensor input.
	7. Develop a Bluetooth Low Energy (BLE) or Bluetooth Serial application using ESP32 to control an LED or relay from a smartphone.
	8. Interface an HC-SR04 Ultrasonic Sensor with ESP32/Arduino/Raspberry Pi and measure the distance to an object. Display the measured distance on the Serial Monitor/LCD.
	9. Acquire temperature and humidity data from the DHT11 sensor using ESP32 and upload the sensor readings to the ThingSpeak Cloud. Visualize and analyze the data using ThingSpeak charts.
	10. Develop a mobile-based IoT application using ESP32 to remotely monitor temperature and humidity and control an LED or relay through the Blynk IoT mobile dashboard.
	11. Develop an embedded web server on ESP32 to monitor sensor data and control an LED/relay through a web browser over a Wi-Fi network.
	Mini Project: Students shall implement a complete domain-specific IoT application (Smart Home, Smart Agriculture, Smart Energy Monitoring, Smart Environment Monitoring, Smart Healthcare, etc.) using ESP32/Arduino/Raspberry Pi, integrating sensors, actuators, wireless communication, and cloud/mobile monitoring.
Text books and Reference books	**Reference Books** 1. Michael Margolis – *Arduino Cookbook* 2. Simon Monk – *Programming Arduino: Getting Started with Sketches* 3. John Boxall – *Arduino Workshop* 4. Neil Cameron – *ESP32 Essentials* 5. Simon Monk – *Programming the Raspberry Pi: Getting Started with Python* **Online Resources** 1. ThingSpeak Documentation: https://www.mathworks.com/help/thingspeak/ 2. Blynk IoT Documentation: https://docs.blynk.io/ 3. Arduino Documentation: https://docs.arduino.cc/ 4. Arduino-ESP32 Documentation: https://docs.espressif.com/projects/arduino-esp32/ 5. ESP-IDF Documentation: https://docs.espressif.com/projects/esp-idf/ 6. Raspberry Pi Documentation: https://www.raspberrypi.com/documentation/

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

CO 2	3	3	2	2	3	-	-	-	1	-	2	2	1
CO 3	3	2	3	2	3	-	1	-	1	1	2	2	1
CO 4	3	3	3	3	3	-	1	-	1	1	2	2	2
CO 5	3	3	3	3	3	2	2	1	3	2	3	3	2

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MUFFAKHAM JAH COLLEGE OF ENGINEERING & TECHNOLOGY

SCHEME OF INSTRUCTION & EXAMINATION B.E Civil w.e.f 2025-26

B.E Civil Engineering Department

SEMESTER IV (SECOND YEAR)											
S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hours	
Theory Courses										
1	25HS221CM	Business Finance and Accounting	3	-	-	3	40	60	3	3
2	25PC221CE	Concrete Technology	3	-	-	3	40	60	3	3
3	25PC222CE	Structural Analysis	3	1	-	4	40	60	3	4
4	25PC223CE	Hydraulic Engineering	3	-	-	3	40	60	3	3
5	25PC224CE	Hydrology & Water Management	3	-	-	3	40	60	3	3
Practical/ Laboratory Courses										
6	25PC255CE	Concrete Technology Laboratory	-	-	2	2	40	60	3	1
7	25PC256CE	Materials Testing Laboratory	-	-	2	2	40	60	3	1
8	25PC257CE	Hydraulic Engineering Laboratory	-	-	2	2	40	60	3	1
Experiential Learning Course										
9	25PW259CE	Mini Project / Community Service Project	-	-	6	6	40	60	3	3
		Total	**15**	**1**	**12**	**28**	**360**	**540**		**22**

Note 1: Community Service Project (**NBA Criterion 9** Student Support System)

Note 2: **Criterion 3** Research, Innovations and Extension Activities

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

*GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

Dean (Academics) MJCET

For KETI VENTURES PVT. LTD. Director

HEAD DEPT. OF CIVIL ENGINEERING MJCET

PROFESSOR Department of Civil Engineering University College of Engineering (Autonomous) Osmania University, Hyderabad-500 007.

(Mr. M. SANJAY)

Approved in the BOS
held on 28/07/2026

25HS221CM BUSINESS FINANCE AND ACCOUNTING

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-3
Prerequisite	-	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Basic understanding of Financial and Accounting aspects of a business unit.
2. Inputs to evaluate the viability of projects.
3. Skills necessary to analyse the financial statements.

Course Outcomes

After successful completion of the course the students will be able to:

COs	Statements	Blooms Level
CO1	**Evaluate** the financial performance of the business unit.	L3
CO2	**Take decisions** on selection of projects.	L3
CO3	**Compute** the procurement of finances.	L4
CO4	**Analyze** the liquidity, solvency and profitability of the business unit.	L3
CO5	**Valuate** the overall financial functioning of an enterprise.	L4

Course Content

UNIT I

Basics of Accounting: Financial Accounting–Definition- Accounting Cycle – Journal - Ledger and Trial Balance-Cash Book-Bank Reconciliation Statement (including Problems)

UNIT II

Final Accounts: Trading Account-Concept of Gross Profit- Profit and Loss Account Concept of Net Profit- Balance Sheet (including problems with minor adjustments)

UNIT III

Financial System and Markets: Financial System-Components-Role-Considerations of the investors and issuers- Role of Financial Intermediaries. Financial Markets-Players- Regulators and instruments - Money Markets Credit Market- Capital Market (Basics only)

UNIT IV

Basics of Capital Budgeting techniques: Time Value of money- Compounding-DiscountingFuture Value of single and multiple flows- Present Value of single and multiple Flows- Present Value of annuities- Financial Appraisal of Projects– Payback Period, ARR- NPV, Benefit Cost Ratio, IRR (simple ratios).

UNIT V

Financial statement Analysis: Financial Statement Analysis- Importance-Users-Ratio Analysis- liquidity, solvency, turnover and profitability ratios.

Text books and Reference books

Textbooks:

1 Satyanarayana. S.V. and Satish. D., Finance and Accounting for Engineering, Pearson Education
2 Rajasekharan, Financial Accounting, Pearson Education
3 Sharma.S.K. and Rachan Sareen, Financial Management, Sultan Chand
4 Jonathan Berk, Fundamentals of Corporate Finance, Pearson Education
5 Sharan, Fundamentals of Financial Management, Pearson Education

25CP205CE CONCRETE TECHNOLOGY

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Building Materials and Construction Practices & Strength of Materials	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. To understand the properties of cement, fine aggregates and course aggregates.
2. To understand the behaviour of fresh and hardened concrete.
3. To understand the different types of admixtures and their uses.
4. To design the concrete mix.
5. To learn different types of special concretes.

Course Outcomes

COs	Statements	Blooms Level
CO1	Identify the properties of cement, fine aggregates and course aggregates.	L2
CO2	Identify the properties of fresh and Hardened Concrete.	L2
CO3	Distinguish different chemical and mineral admixtures as per their applications.	L3
CO4	Design the concrete mix as per the IS codes.	L5
CO5	Differentiate special concretes depending on their constituents and specific application.	L4

Course Content

UNIT I

***Cement*:** Chemical composition of Portland cement – Hydration of cement and hydration products – Heat of Hydration and Rate of hydration – Tests on physical properties of cement – Different grades of cement – Types of cements.

***Aggregates*:** Classification of aggregates – Particle shape & texture – Bond, Strength & other mechanical properties of aggregates – Specific gravity, Bulk density, Porosity, adsorption & moisture content of aggregate – Bulking of sand – Soundness of aggregate – Alkali Aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading of fine & coarse Aggregates – Gap graded aggregate – Maximum aggregate size.

UNIT II

***Fresh Concrete*:** Workability – Factors affecting workability – tests on workability – Setting times of concrete – Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete – revibration – curing of concrete – types of curing.

***Admixtures*:** Types of admixtures – mineral and chemical admixtures – properties – applications and its effect on concrete, water reducing agents.

UNIT III

***Hardened Concrete*:** Water/Cement ratio – Abram's Law – Gel space ratio –

	effective water in the mix – short term and long term properties of hardened concrete – stress strain curves of concrete. ***Testing of Hardened Concrete*:** Compression tests – Tension tests – Flexure tests – Non- destructive testing methods – Rebound hammer test – ultrasonic pulse velocity test. ***Durability of concrete*:** Factors affecting durability – effect of frost – concreting in cold weather and hot weather. **UNIT IV** ***Mix Design*:** Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical Quality control – Acceptance criteria – Proportioning of concrete mix – IS method of mix design – British and ACI method (theoretical background). **UNIT V** ***Special Concretes*:** High strength concrete, Ferro cement mass concrete, light weight concrete, high density concrete, polymer concrete self-compacting concrete, nano concrete, recycled aggregate concrete, geo-polymer concrete fibre reinforced concrete, shotcrete.
Text books and Reference books	**Text Books:** 1. M.S. Shetty – *Concrete Technology* – S. Chand & Co., Revised Edition, 2006. 2. M.L. Gambir —*Concrete Technology* – Tata Mc. Graw Hill Publishers, New Delhi, 5th Edition, 2017. **Reference Books:** 1. A.M.Naville —*Properties of Concrete* – Pearson Education India,5th edition, 2012 2. A.R. Santha Kumar —*Concrete Technology*‖, Oxford university Press New Delhi 3. P.K.Metha and J.M.Monteiro —*Concrete: Micro structure, Properties and Materials* -, Tata Mc-Graw Hill Education. 4. IS 10262: 2019 —*Concrete Mix Proportioning — Guidelines* (Second Revision) 5. IS 456 (2000): —*Plain and Reinforced Concrete - Code of Practice*" *6.* IS 269:1989 – *Specification for Ordinary Portland Cement* *7.* IS 516:1959 *Method of test for Strength of Concrete* 8. IS 2386(Part 1):1963 *Methods of Test for Aggregates for Concrete*: Part 1 Particle Size and Shape 9. IS 2386(Part 2):1963 *Methods of Test for Aggregates for Concrete*: Part 2 Estimation of Deleterious Materials and Organic Impurities 10. IS 2386(Part 3):1963 *Methods of test for Aggregates for Concrete*: Part 3 Specific Gravity, Density, Voids, Absorption and Bulking 11. IS 2386(Part 4):1963 *Methods of test for Aggregates for Concrete*: Part 4 Mechanical Properties 12. IS 2386(Part 5):1963 *Methods of test for Aggregates for Concrete*: Part 5 Soundness 13. IS 2386(Part 6):1963 *Methods of test for Aggregates for Concrete*: Part 6 Measuring Mortar Making Properties of fine Aggregates.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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CO 1	1	1	1	2	-	-	2	-	1	1	-	2	2
CO 2	1	1	1	2	-	-	2	-	1	1	-	2	2
CO 3	1	2	2	1	-	1	1	-	-	1	-	2	1
CO 4	2	3	3	2	1	2	2	1	1	1	-	1	3
CO 5	1	2	1	1	-	2	1	-	-	1	1	2	2

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25PC222CE STRUCTURAL ANALYSIS

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Engineering Mechanics, Strength of Materials	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand the behaviour of statically determinate and indeterminate structures.
2. Learn the application of energy methods for the analysis of beams and trusses.
3. Analyse fixed and continuous beams subjected to different loading conditions.
4. Apply displacement methods for the analysis of continuous beams and portal frames.
5. Develop the fundamental knowledge required for advanced structural analysis and structural design.

Course Outcomes

COs	Statements	Blooms Level
CO1	Apply energy theorems to determine the deflection of beams and trusses.	L3
CO2	Analyze statically indeterminate trusses using flexibility methods.	L4
CO3	Analyze fixed and continuous beams under different loading conditions.	L4
CO4	Apply the Slope-Deflection Method to analyze continuous beams and portal frames.	L3
CO5	Apply the Moment Distribution Method to analyze continuous beams and portal frames.	L3

Course Content

UNIT I

Energy Theorems:

Introduction – Strain energy in linear elastic systems – Expression for strain energy due to axial load, bending moment and shear force – Castigliano's First Theorem – Maxwell's Reciprocal Theorem – Deflection of simple beams and pin-jointed trusses.

UNIT II

Analysis of Indeterminate Structures:

Introduction to statically indeterminate structures – Determination of static and kinematic indeterminacies – Analysis of pin-jointed trusses with up to two degrees of internal and external indeterminacy using the flexibility method – Castigliano's Second Theorem.

UNIT III

Fixed Beams:

Introduction to statically indeterminate beams – Analysis of fixed beams subjected to various loading conditions (point loads, uniformly distributed loads and load combinations) – Effect of sinking of supports – Effect of rotation of

	supports – Shear force and bending moment diagrams. **Continuous Beams** Introduction – Clapeyron's Theorem of Three Moments – Analysis of continuous beams (up to three spans) subjected to various loading conditions – Continuous beams with one or both ends fixed – Continuous beams with overhang – Effect of sinking of supports – Shear force and bending moment diagrams. **UNIT IV** **Slope-Deflection Method:** Introduction – Derivation of slope-deflection equations – Analysis of continuous beams with and without support settlement – Analysis of single-bay portal frames without sway. **UNIT V** **Moment Distribution Method** Introduction to Moment Distribution Method – Analysis of continuous beams with and without support settlement – Analysis of single-bay portal frames without sway – Introduction to Matrix Stiffness Method and computer applications in structural analysis.
Text books and Reference books	**Textbooks:** 1. Prof. V. N. Vazirani, Dr. M. M. Ratwani, Dr. S.K. Duggal *"Analysis of Structures–Vol-I & II"*, Khanna Publications, 17th edition, 2012. 2. S. Ramamrutham, R. Narayan, "*Theory of Structures*", Dhanpat Rai Publishing Company Private Limited-New Delhi, 9th edition, 2014. 3. C. S. Reddy, "*Basic Structural Analysis*", Tata McGraw Hill Publishers. 3rd edition, 2017. **Reference Books**: 1. Dr. R.Vaidyanathan and Dr. P Peruma, *"Structural Analysis Vol. I and II"* Laxmi publications, 3rd edition, 2016. 2. Aslam Kassimali, "*Structural Analysis*" Cengage publications, 6th edition, 2020. 3. R.C. Hibbeler, *Structural Analysis*, Pearson Education, Latest Edition. 4. Devdas Menon, *Structural Analysis*, Narosa Publishing House, Latest Edition.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

CO 4	3	3	3	2	3	1	–	1	1	–	2	3	3
CO 5	3	3	3	2	3	1	–	1	1	–	3	3	3

Approved in the BOS
held on 28/07/2026

25PC223CE HYDRAULIC ENGINEERING

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Fluid Mechanics	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. **Understand** the principles of fluid flow through pipes and open channels, including energy losses, dimensional analysis, and hydraulic similitude.
2. **Apply** the concepts of fluid mechanics to analyse flow behaviour in pipelines, open channels, hydraulic turbines, and centrifugal pumps.
3. **Evaluate** the performance of hydraulic machines and solve engineering problems related to fluid flow and hydraulic systems.

Course Outcomes

COs	Statements	Blooms Level
CO1	**Analyse** fluid flow through pipes by evaluating flow regimes, velocity distribution, and major and minor energy losses.	L3
CO2	**Apply** dimensional analysis, similitude principles, and water hammer concepts to solve hydraulic engineering problems.	L3
CO3	**Evaluate** the hydraulic behaviour of open channels, including uniform flow, critical flow, and hydraulic jump.	L4
CO4	**Analyse** the performance and operating characteristics of hydraulic turbines using velocity triangles, efficiencies, and specific speed.	L3
CO5	**Evaluate** the working and performance characteristics of centrifugal pumps by determining head, efficiency, and operating parameters.	L4

Course Content

UNIT I

Flow through Pipes: Reynolds experiment and its significance, Reynolds number-laminar and turbulent flow, Velocity and shear distribution in laminar flow through circular pipes-Hagen Poiseuille equation.

Hydraulic gradient and total energy line, Major loss through pipes–Darcy Weisbach equation,

Minor Energy Losses- due to sudden enlargement and sudden contraction

UNIT II

Dimensional Analysis: Introduction, dimensional homogeneity, method of dimensional analysis-Rayleigh's and Buckingham's π-theorem methods.

Model analysis: Similitude-types of similarities, dimensionless numbers, model laws-Reynold's model law and Froude model law.

Unsteady flow in pipes: Water hammer phenomenon, pressure rise due to gradual and sudden valve closure for rigid and elastic pipes.

	UNIT III **Introduction to Open Channel Flow** - Comparison between open channel flow and pipe flow, classification of open channels, classification of open channel flows, geometrical parameters of a channel, velocity and pressure distribution across channel section. **Uniform Flow** - Characteristics and development of uniform flow, Chezy's formula, Manning's formula. Most economical section of channel. Specific energy & critical flow computation. Hydraulic jump and its applications. **UNIT IV** **Turbines:** Classification of turbines. Velocity Triangles, Work done and efficiency of Pelton Wheel, Francis turbine and Kaplan turbine. Unit quantities and specific speed. Performance characteristics of turbines. **UNIT V** **Centrifugal Pumps:** Components and functioning of a centrifugal pump-manometric head and efficiency, work done by impeller, priming of pump and minimum starting speed, specific speed and performance of centrifugal pumps.
Text books and Reference books	**Textbooks:** 1. P. N. Modi and S. M. Seth, "*Hydraulic and Fluid Mechanics*", Standard Book House, Delhi, 2013. 2. R.K. Rajput, Fluid Mechanics and Hydraulic Machines, S. Chand and Company, 2017. 3. K. Subramanya, *"Flow in Open Channels*", Tata McGraw-Hill Education, 2009. **Reference Books:** 1. A. K. Jain, "Fluid Mechanics: Including Hydraulic Machines", Khanna Publisher, 12th edition, 2016. 2. R. L. Streeter, G. Z. Watters, and J. K. Vennerd, "Elementary Fluid Mechanics", John Wiley International Publications, 7th Edition, 1996. 3. VenTe Chow, "*Open-Channel Hydraulics",* McGraw-Hill, New York, 1959.

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

25PC224CE HYDROLOGY AND WATER MANAGEMENT

Course Category	Professional Core	**Credits**	3
Course Type	Theory	**Lecture – Tutorial –Practical**	3-0-0
Prerequisite	Engineering Mechanics, Strength of Materials	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Understand the fundamental concepts of hydrology, the hydrologic cycle, and their applications in water resources engineering.
2. Explain the hydrological processes involved in precipitation, infiltration, evaporation, evapotranspiration, and runoff.
3. Understand the principles of groundwater occurrence, aquifer characteristics, and groundwater flow assessment.
4. Understand irrigation planning, crop water requirements, irrigation efficiencies, and different irrigation methods.
5. Understand the components of diversion headworks and apply the principles of canal design using Kennedy's and Lacey's theories.

Course Outcomes

COs	Statements	Blooms Level
CO1	Explain the interaction among various processes of the hydrologic cycle.	L2
CO2	Analyze rainfall and hydrological data for water resources applications.	L4
CO3	Calculate the drawdown and yield of confined and unconfined aquifers.	L3
CO4	Estimate crop water requirements and irrigation requirements.	L3
CO5	Design lined and unlined canals using Kennedy's and Lacey's theories.	L6

Course Content

UNIT I

Hydrological cycle:

Introduction: Hydrologic cycle, water budgeting, scenario of water resources in India, hydrology applications in engineering.

Precipitation-Forms of precipitation, types of rainfall, Characteristics of precipitation in India, measurement of rainfall, types of rain gauges, rain gauge network design, mean rainfall over an area, estimation of missing precipitation data, presentation of rainfall data, probable maximum precipitation, rainfall data in India.

UNIT II

	Abstraction of precipitation: Infiltration, infiltration capacity, infiltration indices, factors affecting infiltration, evaporation, and evapotranspiration Runoff: runoff, factors affecting runoff, estimating runoff, flow-duration curve, flow-mass curve, hydrograph, components of hydrograph, base flow separation, effective rainfall, unit hydrograph, S- hydrograph and its uses. **UNIT III** **Groundwater Hydrology:** Ground Water-Forms of sub surface water, vertical distribution of sub surface water, geologic formations of aquifers, saturated formation, types of aquifers, aquifer properties, Darcy"s law, types of wells, steady radial flow into wells in confined and unconfined aquifer, yield of open wells, safe yield, constant level pumping test and recuperation test. **UNIT IV** **Irrigation water requirement** Irrigation-Definition, necessity of irrigation, types of irrigation methods, advantages and ill-effects of irrigation. Duty, delta and base period of crops, crop water requirements, irrigation efficiencies, soil-water relationship, depth of irrigation, frequency of irrigation, wilting point, Conjunctive use. **UNIT V** **Distribution systems** Distribution systems- Introduction to diversion head works and its components, Types of canals, alignment, balancing depth, design of canals, Kennedy's and Lacey's theory, canal losses, lining of canals.
Text books and Reference books	**Textbooks:** 1. K. Subramanya, Engineering Hydrology, 5th Edition, McGraw Hill Education (India), 2023. 2. H.M. Raghunath, Hydrology: Principles, Analysis and Design, 3rd Edition, New Age International Publishers, 2015. 3. A.M. Michael, Irrigation: Theory and Practice, 2nd Edition (Revised Reprint), Vikas Publishing House, 2008. **Reference Books:** 1. Linsley, R.K., Kohler, M.A., & Paulhus, J.L.H. (1982). Hydrology for Engineers (3rd Edition). McGraw-Hill. 2. Singh, V.P. (Ed.). (2017). *Handbook of Applied Hydrology* (2nd Edition). McGraw-Hill Education.

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

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25PC254CE CONCRETE TECHNOLOGY LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Practical	**Lecture – Tutorial –Practical**	0-0-2
Prerequisite	Building Materials and Construction Practices & Strength of Materials	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. To impart practical knowledge of the physical properties and testing of cement as per relevant IS codes.
2. To develop practical skills in evaluating the physical properties and suitability of fine and coarse aggregates for concrete production.
3. To develop practical skills in preparing concrete and evaluating its workability using standard laboratory methods.
4. To impart practical knowledge of evaluating the compressive strength of hardened concrete as per relevant IS standards.
5. To develop practical skills in evaluating the split tensile strength of concrete for structural applications.

Course Outcomes

COs	Statements	Blooms Level
CO1	Assess the physical properties of cement by conducting standard laboratory tests in accordance with relevant IS codes.	L3
CO2	Evaluate the physical properties of fine and coarse aggregates and recommend their suitability for concrete production as per relevant IS codes.	L4
CO3	Prepare concrete and evaluate its workability using standard laboratory test methods.	L3
CO4	Evaluate the compressive strength of hardened concrete and interpret the test results for quality assessment as per relevant IS standards.	L4
CO5	Evaluate the split tensile strength of concrete and recommend its suitability for structural applications.	L4

Course Content

CYCLE I

Tests on Cement

1. Specific gravity of cement
2. Normal Consistency of cement
3. Fineness of cement.
4. Initial setting time of cement.
5. Compressive strength of cement.

CYCLE II

Tests on Aggregate

1. Specific gravity of fine aggregate
2. Fineness modulus of Fine and Coarse aggregate
3. Bulking of sand
4. Bulk density of fine and coarse aggregates

CYCLE III

Tests on Fresh & Hardened Concrete

1. Workability of concrete by Slump test
2. Workability of concrete by compaction factor test

	3. Compressive strength of concrete 4. Split tensile strength of concrete
Text books and Reference books	**Reference Books** 1. A.R.Shanthakumar —*Concrete Technology*‖– Oxford Publishers (Second edition). 2. M.S.Shetty and A.K.Jain —*Concrete Technology*‖- S.Chand& Co, 2018. 3. M.L. Gambhir —*Concrete Manual*‖, Dhanpat Rai & Sons. 4. IS 10262: 2019 —*Concrete Mix Proportioning — Guidelines*‖ (Second Revision). 5. IS 456 (2000): —*Plain and Reinforced Concrete - Code of Practice*" . 6. IS 269:1989 – *Specification for Ordinary Portland Cement* . 7. IS 516:1959 *Method of test for Strength of Concrete.* 8. IS 2386(Part 1):1963 *Methods of test for Aggregates for Concrete*: Part 1 Particle Size and Shape. 9. IS 2386(Part 2):1963 *Methods of test for Aggregates for Concrete*: Part 2 Estimation of Deleterious Materials and Organic Impurities.

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CO 1	3	2	1	3	2	–	–	–	–	–	2	2	1
CO 2	3	3	2	3	2	–	–	–	–	–	2	3	2
CO 3	3	3	2	3	2	1	–	–	–	–	2	3	2
CO 4	3	3	3	3	2	1	–	–	–	–	2	3	3
CO 5	3	3	3	3	2	1	–	–	–	–	2	3	3

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25PC256CE – MATERIAL TESTING LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Laboratory	**Lecture - Tutorial - Practical**	0 - 0 - 2
Prerequisite	Strength of Materials	**Sessional Evaluation**	40
		Semester End Exam Evaluation	60
		Total Marks	100

Course Objectives	To understand the characteristics and behavior of various materials used in buildings and infrastructure.	
Course Outcomes	CO1	Determine the strength and elastic modulus of various materials used in buildings and infrastructure.
	CO2	Evaluate the impact strength of mild steel.
	CO3	Compute the rigidity modulus of mild steel.
	CO4	Evaluate the hardness property of steel, copper and brass.
	CO5	Evaluate the stiffness property of the spring.
	CO6	Determine the elastic modulus and flexural rigidity of various types of beam.

Course Content

LIST OF EXPERIMENTS

1. Uni- axial tension test on a specimen of ductile material.
2. Stress – Strain characteristics of a ductile material.
3. Brinell`s hardness test.
4. Compression test on brick.
5. Bending test on simply supported beam of Timber.
6. Izod impact test
7. Compression test on close coiled helical spring.
8. Torsion test on a specimen of ductile material.
9. Bending test on Cantilever beam of Aluminum.
10. Bending test on Simply supported beam of Steel.
11. Bending test on Fixed beam of Copper.
12. Charpy impact test.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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Approved in the BOS
held on 28 /07 /26

25PC257CE HYDRAULIC ENGINEERING LABORATORY

Course Category	Professional Core	**Credits**	1
Course Type	Practical	**Lecture – Tutorial –Practical**	0-0-2
Prerequisite	Hydraulic Engineering	**Sessional Evaluation**	40
		Semester End Exam. Evaluation	60
		Total Marks	100

Course Objectives

1. Practical applications of open channel.
2. Application of force concepts on jets and hydraulic machines.
3. Determination of characteristic curves of turbines and pumps.

Course Outcomes

COs	Statements	Blooms Level
CO1	1. Illustrate the flow phenomenon in open channels.	L3
CO2	2. Demonstrate working principles of hydraulic pumps and turbines	L2
CO3	3. Infer the specific energy diagram by tilting flume	L2
CO4	4. Determine minor losses in pipes.	L3

Course Content

LIST OF EXPERIMENTS

1. Study of Uniform flow in open channels-Smooth and Rough by determination of rugosity coefficients.
2. Determination of a vane coefficient
3. Study of characteristic curves of a Pelton Wheel
4. Study of characteristic curves of a Francis turbine
5. Study of flow Characteristics over a broad crested weir
6. Determination of basic characteristics of a hydraulic jump
7. Study of flow Characteristics of venture flume.
8. Study of Specific Energy diagram- Tilting flume
9. Study of main characteristic curves of a Centrifugal pump
10. Determination of Minor losses in pipe.

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Text books and Reference books	1. S. K. Som, and Biswas, G, 'Fluid Mechanics and Fluid Machines', Tata McGraw-Hill Publishing Co., New Delhi, 1998 2. Yuan, S. W., 'Foundation of Fluid Mechanics', Prentice-Hall India Pvt. Ltd., New Delhi, 1976 3. C.S.P. Ojha, R.Berndtsson, P.N. Chandramouli, 'Fluid Mechanics and Machinery', Oxford University Press, New Dethi, 2010 4. A.K.Mohanty, 'Fluid Mechnics', Prentice-Hall India Pvt. Ltd., New Delhi, 1994 5. 5. P.N. Modi, 'Hydraulics and Fluid Mechanics Including Hydraulics Machines', Standard Book House, New Delhi, 2013.

CO-PO Mapping: 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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

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25PW259CE COMMUNITY SERVICE PROJECT

Community Project Themes

Department of Civil Engineering

- Water Conservation
- Rainwater Harvesting
- Solid Waste Management
- Plastic Waste Management
- Road Safety
- Traffic Survey
- Village Infrastructure Survey
- Building Safety Assessment
- School Infrastructure Improvement
- Energy Audit
- Environmental Awareness
- Tree Plantation
- Lake Restoration
- Public Health Awareness
- Disaster Management
- Financial Literacy
- Digital Literacy
- Smart Village Initiatives
- Sustainable Construction Practices

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REGULATIONS FOR COMMUNITY SERVICE PROJECT (CSP)

(Applicable to all B.E./B.Tech. Programmes)

1. Introduction

The Community Service Project (CSP) is a mandatory experiential learning course designed to develop social responsibility, ethical values, leadership qualities, environmental consciousness, and professional competence among engineering students through active engagement with society. The course provides students with opportunities to identify real-life community problems and apply engineering knowledge for sustainable societal development.

2. Applicability

These regulations shall be applicable to all undergraduate B.E. students admitted under the Autonomous Regulations of the Institute.

3. Nature of the Course

- Course Category: Project Work (Experiential Learning)
- Credits: 3
- L–T–P: 0–0–6
- Evaluation: Satisfactory (S) / Unsatisfactory (U)
- Completion Requirement: Mandatory for the award of Degree

4. Registration

Every student shall register for the Community Service Project during the semester prescribed in the curriculum.

5. Duration

The Community Service Project shall normally be carried out over a minimum period of **6 weeks** during the semester, with a minimum engagement of **120 hours**.

6. Objectives

The project aims to:

a) Develop social responsibility and ethical values.

b) Understand community needs through direct interaction.

c) Apply engineering knowledge to solve local problems.

d) Promote environmental sustainability.

e) Develop teamwork, leadership and communication skills.

f) Enhance lifelong learning and civic responsibility.

7. Mode of Execution

The Community Service Project may be undertaken individually or in groups of **3–5 students**, under the supervision of a faculty mentor.

Projects may be carried out in collaboration with:

- Government Departments
- Gram Panchayats

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- Municipal Corporations
- Government Schools
- NGOs
- Hospitals
- Industries
- Rural Communities
- Urban Local Bodies
- Other approved organizations

8. Scope of Activities

Students may undertake activities related to:

- Water resource management
- Rainwater harvesting
- Solid waste management
- Plastic waste reduction
- Road safety
- Traffic studies
- Village infrastructure
- Building condition survey
- Energy conservation
- Environmental protection
- Digital literacy
- Health and hygiene awareness
- Financial literacy
- Disaster preparedness
- Sustainable Development Goals (SDGs)
- Any other activity approved by the faculty mentor.

9. Project Stages

The Community Service Project shall include:

- Community identification
- Need assessment
- Field survey
- Data collection
- Problem identification
- Engineering intervention
- Implementation (where feasible)
- Outcome assessment
- Documentation

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- Presentation

10. Attendance

Students shall maintain a minimum of **90% attendance** in the approved community activities.

Attendance shall be certified jointly by:

- Faculty Mentor
- Community Supervisor / Organization Representative

11. Student Deliverables

Every student shall submit:

- Activity Diary / Log Book
- Attendance Record
- Survey Questionnaire
- Field Data
- Photographic Evidence
- Community Participation Certificate
- Final Project Report
- Presentation (PPT)
- Reflection Report

12. Assessment

The Community Service Project shall be evaluated for a total of 100 marks, comprising 40 marks for Internal Evaluation and 60 marks for External Evaluation.

A. Internal Evaluation – 40 Marks

The Internal Evaluation shall be carried out continuously by the Faculty Mentor / Departmental CSP Committee based on the student's participation and progress throughout the project.

Component	Marks
Attendance & Participation	10
Community Interaction & Need Assessment	10
Survey, Data Collection & Field Work	10
Project Report & Documentation	10
Total	**40**

B. External Evaluation – 60 Marks

The External Evaluation shall be conducted by an **External Examiner / External Evaluation Committee** constituted by the Institute/Department. The evaluation shall be

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based on the completed project, field activities, documentation, presentation, viva-voce, and outcomes.

Component	Marks
Attendance & Participation	10
Community Interaction & Need Assessment	10
Survey, Data Collection & Field Work	10
Project Report & Documentation	10
Presentation, Viva & Outcome Assessment	20
Total	**60**

Total Evaluation:

Evaluation	Marks
Internal Evaluation	40
External Evaluation	60
Grand Total	**100**

13. Award of Grade

A student shall be declared Satisfactory (S) if he/she:

- Secures a minimum of 50% of the total 100 marks in the overall evaluation.
- Satisfies the prescribed minimum attendance requirement.
- Submits all prescribed documents and deliverables.
- Successfully completes the approved field activities.
- Satisfies the requirements prescribed by the Departmental CSP Committee.

A student who fails to satisfy any of the above requirements shall be awarded Unsatisfactory (U).

14. Repetition

Students awarded an **Unsatisfactory (U)** grade shall re-register and complete the Community Service Project in a subsequent semester.

15. Academic Integrity

Students shall maintain honesty and professional ethics throughout the project.

Submission of fabricated data, copied reports, plagiarism, or false certificates shall attract disciplinary action as per Institute regulations.

16. Faculty Mentor

The Faculty Mentor shall:

- Approve the project topic.

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- Guide students throughout the project.
- Monitor progress.
- Verify field activities.
- Evaluate reports.
- Recommend the final grade.

17. Departmental Committee

Each department shall constitute a Community Service Project Committee consisting of:

- Head of Department (Chairperson)
- CSP Coordinator
- Faculty Mentors
- One External Member (if required)

The Committee shall oversee project implementation and evaluation.

18. Completion Requirement

Successful completion of the Community Service Project is mandatory for the award of the B.E./ B.Tech Degree.

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SCHEME OF INSTRUCTION & EXAMINATION B.E Civil w.e.f 2025-26

B.E Civil Engineering Department

SEMESTER V (THIRD YEAR)

S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hours	
Theory Courses										
1	25PC311CE	Design of Reinforced Concrete Elements	3	1	-	4	40	60	3	4
2	25PC312CE	Geotechnical Engineering	3	1	-	4	40	60	3	4
3	25PC313CE	Transportation Engineering	3	-	-	3	40	60	3	3
4	25PC314CE	Construction Engineering & Management	3	-	-	3	40	60	3	3
5	**Professional Elective - I**		3	-	-	3	40	60	3	3
Practical/ Laboratory Courses										
6	25PC351CE	Design Thinking & Innovation Laboratory	-	-	2	2	40	60	3	1
7	25PC352CE	Geotechnical Engineering Laboratory	-	-	2	2	40	60	3	1
8	25PC353CE	Transportation Engineering Laboratory	-	-	2	2	40	60	3	1
Industrial / Site visit / Technical tour										
9	**For practical learning and exposure to construction practices									
		Total	**15**	**2**	**6**	**23**	**320**	**480**		**20**

Note: Industrial visit / Site for practical learning and exposure to industrial practices

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

*GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

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SCHEME OF INSTRUCTION & EXAMINATION B.E Civil w.e.f 2025-26

B.E Civil Engineering Department

SEMESTER VI (THIRD YEAR)											
S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hours	
Theory Courses										
1	25PC321CE	Design of Steel Structural Elements	3	1	-	4	40	60	3	4
2	25PC322CE	Earthquake Resistance Design of Structures	3	-	-	3	40	60	3	3
3	25PC323CE	Environmental Engineering	3	-	-	3	40	60	3	3
4	25PC324CE	Water Resource Engineering	3	-	-	3	40	60	3	3
5	**Professional Elective –II /MOOCs course**		3	-	-	3	40	60	3	3
6	**Open Elective -I**		3	-	-	3	40	60	3	3
Practical/ Laboratory Courses										
7	25PC354CE	Environmental Engineering Laboratory	-	-	2	2	40	60	3	1
8	25PC355CE	Computer Applications in Civil Engineering Laboratory	-	-	2	2	40	60	3	1
Skill Development Course										
9	25SD356EE	Drone Technologies (SDC)	-	-	2	2	50	-	-	1
Experiential Learning Course										
10	***Summer Internship		4 weeks during summer vacations							
		Total	**18**	**1**	**6**	**25**	**370**	**480**		**22**

***Evaluation will be done in the VII – Semester

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

*GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

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Dean (Academics) MJCET

(Mr. N. SANJAY)

PROFESSOR Head of the Department of Civil Engineering University College of Engineering (Autonomous) Osmania University, Hyderabad-500 007.

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SCHEME OF INSTRUCTION & EXAMINATION B.E Civil wef 2025-26

B.E Civil Engineering Department

SEMESTER VII (FOURTH YEAR)											
S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hours	
Theory Courses										
1	25PC411CE	Estimation Costing and Specifications	3	1	-	4	40	60	3	4
2	**Professional Elective – III / MOOCs course**		3	-	-	3	40	60	3	3
3	**Professional Elective – IV**		3	-	-	3	40	60	3	3
4	**Open Elective – II**		3	-	-	3	40	60	3	3
Practical/ Laboratory Courses										
5	25PC451CE	Estimation, Costing and Specifications Laboratory	-	-	2	2	40	60	3	1
6	25PC452CE	STAAD Laboratory	-	-	2	2	40	60	3	1
7	25PW453CE	***Summer Internship	-	-	-	-	50	-	-	1
Experiential Learning Course										
8	25PW454CE	Major Project Phase-I	-	-	12	12	40	60	3	6
		Total	**12**	**1**	**16**	**29**	**330**	**420**		**22**

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

***GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

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B.E Civil Engineering Department

SEMESTER VIII (FOURTH YEAR)											
S.No	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hours/Week	CIE	SEE	Duration in Hours	
Theory Courses										
Three Week Induction Program										
1	**Professional Elective – V**		3	-	-	3	40	60	3	3
2	**Open Elective –III**		3	-	-	3	40	60	3	3
Experiential Learning Course										
3	25PW455CE	Major Project Phase-II	-	-	20	20	50	100	3	10
		Total	**6**	**-**	**20**	**26**	**130**	**220**		**16**

BS: Basic Science ES: Engineering Science MC: Mandatory Course

L: Lecture T: Tutorial P: Practical D: Drawing

CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

*GRADE: Satisfactory / Unsatisfactory (Non – Credit Mandatory Course)

S.V.N. Reddy HEAD DEPT. OF CIVIL ENGINEERING MUFFAKHAM JAH COLLEGE OF ENGG. & TECH Road No: 3, Banjara Hills, Hyderabad-34.

M. SANJAY

PROFESSOR Department of Civil Engineering University College of Engineering (Autonomous) Osmania University, Hyderabad-500 007.

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Professional Elective – I

S.No	Course code	Course title	Domain
1	25PE311CE	Construction Equipment and Automation	Emerging Civil Engineering
2	25PE312CE	Cost Effective Housing Techniques	Building Construction and Planning
3	25PE313CE	Pre-Fabricated Structures	Structural Engineering
4	25PE314CE	Sustainable Construction Methods	Emerging Civil Engineering

Professional Elective – II

S.No	Course code	Course title	Domain
1	25PE321CE	Pre-stressed Concrete	Structural Engineering
2	25PE322CE	Highway Construction and Management	Transportation Engineering
3	25PE323CE	Building Information Modelling	Emerging / Interdisciplinary
4	25PE324CE	Ground Improvement Techniques	Geotechnical Engineering

Professional Elective – III

S.No	Course code	Course title	Domain
1	25PE411CE	Advanced Concrete Technology	Structural Engineering
2	25PE412CE	Traffic and Road Safety Engineering	Transportation Engineering
3	25PE413CE	Foundation Engineering	Geotechnical Engineering
4	25PE414CE	GIS & Remote Sensing	Geo-Informatics

Professional Elective – IV

S.No	Course code	Course title	Domain
1	25PE415CE	Finite Element Method	Structural Engineering
2	25PE416CE	Green Building Technologies	Emerging / Interdisciplinary
3	25PE417CE	Intelligent Transport Systems	Transportation Engineering
4	25PE418CE	Retrofitting and Rehabilitation of Structures	Structural Engineering

Professional Elective – V

S.No	Course code	Course title	Domain
1	25PE 421 CE	Composite Constructions	Structural Engineering
2	25PE 422 CE	Watershed Management	Sustainability
3	25PE 423 CE	Disaster Preparedness and Planning	Civil Engineering
4	25PE 424 CE	AI & ML in Civil Engineering	Emerging / Interdisciplinary

S.V.N. Reddy
Dean (Academics)
MJCET

PROFESSOR
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University College of Engineering
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Osmania University, Hyderabad-500 007.

(Mr. M. SANJAY)

LIST OF OPEN ELECTIVES - I

S.No	Department	Course code	Course title
1	CED	25OE321CE	Disaster Management
2	MED	25OE321ME	Robotics and Automation
3	ECE	25OE321EC	Principles of Embedded Systems
5	CSE	25OE321CS	Fundamentals of Operating Systems
6	AI	25OE321AI	Principles of Artificial Intelligence
7	DS	25OE321DS	Introduction to Data Science

LIST OF OPEN ELECTIVES - II

S.No	Department	Course code	Course title
1	CED	25OE411CE	Principles of Green Buildings
2	MED	25OE411ME	Innovation and Entrepreneurship
3	ECE	25OE411EC	Wireless Sensor Networks
5	CSE	25OE411CS	Software Project Management
6	AI	25OE411AI	Machine Learning Techniques
7	DS	25OE411DS	Data Analytics

LIST OF OPEN ELECTIVES - III

S.No	Department	Course code	Course title
1	CED	25OE421CE	Road Safety Engineering
2	MED	25OE421ME	Renewable Energy Sources
3	ECE	25OE421EC	Global Navigation System
5	CSE	25OE421CS	Fundamentals of Cloud Computing
6	AI	25OE421AI	Prompt Engineering
7	DS	25OE421DS	Data and Internet Security

S.V.N. Reddy
HEAD
DEPT. OF CIVIL ENGINEERING
MUFFAKHAM JAH COLLEGE OF ENGG. & TECH
Road No: 3, Banjara Hills, Hyderabad-34.

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(Autonomous)
Osmania University, Hyderabad-500 007.

(Mr. M. Sanjay)

Dean
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Credit Summary

Semester	I	II	III	IV	V	VI	VII	VIII	Total
Credits	20	18	20	22	20	22	22	16	160

COURSE TYPE DISTRIBUTION OF CREDITS

S.No.	Course Type	I	II	III	IV	V	VI	VII	VIII	TOTAL	Percentage
1	Humanities and Social Sciences (HS)	-	3	-	3	-	-	-	-	6	3.75
2	Basic Sciences(BS)	9	9	3	-	-	-	-	-	21	13.12
3	Engineering Sciences(ES)	11	5	-	-	-	-	-	-	16	10
4	Program Cores(PC)	-	-	16	15	17	16	6	-	70	43.75
5	Program Electives(PE)	-	-	-	-	3	3	6	3	15	9.37
6	Open Electives(OE)	-	-	-	-	-	3	3	3	9	5.62
7	Project / Seminar / Internship	-	-	-	3	-	-	7	10	20	12.50
8	Mandatory Courses (MC)	-	-	-	-	-	-	-	-	0	0
9	Skill Development Course	-	1	1	1	-	-	-	-	3	1.80
	TOTAL	20	18	20	22	20	22	22	16	160	100%

S.V.N. Reddy
HEAD
DEPT OF CIVIL ENGINEERING
MUFFAKHAM JAH COLLEGE OF ENG. & TECH
Road No: 3, Banjara Hills, Hyderabad-34.

N. Sanjay
(Mr. N. SANJAY)

PROFESSOR
Department of Civil Engineering
University College of Engineering
(Autonomous)
Osmania University, Hyderabad-500 007.

Dean
(Academics)
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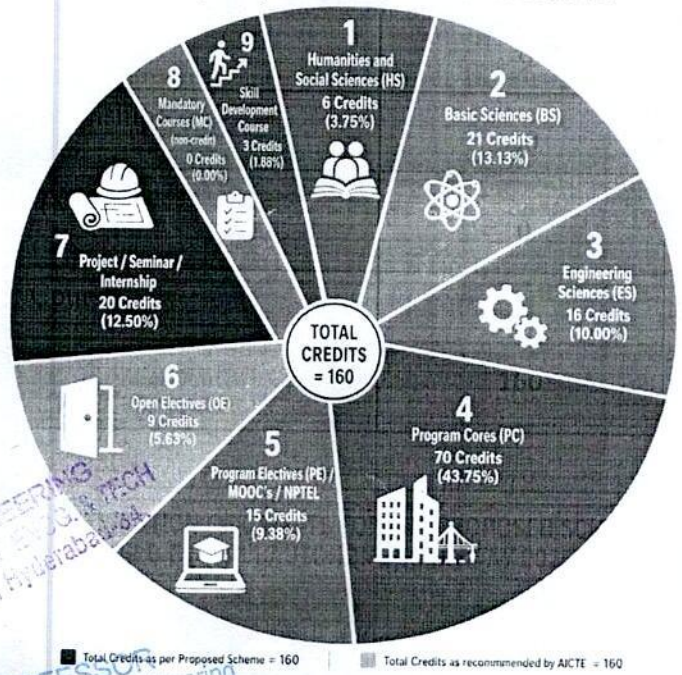
Distribution of credits for the Proposed Scheme for B.E (Civil) Autonomous w.e.f AY 2025-26			
S.No	**Course Type**	**No. of Credits as per the proposed Scheme**	**No. of Credits as recommended by AICTE**
1	Humanities and Social Sciences (HS)	**6**	6
2	Basic Sciences(BS)	**21**	24
3	Engineering Sciences(ES)	**16**	20
4	Program Cores(PC)	**70**	58
5	Program Electives(PE)/MOOC's/NPTEL	**15**	26
6	Open Electives(OE)	**9**	12
7	Project / Seminar / Internship	**20**	16
8	Mandatory Courses (MC)	**0**	(non-credit)
9	Skill Development Course	**3**	2
	Total	**160**	**160**

DISTRIBUTION OF CREDITS FOR THE PROPOSED SCHEME FOR B.E (CIVIL) AUTONOMOUS w.e.f AY 2025-26



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DEPARTMENT OF CIVIL ENGINEERING
MUFFAKHAM JAH COLLEGE OF ENG. & TECH
Road No. 3, Banjara Hills, Hyderabad-34

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(Academics)
MJCET

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Department of Civil Engineering
University College of Engineering
Osmania University, Hyderabad-500 007.