Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Introduction to Structural Engineering
Course Code	CEL0101[T]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	C
					3	-1	1	3
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Students must know about various elements and basics of materials			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will get knowledge of Basic Civil Engineering**(BL1-Remember)** **CO2-** To understand the Soil properties, Building elements, Integeration of Techniques**(BL2-Understand)** **CO3-** Students are able to apply knowledge of surveying in field**(BL3-Apply)** **CO4-** To Analyse the different Plannings of building**(BL4-Analyze)** **CO5-** To evaluate the behavior and Structural failure & constructional issues**(BL4-Analyze)** **CO6-** To Complete Determination of Layouts **(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction of soil, Preliminary definition and relationships, determination of index properties, classification of soils, soil structure and clay mineralogy, bearing capacity, shear strength, different types of foundations, shallow ,pile, well, machine foundation, site investigation and sub soil exploration, advanced measuring instruments	Experimental learning , case study ,field trips	8
2	Introduction of surveying, Principle of surveying, Reconnaissance, types of surveying, different types of map, Methods of linear measurements, Conventional symbols, Area calculation, Traversing and Triangulation	Experimental learning , case study ,field trips	8
3	Drawing of Building Elements, Drawing of various elements of buildings like different types of door, windows, lintels, arches, staircase, floors and roofs, Building Planning, Principles of Layout, Different types of IS codes and its provision, different types of loads	Experimental learning , case study ,field trips	9
4	Introduction, properties, grades, advantage & disadvantages of concrete, Ingredients of concrete, types of cement, aggregates, water, admixtures, Inspection & testing of materials as per Indian Standard Specifications, bricks, types of bond, destructive and non destructive testing of materials.	Experimental learning , case study ,field trips	9
5	Structural integrity, Physical and performance failure, fatigue failures, failure due to defective materials, failure due to manufacturing errors, failure due to natural disasters, Different types of new structural designing software	Experimental learning , case study ,field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Sieve Analysis of Fine Aggregates	Experiments	BL3-Apply	2
2	Sieve Analysis of Course Aggregates	Experiments	BL3-Apply	2
3	To range the chain line of 40 to 60m	Experiments	BL3-Apply	2
4	Reconnaissance Survey for Index Sketch	Experiments	BL3-Apply	2
5	Drawing of Bars in Beams	Experiments	BL2-Understand	2
6	Drawing of Bars in Columns	Experiments	BL2-Understand	2
7	Specific Surface of Aggregate	Experiments	BL3-Apply	2
8	Samplings of Soil	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	60	30	40	0

Part E

Books	Bhavikatti S.S, Basics Civil Engineering, New Age International Publishers
Articles	
References Books	Bansal R.K, Basic Civil Engineering and Engineering Mechanics, Laxmi Publication
MOOC Courses	https://nptel.ac.in/courses/105106201
Videos	https://www.youtube.com/watch?v=CsKddkqgwVk&list=PLyqSpQzTE6M_SM0Lrnzk2dJFwElh0Ebhu

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	2	2	1	-	-	-	2	2	-	3	2	2
CO2	2	2	1	-	-	2	-	-	-	1	-	2	2	2	2
CO3	2	1	3	1	2	-	-	-	-	2	-	-	-	2	-
CO4	1	2	2	3	-	1	-	-	1	1	1	2	3	2	-
CO5	2	1	1	-	2	-	1	-	-	2	-	-	1	2	1
CO6	1	1	-	1	1	-	-	-	-	2	2	-	2	-	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Basic Electronics
Course Code	ECL0101[T]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Knowledge of modern physics			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To become familiar with various types of semiconductors and basic electronic devices.**(BL1-Remember)** **CO2-** To understand the operation of various electronic devices.**(BL2-Understand)** **CO3-** To implement the concepts of semiconductors to various semiconductor devices. **(BL3-Apply)** **CO4-** To analyze the various electronic devices and their frequency response.**(BL4-Analyze)** **CO5-** To evaluate the performance of electronic devices such as diodes, transistors, function generators, and cathode ray oscilloscopes.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
I	Semiconductor Basics: Intrinsic and Extrinsic Semiconductors, Current Mechanisms in Semiconductors: Drift and Diffusion Current. PN Junction: Formation of PN Junction, Creation of Depletion Layer, Forward and Reverse Biasing, Diode Current Equation, Volt – Ampere characteristics of PN junction diode and effect of temperature on V-I characteristics, Diode resistances, Diode Capacitances, Diode Equivalent circuits: Piecewise Linear approximation Model, Simplified approximation Model, Ideal equivalent circuit.	Lecture Method/Video Clips	12
II	Diode Applications: Diode as Rectifier: Half Wave rectifier, Full Wave Rectifier, Calculation of Average, RMS loads voltages and currents, Rectification efficiency, PIV, Ripple factor. Break Down Diodes: Avalanche and Zener Breakdown. V-I characteristics of Zener Diode, Zener Diode Specifications, Zener Diode Equivalent Circuit. Zener Diode as Shunt Regulator: Analysis of Zener diode as shunt regulator under varying Load capacitance and Supply voltage.	Lecture Method/Video Clips/Simulation	10
III	Bipolar Junction Transistor: Formation of NPN and PNP Transistor, unbiased and biased transistor, Transistor currents, Symbol of NPN and PNP Transistors, Common Base, Common Emitter and Common Collector Configurations along with Input and Output Characteristics, Transistor Amplifying action. Transistor Biasing: Load Line, Operating Point, Need of Biasing, Different Biasing Techniques: Fixed Bias, Emitter Stabilized Bias, Voltage Divider Bias, DC Bias with Voltage Feedback	Lecture Method/Video Clips/Virtual Labs	10
IV	Field Effect Transistor: JFET: Construction of N channel and P channel JFET, Working of JFET along with Drain and Transfer Curves, JFET Parameters and symbol, JFET Biasing. MOSFET: Construction and working of N channel and P channel Depletion and Enhancement MOSFETs, Drain and Transfer curves, Symbols. Operational Amplifier: Basics of operation amplifier, op-amp parameters: Input offset voltage, Output offset voltage, Slew rate, CMRR etc. Open and closed loop gain, Virtual Ground, Characteristic of ideal operational amplifier. Operational Amplifier Applications: Use of Ideal Op-amp to construct: Inverting amplifier, Non-inverting amplifier,	Lecture Method/Video Clips/Virtual Labs	12

	Differentiator, Integrator, Adder, Subtractor etc.		
V	Electronic Instruments: Digital Voltmeter, Digital Multimeter, Cathode Ray Oscilloscope, Applications of CRO: Measurement of Voltage, Current, Time Period, Frequency, Use of Lissajous Pattern to Measure unknown frequency and phase difference, Function Generator.	Lecture Method/Video Clips/Virtual Labs/Simulation	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Ho
1	Introduction to Laboratory Equipment's: Cathode Ray Oscilloscope (CRO), Function Generator, Digital Multimeter.	Experiments	BL2-Understand	2
3	To study Full Wave Centre Tap Rectifier and calculate various parameters.	Experiments	BL4-Analyze	2
1	To study and plot the V-I characteristics of PN Junction Diode.	Experiments	BL4-Analyze	2
4	To study Full Wave Bridge Rectifier and calculate various parameters	Experiments	BL4-Analyze	2
3	To study and plot Input & Output Characteristics of BJT in Common Base Configuration	Experiments	BL5-Evaluate	2
4	To study and plot Input & Output Characteristics of BJT in Common Emitter Configuration	Experiments	BL4-Analyze	2
2	To Design Half-Wave rectifier by using basic electronic components	PBL	BL6-Create	10
4	To Design subtractor using OPAM	PBL	BL6-Create	10

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	0

Part E

Books	Boylestad & Nashelsky Electronics Devices and Circuit Theory Pearson Education India, 2009. Ramakant A. Gayakwad Op Amps and Linear Integrated Circuits Englewood Cliffs: Prentice-Hall, 2012.
Articles	Popović, Božidar, et al. "Remote control of laboratory equipment for basic electronics courses: A LabVIEW-based implementation." Computer Applications in Engineering Education 21.S1 (2013): E110-E120.
References Books	Malvino, L. Electronic principles The McGraw Hill Companies, 2016. Sedra and Smith, Microelectronics circuits, Fifth edition by Oxford University Press 2017 Graham Bell Electronic Devices and Circuits Prentice-Hall 2009
MOOC Courses	https://nptel.ac.in/courses/122106025
Videos	https://nptel.ac.in/courses/122106025

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	2	-	-	-	3	-	-	-	-	1
CO2	3	2	1	-	-	2	-	-	-	3	-	-	2	2	2
CO3	1	1	1	3	-	-	-	-	-	-	-	-	2	3	2
CO4	1	1	1	3	2	-	-	-	-	-	-	-	3	3	2
CO5	1	1	-	2	-	-	-	-	-	-	-	-	2	3	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Communication Skills & Colloquim
Course Code	HUL0101[T]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	
					3	0	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	The course is designed to enable students to enhance ability to comprehend of spoken and written English (and use English) required for effective communication in their professional work			**Co-Requisite/s**	Communication skills and emotional intelligence etc.			
Course Outcomes & Bloom's Level	**CO1-** Determine interpersonal skills and be an effective goal-oriented team player. **(BL1-Remember)** **CO2-** Classify and formulate the elementary intricacies of Scientific and Technical Writing using applicative grammar construct. **(BL2-Understand)** **CO3-** Create cohesive technical paragraphs & text. **(BL3-Apply)** **CO4-** Analyzing: Students will be able to analyze information learnt about communication to become a good communicator.**(BL4-Analyze)** **CO5-** Evaluating: Students will be able to Compare the usage between reading and writing skills and evaluate the importance of both the skills to make process of communication successful.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✓ Gender ✕ Human Values ✓ Environment ✕		**SDG (Goals)**	SDG1(No poverty) SDG10(Reduced inequalities)				

Part B

Modules	Contents	Pedagogy	Hours
Module 1	Introduction to Communication Skills, Objectives, Significance of Communication, Flow of Communication, Principles Communication, Essential Features, Process of Communication, Verbal (Oral & Written) and Non-verbal Communication, Barriers to Effective Communication, Introduction to Technical Communication, Major Difference between Technical Communication and General Communication.	Classroom Lecture, PPts,	6
Module 2	Introduction to Communication Skills, Objectives, Significance of Communication, Flow of Communication, Principles Communication, Essential Features, Process of Communication, Verbal (Oral & Written) and Non-verbal Communication, Barriers to Effective Communication, Introduction to Technical Communication, Major Difference between Technical Communication and General Communication.	Classroom Lecture, PPts,	6
Module 3	Introduction to Formal Letter Writing, Elements of Letter Writing and Style of Writing, Layout & Structure of Formal Letter Writing, Introduction to the Types of Business Letters- Enquiry, Calling Quotations, Order,Complaint and Adiustment.Introduction to Employment Communication- Job Application, Writing Resume, Differences among Resume, Curriculum Vitae & Bio-data.	Classroom Lecture, PPts, Videoes	6
Module 4	Introduction to Oral Presentations, Objectives, Significance and Approach, Preparation and Delivery of Oral Presentation (topics to be selected by the teachers). Introduction to Interview Skills. How to Develop Interview Skills. Dos and Don't of Interviews, Types of Interviews, Reviewing TV Program/Book/News Paper Articles etc.	Classroom Lecture, PPts, Videos	6
Module 5	Introduction to Report Writing, Major Objectives of Writing Reports, Significance of Business/Technical, Types and Forms of Reports, Styles of Writing Reports- Printed Format, Memo Format, Letter Format, Book/Letter Text Format. Layout and Structure of Reports, Components of Reports, Writing.	Classroom Lecture, PPts, Videos	6

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	28
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	30

Part E

Books	A Text Book of Scientific and Technical Writing by S.D. Sharma; Vikas Publication, Delhi
Articles	www.helpguide.org/articles/relationships-communication/effective-communication.htm
References Books	Rizvi, M.A. Academic Writing: A course in English for Science and Technology, Nabodaya Prakashak , Calcutta
MOOC Courses	https://nptel.ac.in/courses/109103020
Videos	https://nptel.ac.in/courses/109103020

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	2	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	1	1	-	1	-	-	-	-	2	-	-	3	2	3
CO4	3	2	-	2	1	-	-	-	-	2	-	-	2	3	3
CO5	3	2	-	2	1	-	-	-	-	2	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Calculus For Engineers
Course Code	MAL0101[T]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	C
					5	3	2	10
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basic knowledge of Functions, Limit, Continuity and Differentiability			**Co-Requisite/s**	Basic knowledge of variables			
Course Outcomes & Bloom's Level	**CO1-** Knowledge about the derivative and use of derivative to expand the functions and evaluation of Maxima and Minima.**(BL1-Remember)** **CO2-** Knowledge about the vector valued function directional derivative, gradient, divergence and curl with their properties**(BL2-Understand)** **CO3-** Applying: Partial derivatives and its applications apply to evaluate the Maxima and Minima.**(BL3-Apply)** **CO4-** Find the area under a given curve, length of an arc through integration as application to Beta and Gamma Function.**(BL4-Analyze)** **CO5-** Evaluating: Find the area and volume by applying the techniques of double and triple integrals., **(BL5-Evaluate)** **CO6-** Applications of vector valued function in integration to find line , surface and volume. **(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
Unit 1	Differentiation, Extremaon an Interval, Rolle's Theorem and the Mean Value Theorem, Increasing and Decreasing functions and First derivative test, Second derivative test, Maxima and Minima. Functions of two variables, partial derivatives, total differential, Jacobian and it Prosperities	Audio/Video clips, group discussion, lecture with PPTs, quiz	8
Unit 2	Taylor's expansion for two variables, maxima and minima, constrained maxima and minima, Lagrange's multiplier method. Integration, Average function value, Area between curves, Volumes of solids of revolution, Beta and Gamma functions, interrelation.	Audio/Video clips, group discussion, lecture with PPTs, Quiz	8
Unit 3	Evaluation of double integrals, change of order of integration, change of variables between Cartesian and polar co-ordinates, Evaluation of triple integrals, change of variables between Cartesian and cylindrical and spherical co-ordinates, evaluation of multiple integrals using gamma and beta functions.	Audio/Video clips, group discussion, lecture with PPTs, Quiz	8
Unit 4	Scalar and vector valued functions, gradient, tangent plane, directional derivative, divergence and curl, scalar and vector potentials, Statement of vector identities, Simple problems.	Audio/Video clips, group discussion, lecture with PPTs, Quiz	8
Unit 5	Line, surface and volume integrals, Statement of Green's, Stoke's and Gauss divergence Theorems, verification and evaluation of vector integrals using them.	Audio/Video clips, group discussion, lecture with PPTs, Quiz	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Introduction to MATLAB through matrices, and general Syntaxes.	Experiments	BL3-Apply	2
2	Plotting and visualizing curves and surfaces in MATLAB– Symbolic computations using MATLAB	Experiments	BL3-Apply	2
3	Evaluating Extremum of a single variable function	Experiments	BL3-Apply	2
4	Understanding integration as Area under the curve	Experiments	BL3-Apply	2
5	Evaluation of Volume by Integrals (Solids of Revolution)	Experiments	BL3-Apply	2
6	Evaluating Maxima and minima of functions of several variables	Experiments	BL3-Apply	2
7	Evaluating triple integrals	Experiments	BL3-Apply	2
8	Evaluating gradient, curl and divergence	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	12	60	28
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	0	40	20	60	30

Part E

Books	1. Thomas' Calculus by George B. Thomas, D. Weirand J. Hass, 13th edition 2014, Pearson. 2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers. 3. B.V. Ramana, Higher Engineering Mathematics, Tata Mc Graw Hill.
Articles	
References Books	1. E. Kreyszig, Advanced Engineering Mathematics, 8th Ed., John Wiley and Sons, 1999. 2. Gorakhprasad, Integral Calculus, Pothishala Publication. 3. Gorakhprasad, Differential Calculus, Pothishala Publication.
MOOC Courses	https://onlinecourses.nptel.ac.in/noc24_ee09/preview
Videos	https://onlinecourses.nptel.ac.in/noc24_ph02/preview

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	2	2	-	-	-	-	-	-	-	-	2	3
CO2	2	3	1	2	2	-	-	-	-	-	-	-	-	2	3
CO3	2	2	1	1	1	-	-	-	-	-	-	-	-	1	3
CO4	1	2	-	-	-	-	-	-	-	-	-	-	-	1	2
CO5	-	2	-	-	-	-	-	-	-	-	-	-	-	1	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Engineering Mechanics
Course Code	MEL0101[T]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	C
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Knowledge of basic sciences			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** CO1 Remember the basics of sciences in effects of system of forces on rigid bodies in static and kinetic conditions**(BL1-Remember)** **CO2-** CO2 Understand the basics of sciences in effects of system of forces on rigid bodies in static and kinetic conditions.**(BL2-Understand)** **CO3-** CO3 Apply system of forces in the belts drive systems as power transmission devices, shafts and beams.**(BL3-Apply)** **CO4-** CO4 Analyze the beams and trusses with centre of mass and moment of inertia.**(BL4-Analyze)** **CO5-** CO5 Evaluate shear force and bending moment in designing of shafts and beams and trusses.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure)				

Part B

Modules	Contents	Pedagogy	Hours
Unit-1	Introduction of Engineering Mechanics Basic concepts of system of forces- Coplanar Concurrent Forces - Components in Space – Resultant Moment of Forces and its Application - Couples and Resultant of Force System - Equilibrium of System of Forces- Free body diagrams- Equations of Equilibrium of Coplanar Systems and Spatial Systems.	Lectures with whiteboard/PPT, Quiz, Group discussion	9
Unit-2	Friction Types of friction, Limiting friction, Laws of Friction, static and Dynamic Friction. Motion of Bodies - Wedge, Ladder and Screw jack.	Lectures with whiteboard/PPT, Quiz, Group discussion	7
Unit-3	Transmission of Power Belt Drivers - Open, Crossed and compound belt drives, length of belt, tensions- tight side and slack side, Power transmitted and condition for maximum power.	Lectures with whiteboard/PPT, Quiz, Group discussion	7
Unit-4	Center of Gravity & Moment of Inertia: Centroids - Centroids of Composite figures - Centre of Gravity of Bodies - Area moment of Inertia: - polar Moment of Inertia - Transfer - Theorems - Moments of Inertia of Composite Figures, Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia..	Lectures with whiteboard/PPT, Quiz, Group discussion	8
Unit-5	Shear Force & Bending Moment Diagrams & Trusses: Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple. Application of Equilibrium Concepts. Trusses- types, method of joints and method of moments.	Lectures with whiteboard/PPT, Quiz, Group discussion	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Experiment-1	1. To verify the law of Triangle of forces and Lami's theorem.	Experiments	BL3-Apply	2
Experiment-2	2. To verify the law of parallelogram of forces	Experiments	BL3-Apply	2
Experiment-3	3. To verify law of polygon of forces	Experiments	BL3-Apply	2
Experiment-4	4. To find the support reactions of a given truss and verify analytically.	Experiments	BL3-Apply	2
Experiment-5	5. To determine support reaction and shear force at a given section of a simply supported beam and verify in analytically using parallel beam apparatus.	Experiments	BL3-Apply	2
Experiment-6	6. To verify bending moment at a given section of a simply supported beam.	Experiments	BL3-Apply	2
Experiment-7	7. To find coefficient of friction on horizontal and inclined planes.	Experiments	BL3-Apply	2
Experiment-8	8. To determine centre of gravity of different shapes.	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	Engineering Mechanics by Dr. D.S. Kumar, S.K. Kataria & sons, latest edition. Engineering Mechanics by R. K. Rajput, S.Chand & Co. Engineering Mechanics: Statics & Dynamics by R.C. Hibbler
Articles	
References Books	• Engineering Mechanics- statics dynamics by Boresi & Schmidt, Thomson Books • Engineering Mechanics - Schaum's series - Mc.Grawhill Publications. • Engineering Mechanics by S. Timashenko, D.H. Young and J.V. Rao
MOOC Courses	https://archive.nptel.ac.in/courses/112/106/112106286/
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	1	-	-	1	1	1	1	1	1
CO2	3	3	1	1	-	1	3	-	1	1	1	2	1	1	1
CO3	3	3	3	2	2	2	1	2	1	-	1	2	1	1	1
CO4	3	3	2	3	2	2	1	-	1	1	2	2	2	2	2
CO5	3	3	3	3	2	2	2	2	2	3	3	3	3	3	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Mechanical Workshop Practice
Course Code	MEP0101[P]

Part A

Year	1st	**Semester**	1st	**Credits**	L	T	P	C
					0	0	2	2
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s	Basic knowledge of casting, joining and machining.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember basics of physics.**(BL1-Remember)** **CO2-** To understand the tool materials and their proper applications.**(BL2-Understand)** **CO3-** To prepare and manufacture the various joints using carpentry and fitting shop tools and welding process.**(BL3-Apply)** **CO4-** To analyze casting and welding products.**(BL4-Analyze)** **CO5-** To evaluate the casting process parameters and welding parameters for efficient productivity.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure)				

Part B

Modules	Contents	Pedagogy	Hours
Unit-1	Carpentry Shop Carpentry, process of finished products, building work, furniture, cabinet making Etc. joinery, preparation of joints, Timber, Timber sizes, classification of Timber, Characteristics of good timber, seasoning of wood.	Lectures with whiteboard/PPT, Recorded video/interactive videos, Quiz	
Unit-2	Marking and Measuring Tools Steel rule and Steel tape, Marking gauge, Try-square, Compass and divider, Scriber or marking knife, Bevel, Holding Tools- Carpenter's vice, C-clamp , Bar cramp, Planning Tools- Jack plane, Smoothing plane, Rebate plane, Plough plane Cutting Tools- Saws, Cross-cut or hand saw, Rip saw, Tenon saw, Compass saw, Chisels, Drilling and boring tools- Carpenter's brace, Auger bit, Hand drill, Gimlet, miscellaneous tools- Mallet, Pincer, Claw hammer, Screw driver, Wood rasp file, Bradawl, wood joints- Lap joints, Mortise and Tenon Joints, Bridle joint.	Lectures with whiteboard/PPT, Recorded video/interactive videos, Quiz	
Unit-3	Welding Shop Electric arc welding, Gas welding, Thermal welding, Electrical Resistance welding, Friction welding Equipment Used for Welding- Transformers, Motor generators, Rectifiers, Welding cables, Electrodes, electrode holder, Ground clamp, wire brush and chipping hammer, Welding table and cabin, Face shield, Hand gloves. Techniques of welding Preparation of work, striking an arc, Strike and Withdraw, Touch and with draw, Weaving, Types of Joints- Butt Joint, Corner Joint, Tee Joint, Lap joint, Edge welding positions- Flat position welding, Horizontal position welding, Vertical position welding, Overhead position welding.	Lectures with whiteboard/PPT, Recorded video/interactive videos, Quiz	
Unit-4	Fitting Shop Introduction hand fitting,the assembly of machine tools, jigs, gauges, etc., bench work. assembly of mating parts, removal of metal, fit, simple hand tools. filing, chipping, scraping, sawing drilling, and tapping. Holding tools, Cutting Tools - Finishing Tools, Reamers, Files, miscellaneous tools ---- File card, Spirit level, Ball Peen Hammer, Cross Peen, Hammer, Straight-Peen Hammer, Screw driver, Spanners.	Lectures with whiteboard/PPT, Recorded video/interactive videos, Quiz	
Unit-5	Foundry shop Process, Melting, Furnace, Degassing, Mold making, Pouring, Shakeout, Degating, Heat treating, Surface cleaning, Finishing,	Lectures with whiteboard/PPT, Recorded video/interactive videos, Quiz	

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Experiment-1	To study of Tools and Their Operations in Carpentry joint	Experiments	BL2-Understand	4
Experiment-2	To Prepare Half Lap corner joint and T- joint	Experiments	BL3-Apply	4
Experiment-3	To study of tools and their operations in Fitting Shop	Experiments	BL3-Apply	4
Experiment-4	To study of tool and operations in welding shop	Experiments	BL3-Apply	4
Experiment-5	To study of single point cutting tools , machine tool and operations in machine shop	Experiments	BL3-Apply	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0	0			
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	1. S. K. Hazra Chowdhry Elements of Workshop Technology Vol-1 Tata Mc Graw Hill Publication 2 John K.C Mechanical Workshop Practice Paperback – 1 Khanna Publishers, 2001
Articles	
References Books	1. English, Paperback, Dave A K, Dubey D Workshop Technology & Practice Standard Publishers, 2010 2. W.A.J. Chapman Workshop Technology by vol. 1,2 Mc Graw Hill, 2001
MOOC Courses	https://archive.nptel.ac.in/courses/112/103/112103108/
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	-	2	2	1	-	-	2	2	2	1	-	-
CO2	1	2	2	2	2	1	2	2	-	-	-	2	2	3	3
CO3	2	1	2	-	-	-	2	2	-	-	-	2	3	-	3
CO4	1	2	2	-	-	2	1	-	-	2	2	3	3	2	2
CO5	-	2	1	2	2	2	3	2	-	-	-	2	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Structural Materials
Course Code	CEL0233[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	C
					2	1	2	5
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basics of Civil Engineering			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will get knowledge of Basic Structural Materials**(BL1-Remember)** **CO2-** To understand the materials use in Civil Engineering industry**(BL2-Understand)** **CO3-** Students are able to apply the details of Innovative Textures**(BL3-Apply)** **CO4-** To analyse different Admixtures & other adhesives**(BL4-Analyze)** **CO5-** To evaluate the behavior of different Structural materials in different purposes**(BL5-Evaluate)** **CO6-** To Create adequate type of Construction material **(BL6-Create)**							
Coures Elements	Skill Development ✕ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Compressive Strength of Bricks	Experiments	BL2-Understand	2
2	Water absorption of Bricks	Experiments	BL2-Understand	2
3	Initial and Final Setting time of Cement	Experiments	BL3-Apply	2
4	Efflorescence of Bricks	Experiments	BL2-Understand	2
5	Specific Gravity of Aggregate	Experiments	BL3-Apply	2
6	Fineness of Cement	Experiments	BL2-Understand	2
7	Tensile test of TOR Steel	Experiments	BL3-Apply	2
8	Soundness of Cement	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Rangwala, Engineering Materials, Charotar Publication
Articles	
References Books	S. K, Duggal, Building Materials, New Age Publication
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	1	1	-	2	-	2	2	3	2	2
CO2	3	3	2	2	2	-	1	-	-	-	2	2	3	3	3
CO3	2	2	2	3	1	1	-	-	2	-	-	2	2	2	1
CO4	3	2	3	2	2	-	1	-	-	-	2	1	1	2	2
CO5	2	2	2	3	1	1	-	-	2	1	2	3	1	3	3
CO6	3	2	3	2	2	1	1	-	2	1	3	2	1	1	2

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Essentials of Information Technology
Course Code	CSL0201[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	
					2	0	2	4
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	To understand the contents and successfully complete this course, a participant must have a basic understanding of Basics of Computer system, Storage Systems, Operating systems, Networking and Database.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the basics of Computer systems like types, I/O devices, storage of computer systems (Knowledge, Understand)**(BL1-Remember)** **CO2-** Apply the various networking concepts, topologies and remove deadlocks. (Apply). **(BL2-Understand)** **CO3-** Explain various memory management techniques and Analyze the concept of Sub-programs and blocks (Analysis)**(BL3-Apply)** **CO4-** Design the concept of software, operating system for better utilization of external system (Design)**(BL4-Analyze)** **CO5-** Evaluating the various algorithm, its solution and other communication techniques. (Investigation).**(BL5-Evaluate)**							
Coures Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG4(Quality education) SDG8(Decent work and economic growth) SDG9(Industry Innovation and Infrastructure)				

Part B

Modules	Contents	Pedagogy	Hours
1	Computer Basics: Basics of Computer Systems(T1,T2), Evolution of Computers, Computer Generations, Classification of Computers(T1,T3), Computer Applications, Interaction between User and Computer(T7). Hardware Components, Basic Computer Organization, Input and Output Devices(T1,T3), Central Processing Unit(T1), System Bus Architecture, Memory or Storage Unit	White Board, PPT	6
2	Operating System: Introduction to Operating System, Function of Operating Systems(T1), Working Knowledge of GUI-Based Operating System (T3,T4), Working with latest version of Windows(T3,T4). Various Operating Systems, Evaluation of Operating System(T3,T4,T,7), Virtual Machine, Operating Systems for Mobile, Installation of Operating System(T1,T3,T4), Boot Process.	White Board, PPT	6
3	Computer Networks and World Wide Web: Introduction to Computer Networks (LAN, MAN, WAN, PAN)(T3,T4), Network Topologies, Ethical Issues related to Network Security(T2,T3). Internet and World Wide Web(T7,T8), Internet Evolution(T1), FTP, Electronic Mail, Search Engines(T1), Introduction to HTML, Static and Dynamic Web Pages	White Board, PPT	6
4	Computer Software: Introduction, System Software(T1,T3), Application Software, Firmware(T3), Software Installing and Uninstalling(T3,T4), Software Development Steps, Characteristics of good software(T1,T7), Usability of software, Introduction to Free and Open Source Software(T3,T4), Introduction to Database Management System	White Board, PPT	6
5	Subprograms and Blocks: Problem Solving: Flow Charts(T3,T4), Tracing Flow Chart, Algorithms. Fundamentals of sub-programs(T1,T3,T4), Scope of life time of variables, static and dynamic scope(T7), design issues of subprograms and operations, parameter passing methods(T3,T4), overloaded sub-programs, generic sub-programs(T1,T3), design issues for functions user defined overloaded operators	White Board, PPT	6

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Explain the Installation process of Operating system and its Memory Management.	Experiments	BL2-Understand	10
2-3	Design of a Web Page which describe your Biodata.	PBL	BL3-Apply	10
4-5	Describe Software development life cycle (SDLC) with all components.	PBL	BL5-Evaluate	10

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	60	18	40	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	0	40	20	60	0

Part E

Books	P. K. Sinha, Priti Sinha; Computer Fundamentals; BPB Publication. V. Rajaraman; Fundamentals of Computers; Prentice Hall of India Publication. G. G. Wilkinson; Fundamentals of Information Technology; Wiley-Blackwell Publishing. Yashwant P. Kanetkar; Let Us C; BPB Publication.
Articles	
References Books	E. Balagurusamy; Programming in ANSI C; Tata McGraw-Hill Publishing. Ron Mansfield; Working in MS-Office; Tata McGraw Hill Publishing.
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	1	1	2
CO2	1	2	-	-	-	-	-	-	-	-	-	-	3	3	2
CO3	-	-	1	-	-	-	-	-	-	-	-	-	3	2	2
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Programming Logics
Course Code	CSP0201[P]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	
					0	0	4	4
Course Type	Lab only							
Course Category	Foundation core							
Pre-Requisite/s	Basic understanding of Windows/Linux operating system.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Remember: Recall the syntax and basic concepts of C programming. **(BL1-Remember)** **CO2-** Understand: Explain the meaning of C programming constructs and how they work together**(BL2-Understand)** **CO3-** Apply : Apply the various conditional and looping statement and functional programming.**(BL3-Apply)** **CO4-** Analyzing: Analyze and evaluate C programming code to identify errors and optimize performance.**(BL4-Analyze)** **CO5-** Evaluate : Evaluate the effectiveness of C programming solutions and propose improvements.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG8(Decent work and economic growth)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction: Character set, variables and identifiers, built-in data types, arithmetic operators and expressions, constants and literals, simple assignment statements, basic input/output statements, simple 'C' programs.	PPT, Computer	10
2	Conditional Statements and Loops: Decision making within a program, conditions, relational operators, logical connectives, if statement, if-else statement; Loops: while loop, do-while loop, for loop; nested loops, infinite loops; switch statement, structured programming. Array: One Dimensional Arrays - array manipulation, searching, insertion and deletion in an array; Two Dimensional Arrays - addition/multiplication of two matrices, transpose of a square matrix; string	PPT, Computer	10
3	Pointer: Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, arrays and pointers, pointer arrays, dynamic memory allocation. Functions: Standard library functions, prototype of a function, return type, function calling, block structure, passing arguments to a function - call by reference and call by value; recursive functions, arrays as function arguments.	PPT, Computer	10
4	Structure and Union: Structure variables, initialization, structure assignment, nested structure, structures and functions, structures and arrays - arrays of structure, structures containing arrays, unions. Dynamic Memory Management: Use of malloc, calloc, realloc and free keywords	PPT, Computer	10
5	File Management: Introduction, defining and opening a file, closing a file, input/output operations on files, error handling during i/o operations, random access to files, programs using files. Command Line Arguments: argv and argc arguments, programs using command line arguments. Preprocessor: Introduction, macro substitution, file inclusion, compiler control directives.	PPT, Computer	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Life Insurance Premium Calculator	Experiments	BL3-Apply	10
2-3	Program to compare best life insurance plan using an array.	PBL	BL4-Analyze	10
4-5	Write a C program to read name and marks of n number of students from user and store them in a file. If the file previously exits, add the information of n students.	PBL	BL5-Evaluate	20

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	40				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	0	60	18	40	0

Part E

Books	B. W. Kernighan, Dennis M. Ritchi; The C Programming Language; Prentice Hall.
Articles	
References Books	Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill E. Balagurusamy; Programming in ANSI C; Tata McGraw-Hill Publishing.
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	-	-	-	-	-	-	-	2	3	1
CO2	1	2	1	2	2	1	-	-	-	-	-	-	1	-	3
CO3	2	-	1	-	-	2	-	-	-	-	-	-	3	2	2
CO4	2	1	-	2	1	-	-	-	-	-	-	-	3	3	2
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Principles of Electrical Engineering
Course Code	EEL0201[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Predict the behavior of any electrical circuits, Formulate and solve complex DC circuits.**(BL1-Remember)** **CO2-** Predict the behavior of any electrical circuits, Formulate and solve complex single phase AC circuits.**(BL2-Understand)** **CO3-** Predict the behavior of any electrical circuits, Formulate and solve complex Three phase AC circuits.**(BL3-Apply)** **CO4-** Identify the type of electrical machine used for that particular application. Realize the requirement of transformers in transmission and distribution of electric power and other applications.**(BL4-Analyze)** **CO5-** Predict the behavior of various measuring instruments in electrical engineering**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	D.C. Circuit: - Combination of resistance in series & parallel, their solution ,Star –Delta combination, KCL and KVL. Voltage and current sources, dependent and independent sources, source conversion, DC circuit's analysis using mesh & nodal method, Superposition theorem.	white board, ppt	10
2	Single Phase Circuit:- Generation of Alternating Voltage & Currents, Their Equation, Definition, R.M.S and Average values, Vector representation of alternating quantities, Phasor relations between voltage & current in each of resistance, inductance and capacitance, A.C series circuit power & power factor , Resonance in series circuit.	white board, ppt	12
3	Electrical Measuring Instruments:- Introduction and classification of Electrical Instruments, Essentials of indicating instruments, Moving iron instruments, Types ofmoving iron instruments, Advantages and Disadvantages of moving iron instruments, Applications of moving iron equipment, Permanente Magnet type moving coil instruments, extension of range of ammeters and voltmeter, Dynamometer type instruments, Dynamometer type wattmeters	white board, ppt	7
4	Poly-phase Circuits:-Generation of Poly-phase Voltages, 3phase system, Phase sequence, Inter connection of 3 phases, Voltage, Currents & Power relationships in balanced 3 phase circuits, Power Measurement in single phase & 3 phase circuits..	white board, ppt	8
5	Transformer:- Construction & working principle of transformer, Emf equation, No load & Full load phasor diagram , Equivalent circuit, Losses & Efficiency, Voltage Regulation, Open circuit & Short Circuit Test on the Transformer	white board, ppt	10

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	28
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
Articles	
References Books	1. Basic Electrical Engg, Sunil S Gaikwad, Dream Tech/ Willey Publication.
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1	1	-	-	-	-	-	-	-	1	1	2
CO2	1	1	2	1	1	3	-	1	-	-	1	-	2	3	1
CO3	2	1	2	1	2	-	2	-	2	2	-	-	1	2	2
CO4	1	3	1	2	3	-	-	-	-	-	-	-	3	1	3
CO5	1	1	1	2	1	-	-	-	-	-	-	-	2	2	1
CO6	1	1	1	1	1	-	-	-	-	-	-	3	1	3	2

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Statistics For Engineers
Course Code	MAL0203[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	C
					2	1	2	5
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	statistics for engineers typically include basic mathematics (algebra, calculus), understanding of probability theory, and familiarity with concepts in engineering disciplines. Additionally, knowledge of software tools like MATLAB or Python for data analysis is beneficial.			**Co-Requisite/s**	statistics for engineers may include introductory courses in engineering mechanics, computer programming, and experimental methods. Additionally, concurrent enrollment in courses covering linear algebra and differential equations could provide valuable mathematical background for understanding advanced statistical concepts and applications in engineering contexts.			
Course Outcomes & Bloom's Level	**CO1-** To remember basic concept of about the design data collection plans and basic tools of descriptive statistics.**(BL1-Remember)** **CO2-** To understand the identify relationship between two variables using scatter plot and Interpret a simple correlation. To understand the Knowledge about the different types of continuous distribution with their properties and applications.**(BL2-Understand)** **CO3-** To apply the test and make hypothesis by Student's t-test, F-test, chi-square test, Z test, goodness of fit.**(BL3-Apply)** **CO4-** To analyze the concept of sampling distribution of a statistic and its properties, difference between parameter and statistic.**(BL4-Analyze)** **CO5-** To evaluate and describe the properties of unbiasedness. Also identifying and provide an application the null hypothesis, alternative hypothesis and test statistic.**(BL5-Evaluate)**								
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG4(Quality education)				

Part B

Modules	Contents	Pedagogy	Hours
1	tInroduction to statistics and data analysis Measures of central tendency, Measures of variability, [Moments, Skewness, Kurtosis (Concepts only)]. Correlation and Regression, Partial and Multiple correlations, Multiple regressions.	Audio/Video clips, group discussion, lecture with ppt, quiz	10
2	Introduction, random variables, Probability mass Function, distribution and density functions, joint Probability distribution and joint density functions, Marginal, conditional distribution and density functions, Mathematical expectation, and its properties Covariance, moment generating function, characteristic function.	Audio/Video clips, group discussion, lecture with ppt, Review Analysis	10
3	Binomial and Poisson distributions, Normal distribution, Gamma distribution, Exponential distribution.	Audio/Video clips, group discussion, lecture with ppt, classroom presentations, Analysis	6
4	Testing of hypothesis, Introduction, Types of errors, critical region, procedure of testing hypothesis, Large sample tests, Z test for Single Proportion, Difference of Proportion, mean and difference of means.	Audio/Video clips, group discussion, lecture with ppt, quiz	8
5	Small sample tests, Student's t-test, F-test, chi-square test, goodness of fit, independence of attributes, Design of Experiments, Analysis of variance, one and two way classifications, CRD, RBD, LSD.	Audio/Video clips, group discussion, lecture with ppt, quiz	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Introduction: Understanding Data types; importing/exporting data.	Experiments	BL2-Understand	2
2	Computing Summary Statistics/plotting and visualizing data using Tabulation and Graphical Representations.	Experiments	BL3-Apply	2
3	Applying correlation and simple linear regression model to real dataset; Computing and interpreting the coefficient of determination	Experiments	BL3-Apply	2
4	Applying multiple linear regression model to real data set; computing and interpreting the multiple coefficient of determination	Experiments	BL3-Apply	2
5	Fitting the following probability distributions: Binomial distribution,	Experiments	BL3-Apply	2
6	Normal distribution Poisson distribution	Experiments	BL3-Apply	2
7	Testing of hypothesis for One sample mean and proportion from real, time problems	Experiments	BL3-Apply	2
8	Testing of hypothesis for Two sample mean and proportion from real, time problems	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	12	60	28
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	0	40	20	60	30

Part E

Books	M. Ray, H.S. Sharma, Sanjay Chaudhary Mathematical Statistics Ram Prasad & Sons J.N. Sharma, J.K. Goyal Mathematical Statistics Krishna Prakash and Media (P) Ltd
Articles	
References Books	E.Kreyszig Advanced Engineering Mathematics 8 th Ed., John Wiley and Sons, 1999 B.V. Ramana Higher Engineering Mathematics Tata McGraw Hill B. S. Grewal Higher Engineering Mathematics Khanna Publishers
MOOC Courses	https://onlinecourses.nptel.ac.in/noc24_ec03/preview
Videos	https://onlinecourses.nptel.ac.in/noc24_ec03/preview

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	2	-	-	-	2	2	-	1	-	-	-	-	1	-	1
CO2	3	3	1	3	3	2	-	1	-	1	-	-	2	-	2
CO3	3	2	-	1	3	-	-	-	-	-	-	-	1	3	2
CO4	3	2	-	2	-	-	-	-	-	-	-	-	-	3	1
CO5	2	2	-	1	-	-	-	-	-	-	-	-	-	2	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Environmental Pollution and Global Issues
Course Code	MCL0201[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	C
					2	1	0	3
Course Type	Theory only							
Course Category	Foundation core							
Pre-Requisite/s	Basic knowledge of natural resources, biodiversity, ecological succession, energy flow, environmental issues and problems.			**Co-Requisite/s**	A detailed understanding of the complexity of environment and its challenges and solutions to these problems and challenges.			
Course Outcomes & Bloom's Level	**CO1-** CO1. Develop environmental scientists and engineers and sensitize them towards environmental issues.**(BL2-Understand)** **CO2-** CO2. To acquire analytical skills in assessing environmental impacts through a multidisciplinary approach**(BL3-Apply)** **CO3-** CO3. Ability to distinguish between various methods of various pollution analysis**(BL4-Analyze)** **CO4-** CO4.Acquire expertise and skills needed for the Environmental Management Systems and techniques of monitoring, Environment audit, Environmental Impact Analysis, environment instrumentation and control systems and for the projects development, implementation, and maintenance.**(BL5-Evaluate)** **CO5-** CO5. Students acquire skills for to communicate, prepare, plan and implement the environmental management project**(BL6-Create)**							
Coures Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✓ Environment ✓		**SDG (Goals)**	SDG2(Zero hunger) SDG3(Good health and well-being) SDG5(Gender equality) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG10(Reduced inequalities) SDG11(Sustainable cities and economies) SDG12(Responsible consuption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land) SDG17(Partnerships for the goals)				

Part B

Modules	Contents	Pedagogy	Hours
Unit – 1 (Environment, Ecosystem and Environmental Education)	Environment – Definition and its segments, (Lithosphere, Hydrosphere, Atmosphere and Biosphere), Multidisciplinary nature of Environmental Science, Ecology and Ecosystem: Basic concepts, functions of ecosystem, Energy Flow, Food chain, food web, Ecological Pyramids, Ecological Successions. Environmental Education-Definition, scope, importance, Need for Public Awareness, Environmental Ethics. Environmental Impact Assessment: Screening, Scoping, Base line Analysis, Impact Mitigation, Documentation, Review, Public hearing, Post Project Monitoring.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, discussion (questions & answers section)	8
Unit – 2 (Natural Resources Management)	Natural Resources – Classification, Water Resources (availability, quality, water budget), Mineral Resources (distribution, availability and future perspectives), and Forest Resources. Energy Resources-Classification and alternatives of conventional energy resources- Solar, working of solar photovoltaic cells, Geothermal, Wind energy, Nuclear Energy, Biomass and Bio-gas	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion.	8
Unit – 3 (Water, Soil & Noise Pollution)	Water pollution – sources & effects, characteristics and treatment of waste water, engineered systems for water purification: Aeration, solid separation, settling operations, filtration and disinfection. Soil - formation of soil, elementary and mineral composition, types of soil in India, soil pollution, effects and abatements. Noise Hazards: Continuous and impulse noise, Effect of noise on man, Measurement and evaluation of Noise, noise isolation and absorption techniques, silencers, practical aspects of noise.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion.	8
Unit –4 (Atmospheric chemistry and Air Pollution)	Classification, sources and toxic effects of air pollutants, dispersal of air pollutants, engineered systems for air purification: Atmospheric cleansing process, approaches to contamination control. Air pollutants with emphasis on reactive intermediates in atmosphere like hydroxyl radical, ozone and nitrate radical, types of hydrocarbon in the troposphere, reaction of organic compounds in the atmosphere.(Green house gas effect, Global warming, Climate change).	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures,Audio/Video clips, Group discussion.	8

Unit – 5 (Waste Management)	Solid waste: Generation and waste characterization. Collection, storage and transport. Waste disposal, waste processing techniques, reduction, reuse and recycling, resource recovery and utilization. Physical and chemical treatment methods and composting. Hazardous waste management and treatment.	Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. Field visits. Industrial Visit (MSW/BMW/STP/ETP)	8

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Interna Evaluation**
100		60	30	40	20
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0				

Part E

Books	Environmental Science by B. S. Chauhan; Firewall Media, 2008 • Environmental Science by Cuningham and Cuningham; McGraw-Hill Education; 13th edition (16 February 2014) • Environmental Engineering by S. K. Dhameja; S. K. Kataria & Sons, 2009 • Environmental Science by Richard T Wright; Benjamin-Cummings Pub Co.
Articles	
References Books	Environmental Engineering by Howards S Peavy, Donald R Rowe, T. George • Environmental Science & Engineering by Gilbert M. Master • Environmental Chemistry by Stanley
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	1	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	1	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Making of Modern India
Course Code	MCL0202[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	
					3	0	0	3
Course Type	Theory only							
Course Category	Humanities, Social Sciences and Management							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** At the end of this course, students would be intellectually well equipped to have a sense of modern Indian history and culture. **(BL5-Evaluate)** **CO2-** The students will have an understanding of making of India as a nation**(BL2-Understand)** **CO3-** The students will have an understanding of salient features of modern India**(BL2-Understand)** **CO4-** It will help students to develop their personality and thinking horizon for being a good and concerned Indian Citizen **(BL3-Apply)**							
Coures Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✓ Gender ✓ Human Values ✓ Environment ✕		**SDG (Goals)**	SDG4(Quality education) SDG5(Gender equality) SDG15(Life on land)				

Part B

Modules	Contents	Pedagogy	Hours
1	1. Idea of India in historical perspective a) Indian culture, b) cultural commonness, c)cultural diversities, d)unity in diversity, e) culturall accomodations ,f) cultural conflicts, g)Idea of India and British Rule , h) Role of Indian Intelligentsia.	Lectures with Presentation and Case Studies	6
2	Emergence and growth of Indian Nationalism a) Anti-colonial basis ,b) Economic Nationalism ,c) communalism and nationalism ,d) revivalism and Indian nationalism ,e)Enlightenment values ,f)European Nationalism and Indian Nationalism	Lectures with Presentation and Case Studies	6
3	Social Reform Movements a) British Rule and Indian introspection ,b)Raja Rammohan Roy, c) social reform movements in 19th century , d)Swami Vivekanand ,e)The women issue ,f)Caste system	Lectures with Presentation and Case Studies	6
4	Indian National Movement a)Early Revolts and 1857 Revolt, b)Early Nationalists ,c) Bang Bhang Movement , d) Gandhi led Mass Movements, e) Socialist and Left trends , f) Princely States and their integration into nation, h)Partition and Independence .	Lectures with Presentation and Case Studies	6
5	India after independence a)Making of Indian Constitution ,b) Post Independent Nehru Era , c) India facing Wars , d) Indian econmy- From Planning to LPG ,e) Achievements, f) Challenges in 21st century India.	Lectures with Presentation and Case Studies	6

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0	0			

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	0	1	1	0	1	1	1	2	2	1	1	1	1	1	1
CO2	0	1	2	1	0	1	1	1	1	1	0	1	2	1	1
CO3	0	1	2	1	0	1	1	1	1	1	0	1	2	1	1
CO4	0	0	1	1	1	2	2	2	2	1	1	2	2	2	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Engineering Graphics
Course Code	MEL0202[T]

Part A

Year	1st	**Semester**	2nd	**Credits**	L	T	P	
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basic knowledge of geometrical construction, sketching, imagination etc.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To get the fundamentals of engineering graphics, geometrical construction and its applications.**(BL1-Remember)** **CO2-** To understand the basic concept of engineering graphics through real-life examples. **(BL2-Understand)** **CO3-** To implement the different engineering graphics concepts over appropriate drawing dataset. **(BL3-Apply)** **CO4-** To analyze the drawing performance of engineering graphics techniques.**(BL4-Analyze)** **CO5-** To evaluate the drawing performance of engineering graphics techniques on a corresponding object.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure)				

Part B

Modules	Contents	Pedagogy	Hours
Unit-1	1. Drafting tools, 2. Principles of Graphics, 3. Geometrical constructions 4. Scales: Plain, diagonal, 5. Curves used in engineering practice: such as ellipse, parabola, hyperbola by different methods. Cycloidal curves, Involutes and Spirals.	Whiteboard, PPT	8
Unit-2	1. Types of projection, Orthographic projections, First angle and third angle projection. 2. Projections of points in different quadrants. Projections of lines, True inclination and true length of straight line, Traces.	Whiteboard, PPT	8
Unit-3	Projections of planes: Perpendicular plane, oblique plane and Auxiliary plane, projection of planes with inclined to one or both the reference planes and traces of planes.	Whiteboard, PPT	8
Unit-4	1. Projection of solids: Polyhedron and solids of revolution, projection of solids with inclined to one or both the reference planes. 2. Introduction to Section of solids and Development of surfaces.	Whiteboard, PPT	8
Unit-5	1. Isometric projection: Isometric scale, isometric projections from orthographic drawing. 2. Computer Aided Drafting (CAD): Introduction, benefit, software's, basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD.	Whiteboard, PPT	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Experiment -1	Drawing sheet of plane scale.	Experiments	BL3-Apply	2
Experiment -2	Drawing sheet of diagonal scale.	PBL	BL3-Apply	2
Experiment -3	Drawing sheet of ellipse.	PBL	BL3-Apply	2
Experiment -4	Drawing sheet parabola and hyperbola		BL3-Apply	2
Experiment -5	Drawing sheet of cycloidal curves.		BL3-Apply	2
Experiment -6	Drawing sheet of orthographic projection		BL3-Apply	2
Experiment -7	Drawing sheet of projection of line		BL3-Apply	2
Experiment -8	Drawing sheet of projection of plane.		BL2-Understand	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	1. N.D.Bhatt Elementary of Enginnering Drawing Charotar Publication P.S. Gill Engineering Drawing Kataria Publication Agrawal and Agrawal Engineering Drawing TMH
Articles	
References Books	Venu Gopal K Engineering Drawing New age K.L. Narayana& P. Kannaiah Engineering Drawing SCITECH Pub.
MOOC Courses	https://nptel.ac.in/courses/112103019
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	2	-	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	2	-	2	2	1	2	-	-	3	3	-	-	3	2	2
CO3	-	-	2	1	1	-	-	-	2	1	-	-	3	2	2
CO4	-	1	2	3	1	-	-	-	-	-	-	-	3	-	2
CO5	-	1	1	2	1	-	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Evaluation of Industrial Training -1
Course Code	CED0301[P]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	C
					0	0	2	2
Course Type	Lab only							
Course Category	Projects and Internship							
Pre-Requisite/s	subject knowledge of first and second semester .			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions**(BL2-Understand)** **CO2-** To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the university**(BL2-Understand)** **CO3-** To promote cooperation and to develop synergetic collaboration between industry and the university in promoting a knowledgeable society**(BL3-Apply)** **CO4-** Develop the confidence require for group living and sharing of responsibilities of acquire leader ship qualities and democratic attitudes. **(BL4-Analyze)** **CO5-** Develop the capacity to meet emergencies and natural disasters and practice national integration and social harmony**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✓ Environment ✕	**SDG (Goals)**						

Part B

Modules	Contents	Pedagogy	Hours
1	Students have to submit a report on training and give a presentation on his/her experience	Presentation	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Industrial training has its own importance in a career of a student who is pursuing a professional degree. It is considered as a part of college curriculum. The objective of an industrial training is to provide us an insight regarding internal working of companies. We understand that theoretical knowledge is not enough for a successful professional career. With an aim to go beyond academics, industrial visit provides students a practical perspective of the work place. Industrial trainings provide an opportunity to learn practically through interaction, working methods and employment practices.	Field work	BL3-Apply	40
Module-II	It gives students an exposure to current work practices as opposed to possibly theoretical knowledge being taught at college. Industrial visits provide an excellent opportunity to interact with industries and know more about industrial environment. Industrial trainings are arranged by TAP cell with an objective of providing us an opportunity to explore different sectors like IT, Manufacturing services, finance and marketing. Industrial visit helps to combine theoretical knowledge with practical knowledge. Industrial realities are opened to the students through industrial visits/trainings.	Field work	BL4-Analyze	40 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	50				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	2	0	1	0	2	1	3	2	3	2	0	2	1	1	2
CO2	2	1	0	0	2	1	2	3	3	2	1	2	2	1	1
CO3	2	1	0	0	2	1	3	3	2	2	0	2	2	2	1
CO4	2	0	1	0	2	0	3	2	2	2	0	2	1	2	1
CO5	2	1	0	0	2	1	3	3	3	2	0	2	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Strength of Materials
Course Code	CEL0302[P]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					0	0	1	1
Course Type	Lab only							
Course Category	Foundation core							
Pre-Requisite/s	Mechanics			**Co-Requisite/s**				
Course Outcomes & Bloom's Level								
Coures Elements	Skill Development ✕ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1		Presentation	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1		Experiments		

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Timushenko. S. P. and Young, Strength of Material, East-West Press
Articles	
References Books	R K Bansal, Strength of Material, Laxmi Publication
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Strength of Materials
Course Code	CEL0302[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					3	0	0	3
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	a complete description of the geometry of the member, its constraints, the loads applied to the member and the properties of the material of which the member is composed.			**Co-Requisite/s**	Mechanics			
Course Outcomes & Bloom's Level	**CO1-** Students will revise the concept of Mechanics and Forces **(BL1-Remember)** **CO2-** To understand the basic concept of analysis and design of members subjected to torsion also the analysis and design of structural elements such as columns and struts**(BL2-Understand)** **CO3-** Students are able to Take the Data Concerning strength of various structural elements**(BL3-Apply)** **CO4-** To suggest suitable material from among the available in the field of construction and manufacturing**(BL4-Analyze)** **CO5-** To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts **(BL4-Analyze)** **CO6-** To Complete Determination of SFD, BMD and Deflection of Different Structural Elements**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Simple Stresses & strains: Concept of elastic materials & isotropic materials, various types of stresses & strains, elastic constants, stresses in compound, composite and tapering bars, temperature stresses, Generalized Hooke's law. Complex Stresses & Strains: Two dimensional analyses of stresses and strains with graphical representation. Theory of failure	problem based learning, experimental learning, field trips,case study	10
2	Bending & Shear Stresses: Theory of simple and pure bending. Moment curvature relationship. Distribution of bending and shear stresses across the various sections	problem based learning, experimental learning, field trips,case study	10
3	Deflection computation of determinate beams using Double Integration Methods, Macaulay's Method, Conjugate Beam Method and Moment- Area Method	problem based learning, experimental learning, field trips,case study	8
4	Columns & Struts: Euler's theory of buckling of columns with different end conditions, Effective Length, slenderness ratio, Rankine Formulae, Eccentric loading on columns, slender column.	problem based learning, experimental learning, field trips,case study	8
5	Unsymmetrical Bending & Shear Center: Bending of a beam in a plane which is not a plane of symmetry. Shear center, Curved beams: Pure bending of curved beams of rectangular, circular I sections, Stress distribution and position of neutral axis.	problem based learning, experimental learning, field trips,case study	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Comparative study of tensile strength of different types of steel	PBL	BL4-Analyze	10
2	Comparative study of hardness of steel with other available materials	PBL	BL4-Analyze	10
3	To study the mechanical Properties of metals	Experiments	BL4-Analyze	2
4	To perform torsion test on mild steel rod	Experiments	BL3-Apply	2
5	To determined impact strength of steel (charpy test)	Experiments	BL4-Analyze	2
6	To determined impact strength of steel (izod test)	Experiments	BL4-Analyze	2
7	To determine brinell hardness numbers for mild steel	Experiments	BL5-Evaluate	2
8	To determine the rock well hardness numbers for steel	Experiments	BL4-Analyze	2
9	To determine the tensile strength of mild steel	Experiments	BL4-Analyze	2
10	Analysis of simply supported beam with ANSYS	Experiments	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	Timushenko. S. P. and Young, Strength of Material, East-West Press
Articles	https://www.google.co.in/books/edition/A_Textbook_of_Strength_of_Materials/2IHEqp8dNWwC?hl=en&gbpv=1&dq=strength+of+materials&printsec=frontcover
References Books	R K Bansal, Strength of Material, Laxmi Publication
MOOC Courses	https://nptel.ac.in/courses/112106141
Videos	https://www.youtube.com/watch?v=8CP714_wKVk

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	3	-	-	-	-	2	-	-	3	3	-	-	3	2	3
CO2	3	1	2	2	2	2	2	1	3	3	1	-	3	3	3
CO3	3	2	-	-	-	-	-	-	2	2	1	-	2	3	2
CO4	1	2	2	2	2	-	2	2	-	-	2	1	3	2	3
CO5	2	2	1	-	-	-	-	1	2	1	2	-	2	2	3
CO6	3	2	2	1	-	-	-	1	2	2	2	-	2	3	2

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Concrete Technology
Course Code	CEL0303[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					3	0	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Students must have knowledge of Structural Materials			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of Construction materials**(BL1-Remember)** **CO2-** To understand & analyze the different function of ingredients of concrete**(BL2-Understand)** **CO3-** To implement the different designing concrete mix design**(BL3-Apply)** **CO4-** To provide experimental basis, and to enable the students to analyze and test the concrete properties **(BL4-Analyze)** **CO5-** To evaluate the applications of different special types of concrete**(BL5-Evaluate)** **CO6-** To apply the understanding of destructive and non destructive testing of concrete**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Stones: Occurrence, varieties, Characteristics and their testing, uses, quarrying and dressing of stones. Timber: Important timbers, their engineering properties and uses, defects in timber, seasoning and treatment. Brick and Tiles: Manufacturing, characteristics, classification and uses, improved brick from inferior soils. Flooring tiles and other tiles.	lecture with problem based learning, experimental learning, field trips,case study	10
2	Miscellaneous Construction Materials: Use of fly ash in mortars, lime, Fly ash bricks, Stabilized mud blocks, D.P.C. materials, Building materials made by industrial & agricultural wastes, clay products, P.V.C. materials, advance materials for flooring, doors & windows, Aluminum & glass composites.	lecture with problem based learning, experimental learning, field trips,case study	10
3	Concrete: Introduction: classification, properties, grades, advantage & disadvantages of concrete. Ingredients of concrete, manufacturing and types of cement, aggregates, water and admixtures. Properties of Fresh and Hardened Concrete: Workability-Testing of fresh concrete, Compressive & Tensile strength Characteristics of hardened concrete: Shrinkage and Creep of concrete temperature effects, durability,	lecture with problem based learning, experimental learning, field trips,case study	10
4	Design of Concrete Mix: Introduction, Various classical methods of concrete mix design , Mix design using I.S. code method-basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete. Production and Quality Control of Concrete, curing at different temperatures. field control, Inspection & Testing of Concrete	lecture with problem based learning, experimental learning, field trips,case study	8
5	Special Concrete : Brief Introduction of Concreting underwater, hot & cold weather condition, Light weight concrete, Ready mix concrete, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Rubble concrete, Resin concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.	lecture with problem based learning, experimental learning, field trips,case study	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To determine the water absorption, compressive strength and efflorescent effect of brick	Experiments	BL5-Evaluate	3
2	To determine the normal consistency, initial and final setting time of cement	Experiments	BL4-Analyze	3
3	To determine the soundness of cement	Experiments	BL3-Apply	3
4	To determine the bulking of sand	Experiments	BL3-Apply	3
5	To determine the compressive strength of cement mortar	Experiments	BL5-Evaluate	3
6	To determine the density & water absorption of aggregates	Experiments	BL4-Analyze	3
7	To determine the workability of concrete by slump cone test/ compaction factor test	Experiments	BL4-Analyze	3
8	To determine the compressive strength of concrete cube	Experiments	BL5-Evaluate	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	1. S.C. Rangwala - Engineering Materials. , 2. Varshney RS - Concrete Technology; Oxford& IBH publishing co. 3. M S Shetty - Concrete Technology.
Articles	https://civiltechnicalguruji.wordpress.com/wp-content/uploads/2018/07/advanced-concrete-technology-zongjin-li.pdf
References Books	M S Shetty - Concrete Technology.
MOOC Courses	https://archive.nptel.ac.in/courses/105/102/105102012/
Videos	https://civiltechnicalguruji.wordpress.com/wp-content/uploads/2018/07/advanced-concrete-technology-zongjin-li.pdf

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1	-	-	-	-	-	2	2	3	3	2	2
CO2	3	2	2	1	-	-	-	-	-	2	2	2	2	3	2
CO3	3	3	2	2	-	-	-	-	-	1	3	2	2	3	2
CO4	3	2	3	2	2	-	-	-	1	2	2	3	3	2	2
CO5	3	3	2	2	2	-	-	-	2	2	3	2	3	3	3
CO6	3	2	3	3	-	-	-	-	1	1	2	3	3	2	2

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Highway and Traffic Engineering
Course Code	CEL0313[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	C
					3	0	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basics of Materials			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will be able to get Awareness about the road planning & Traffic problems of the country.**(BL1-Remember)** **CO2-** To introduce the knowledge of Highway Planning**(BL1-Remember)** **CO3-** Students are able to have knowledge of Highway Planning, Alignment, Construction & maintenance of roads**(BL2-Understand)** **CO4-** To knowledge of Traffic Jamming & its solutions on Highways & Minimize The numbers of road accidents**(BL2-Understand)** **CO5-** To design Highways**(BL3-Apply)** **CO6-** To be able to construct roads**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG1(No poverty) SDG2(Zero hunger) SDG3(Good health and well-being) SDG4(Quality education) SDG5(Gender equality) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG8(Decent work and economic growth) SDG10(Reduced inequalities) SDG11(Sustainable cities and economies) SDG12(Responsible consuption and production) SDG13(Climate action) SDG14(Life below water) SDG15(Life on land) SDG17(Partnerships for the goals)				

Part B

Modules	Contents	Pedagogy	Hours
1	High way planning, Alignment & Geometric Design: Principles of highway planning, road planning in India and financing of roads, classification patterns. Requirements, Engg. Surveys for highway location.	Experimental learning , case study ,field trips,problem based learning	10
2	Cross sectional elements- width, camber, super-elevation, sight distances, extra widening at curves, horizontal and vertical curves, numerical problems.	Experimental learning , case study ,field trips,problem based learning	10
3	Bituminous & Cement Concrete Payments: Design of flexible pavements, Design of Rigid pavements using IRC charts WBM, , surface dressing, interfacial treatment- seal coat, tack coat, prime coat, wearing coats, grouted macadam, bituminous concrete specification, construction and maintenance. Advantages and disadvantages of rigid pavements, general principles of design, types, construction, maintenance and joints, dowel bars, tie bars	Experimental learning , case study ,field trips,problem based learning	8
4	Low Cost Roads, Drainage of Road and testing: Principles of stabilization, mechanical stabilization, requirements, advantages, disadvantages and uses, quality control, macadam roads-types, specifications, construction, maintenance and causes of failures, highway materials, properties and testing, Channelized and unchannelised intersections, at grade & grade separated intersections, description, rotary-design elements, advantages and disadvantages. Evaluation and maintainance of pavements.	Experimental learning , case study ,field trips,problem based learning	9
5	Traffic Characteristics: road user's Characteristics-general human characteristics, physical, mental and emotional factors, factor affecting reaction time, PIEV theory, vehicular characteristics: characteristics affecting road design width, height, length, and other dimensions. Weight, power, speed and breaking capacity of a vehicle. Traffic studies: - spot speed studies and volume studies, speed and delay studies purpose, causes of delay, method of conducting speed and delay studies. Origin and destination studies: various method, collection and interpretation of data. Traffic capacity studies: volume, density, Mass transportation.	Experimental learning , case study ,field trips,problem based learning	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	CBR Test	Experiments	BL3-Apply	2
2	Abrasion Test	Experiments	BL3-Apply	2
3	Impact Test	Experiments	BL4-Analyze	2
4	Specific Gravity Test	Experiments	BL2-Understand	2
5	Bitumen Adhesion	Experiments	BL4-Analyze	2
6	Penetration Test	Experiments	BL3-Apply	2
7	Viscosity Test	Experiments	BL4-Analyze	2
8	Ductility Test	Experiments	BL5-Evaluate	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	Khanna S. K. , Justo C. E. G. Highway & Traffic Engineering, Nem Chand Publishers
Articles	https://www.google.co.in/books/edition/Highway_Engineering/86QEEAAAQBAJ?hl=en&gbpv=1&dq=justo+khanna&printsec=frontcover
References Books	Kadiyali L.R, Highway Engineering, Khanna Publications
MOOC Courses	https://nptel.ac.in/courses/105105107
Videos	https://www.youtube.com/watch?v=k117-foOK_Y&list=PLk7ptZcI9vmgQsUoS5XcIIoFVi383V6E9

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	2	3	-	2	3	2	2
CO2	3	2	2	2	-	-	-	-	2	-	-	-	3	2	2
CO3	2	3	1	1	-	-	-	-	1	2	1	-	2	2	2
CO4	2	3	2	1	-	-	-	-	-	-	-	2	2	3	2
CO5	3	2	2	2	-	-	-	-	2	2	-	-	3	3	2
CO6	3	2	2	3	1	-	-	-	-	2	-	1	3	1	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Elementary design of structures (RCC)
Course Code	CEL0331[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					3	0	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basics of Materials Properties and Knowledge of Mechanics			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will be able to get knowledge about Structural Members**(BL1-Remember)** **CO2-** To introduce the knowledge of Beams and Slab Designs**(BL2-Understand)** **CO3-** Students are able to understand yield Line theory of Slabs**(BL2-Understand)** **CO4-** To analyze the concept of Soft Storey**(BL4-Analyze)** **CO5-** To Apply Codal Provision in designing methods**(BL3-Apply)** **CO6-** To be able to create different basic elements of a building**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Basic Principles of Structural Design : Assumptions, Mechanism of load transfer, Various properties of concrete and reinforcing steel, Introduction to working stress method and limit state methods of design, partial safety factor for load and material.	Experimental learning , case study ,field trips,problem based learning	10
2	Design of Beams: Singly & Doubly reinforced sections	Experimental learning , case study ,field trips,problem based learning	8
3	Design of Slabs: One way slab, Two way slab, Yield line theory	Experimental learning , case study ,field trips,problem based learning	8
4	Concept of Soft Storey: Mechanism of load transfer in soft storey, Stiffness and Stability criteria, Design problems	Experimental learning , case study ,field trips,problem based learning	8
5	Design and drawing details of the various RCC structures, Discussion of Codal provisions of IS 456-2000, SP-16.	Experimental learning , case study ,field trips,problem based learning	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Patterns of Reinforcements in Beams	Experiments	BL3-Apply	2
2	Patterns of Reinforcements in Columns	Experiments	BL3-Apply	2
3	Patterns of Reinforcements in Slabs	Experiments	BL3-Apply	2
4	Types of Beams	Experiments	BL2-Understand	2
5	Types of Columns	Experiments	BL2-Understand	2
6	Types of Slab	Experiments	BL2-Understand	2
7	Drawings of Beams in AutoCad	Experiments	BL4-Analyze	2
8	Drawings of Columns in AutoCad	Experiments	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	1. B.C. Punmia Ashok Kumar Jain, RCC Designs, Laxmi Publication 2. A.K. Jain, Reinforced Concrete: Limit State Design, Nem Chand & Brothers
Articles	https://www.google.co.in/books/edition/Reinforced_Concrete_Structures_Vol_I/6g1fu4pRDCkC?hl=en&gbpv=1&dq=design+of+rcc+structures&printsec=frontcover
References Books	N.Krishnaraju, Design of R.C structures, CBS Publishers and distributors
MOOC Courses	https://nptel.ac.in/courses/105105104
Videos	https://www.youtube.com/watch?v=x2_W127EFrU&list=PLH1Yxo6h9TZk49Yx84IbpJeYfe87Kt69I

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	3	3	-	-	2	3	2
CO2	1	-	1	1	1	2	-	-	2	3	-	-	3	2	2
CO3	-	-	2	1	-	-	-	-	2	1	-	-	3	2	2
CO4	-	-	2	3	1	-	-	-	-	-	-	-	3	2	2
CO5	-	1	-	2	1	-	-	-	-	-	-	-	3	1	2
CO6	-	1	-	2	2	2	-	-	2	-	-	-	2	2	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Building Planning and Drawing
Course Code	CEL0333[P]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					0	0	2	2
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s	Students must have basic knowledge of Engineering Graphics and Building Elements			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To Remember basic fundamentals of building Design**(BL1-Remember)** **CO2-** To Understand the concept of drawing basic elements of buildings**(BL2-Understand)** **CO3-** To Analyse different techniques for different views of building**(BL4-Analyze)** **CO4-** To apply knowledge of different plans on real life building strutures**(BL3-Apply)** **CO5-** To develop plans of superstructure and substructure details of a building**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Appreciate types of Drawings and its importance, Draw various types of Projections. Use building drawing Symbols, Conventions, and Abbreviations, Apply various types of scales as per needs.	problem based learning, experimental learning,case study	5
2	Apply the Bye-laws and Principles of Planning for residential and other public buildings.	problem based learning, experimental learning,case study	6
3	Develop concept plan of buildings, Prepare detail drawings for single and two storied residential building and public building	problem based learning, experimental learning,case study	8
4	Generate perspective view of simple building by different methods, Develop building models	problem based learning, experimental learning,case study	5
5	Draw details of parts of buildings, provide scope and provisions for building components and services	problem based learning, experimental learning,case study	4

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Interpretation of building drawings approved under local authority	Experiments	BL2-Understand	2
2	Draw symbols , conventions and Abbreviations in sketch book	Experiments	BL2-Understand	2
3	Study of building by-laws act and national building code (NBC)	Experiments	BL3-Apply	2
4	Draw detail plan on drawing sheet - 1 plan ,elevation and section of existing building (actual Measurement Drawing)	Experiments	BL3-Apply	2
5	Draw detail of foundation plan of one room building /two room building in sketch book	Experiments	BL4-Analyze	2
6	Draw working drawings sheet -2 for single storied residential building (bunglow)on 250sq.m plot with scale and show following detail: GF & FF plan with elevation, section and opening schedule	Experiments	BL4-Analyze	2
7	Prepare concept plan of any one other type of building considering local bye laws: high school building, Shopping centre, Hospital and Industrial Building in sketch book.	Experiments	BL4-Analyze	2
8	Develop perspective view of single room residential building with verandah & steps by any methods.	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	0

Part E

Books	R. S. Malek G. S. Meo, Civil Engineering Drawing, New Asian Delhi
Articles	https://www.hitechcaddservices.com/news/types-of-building-drawings/
References Books	B. H. Shukla, Civil Engineering Drawing, Atul Prakashan Ahmedabad
MOOC Courses	https://www.mooc-list.com/course/3d-cad-application-coursera
Videos	https://www.youtube.com/watch?v=abr2elb24Ps&list=PLAhtOI5kcFk2sgnaaZQaTfqEpd3G5iY6B

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	-	2	2	1	-	-	2	2	2	1	-	-
CO2	1	2	2	2	1	2	2	-	-	-	2	2	3	3	3
CO3	2	1	2	-	-	-	2	2	-	-	-	2	3	-	3
CO4	1	2	2	3	2	-	2	1	-	-	2	2	3	2	2
CO5	1	-	-	1	-	-	1	-	-	-	-	1	-	1	2
CO6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Building Planning and Drawing
Course Code	CEL0333[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	
					3	1	1	5
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s	Students must have basic knowledge of Engineering Graphics and Building Elements			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To Remember basic fundamentals of building Design**(BL1-Remember)** **CO2-** To Understand the concept of drawing basic elements of buildings**(BL2-Understand)** **CO3-** To Analyse different techniques for different views of building**(BL4-Analyze)** **CO4-** To apply knowledge of different plans on real life building strutures**(BL3-Apply)** **CO5-** To develop plans of superstructure and substructure details of a building**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Appreciate types of Drawings and its importance, Draw various types of Projections. Use building drawing Symbols, Conventions, and Abbreviations, Apply various types of scales as per needs.	problem based learning, experimental learning,case study	5
2	Apply the Bye-laws and Principles of Planning for residential and other public buildings.	problem based learning, experimental learning,case study	6
3	Develop concept plan of buildings, Prepare detail drawings for single and two storied residential building and public building	problem based learning, experimental learning,case study	8
4	Generate perspective view of simple building by different methods, Develop building models	problem based learning, experimental learning,case study	5
5	Draw details of parts of buildings, provide scope and provisions for building components and services	problem based learning, experimental learning,case study	4

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Interpretation of building drawings approved under local authority	Experiments	BL2-Understand	2
2	Draw symbols , conventions and Abbreviations in sketch book	Experiments	BL2-Understand	2
3	Study of building by-laws act and national building code (NBC)	Experiments	BL3-Apply	2
4	Draw detail plan on drawing sheet - 1 plan ,elevation and section of existing building (actual Measurement Drawing)	Experiments	BL3-Apply	2
5	Draw detail of foundation plan of one room building /two room building in sketch book	Experiments	BL4-Analyze	2
6	Draw working drawings sheet -2 for single storied residential building (bunglow)on 250sq.m plot with scale and show following detail: GF & FF plan with elevation, section and opening schedule	Experiments	BL4-Analyze	2
7	Prepare concept plan of any one other type of building considering local bye laws: high school building, Shopping centre, Hospital and Industrial Building in sketch book.	Experiments	BL4-Analyze	2
8	Develop perspective view of single room residential building with verandah & steps by any methods.	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	0

Part E

Books	R. S. Malek G. S. Meo, Civil Engineering Drawing, New Asian Delhi
Articles	https://www.hitechcaddservices.com/news/types-of-building-drawings/
References Books	B. H. Shukla, Civil Engineering Drawing, Atul Prakashan Ahmedabad
MOOC Courses	https://www.mooc-list.com/course/3d-cad-application-coursera
Videos	https://www.youtube.com/watch?v=abr2elb24Ps&list=PLAhtOI5kcFk2sgnaaZQaTfqEpd3G5iY6B

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	-	2	2	1	-	-	2	2	2	1	-	-
CO2	1	2	2	2	1	2	2	-	-	-	2	2	3	3	3
CO3	2	1	2	-	-	-	2	2	-	-	-	2	3	-	3
CO4	1	2	2	3	2	-	2	1	-	-	2	2	3	2	2
CO5	1	-	-	1	-	-	1	-	-	-	-	1	-	1	2
CO6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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CELEBRATING DREAMS

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Engineering Mathematics
Course Code	MAL0308[T]

Part A

Year	2nd	**Semester**	3rd	**Credits**	L	T	P	C
					4	0	0	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	Basic knowledge of equations			**Co-Requisite/s**	Basic knowledge of roots			
Course Outcomes & Bloom's Level								
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG4(Quality education)				

Part B

Modules	Contents	Pedagogy	Hours
Unit 1	Introduction to numerical computing, Approximation and error in numerical computations, Numerical solution of algebraic and Transcendental equations. Regula-Falsi method, Newton-Raphson method, Graffes-Root squaring method, Iterative method. Solution of simultaneous linear equation, Gauss-Elimination method, Jacobi's method Gauss- Seidel method Iterative method. Numerical differentiation and integration(Trapezoidal rule Simpson's 1/3rd rule , Simpson's 3/8rule)	lecture with Board , Quiz, Seminar,	8
Unit 2	Difference operators, Interpolation: Newton's forward and backward method, Lagrange method, Central difference interpolation, Numerical solution of ordinary differential equations: Picard's method, Euler method, Modified Euler method and Runge- Kutta Method, Numerical solution of partial differential equation: Elliptic (Laplace Equation), Parabolic (Heat conduction equation)	lecture with Board , Quiz, Seminar,	8
Unit 3	Laplace Transform: Laplace Transform of elementary functions, Laplace Transform of derivatives, integrals and multiplication by t^n and division by t, Inverse Laplace Transform., convolution Theorem (application only), application to solution of differential equations.	lecture with Board , Quiz, Seminar,	8
Unit 4	Fourier transform, Fourier complex transform Fourier integral theorem, Fourier sine and cosine transform of simple function of derivatives, Finite Fourier sine & cosine transform, inverse of Fourier transform, Application to differential equation, solution of one dimensional heat and wave equations through Fourier transform.	lecture with Board , Quiz, Seminar,	8
Unit 5	Transform: Definition of Z -transform, Z-transform of simple sequences. Properties of Z -transform. Initial and final value theorem, Inverse Z -transform, partial fraction method, convolution theorem, residue method, Application to finite difference equation.	lecture with Board , Quiz, Seminar,	8

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100		40	12	60	28
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0				

Part E

Books	1. B.V.Ramana, Higher Engineering Mathematics, Tata McGraw Hill 2. B.S.Grewal, Higher Engineering Mathematics ,Khanna Publishers 3. H.K.Das and R. Verma, Higher Engineering Mathematics, S.Chand and Company Pvt.Ltd.
Articles	
References Books	1. E.Kreyszig, Advanced Engineering Mathematics ,John Wiley and Sons, 1999 2. M.K.Jain, S.R.K.Iyengar and R.K.Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publishers. 3. T. Veerajan and T. Ramachandran, Theory and Problems in Numerical Methods, Tata McGraw Hill
MOOC Courses	https://onlinecourses.nptel.ac.in/noc24_ma36/preview
Videos	https://onlinecourses.nptel.ac.in/noc24_ma36/preview

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	-	-	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	-	-	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	-	-	-	2	1	-	-	-	-	-	-	-	2	3	3
CO5	-	-	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fluid Mechanics
Course Code	CEL0406[T]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	C
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	subject knowledge of engineering mechanics and physics			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** • CO1: To remember the various concepts of fluid mechanics**(BL1-Remember)** **CO2-** • CO2: To understand & analyze the different fluid flow problems.**(BL2-Understand)** **CO3-** • CO3: To implement the different designing concepts of fluid mechanics.**(BL3-Apply)** **CO4-** • CO4: To provide experimental basis ,and to enable the students to analyze the behaviour of various in fluids and its characterstics.**(BL4-Analyze)** **CO5-** • CO5: To evaluate the applications of fluids in various fields such as research&industries.**(BL4-Analyze)** **CO6-** • CO6: To apply the understanding of fluids in identifying the fluids and its different types.**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
Unit-1	Characteristics of fluids; continum concepts; physical properties – bulk modulus; cohesionand adhesion; vapor pressure; surface tension; Newton's Law of viscosity – Newtonian and Non-Newtonian fluids; Pascal's law; pressure variation; scales and methods of pressure measurement; forces acting on plane and curve surfaces; stability of floating and submerged bodies.	Lectures with problem based learning, experimental learning,case study,field trips	10
Unit-2	Kinematics of Flow : Types of flow-ideal & real , steady & unsteady, uniform & non-uniform, one, two dimensional flow, path lines, streak lines, streamlines and stream tubes; continuity equation for one dimensional flow, rotational &irrotational flow, circulation, stagnation point, separation of flow, sources & sinks, velocity potential, stream function, flownets& Utility.	Lectures with problem based learning, experimental learning,case study,field trips	10
Unit-3	Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, application of Bernoulli's equation, energy correction factor, linear momentum equation for steady flow; momentum correction factor. The moment of momentum equation.Forces on fixed and moving vanes and other applications. Fluid Measurements: Velocity measurement (Pitot tube, current meters etc); flow measurement (orifices, nozzles, mouth pieces, venturimeter).	Lectures with problem based learning, experimental learning,case study,field trips,	10
UNit-4	Laminar Flow: Introduction to laminar & turbulent flow, Reynolds experiment & Reynolds number, relation between shear & pressure gradient, laminar flow through circular pipes, laminar flow between parallel plates, laminar flow through porous media, Stokes law, lubrication principles, Major & minor head losses in pipe.	Lectures with problem based learning, experimental learning,case study,field trips,	8
Unit-5	Dimensional Analysis: Introduction, dimensional homogeneity, use of Buckingham-pi theorem, calculation of dimensionless numbers, application of similarity laws to model & prototype. Machines:Introduction to different types of turbines and Pumps Pelton, Francis and Kaplan Turbine, Centrifugal Pumps: Reciprocating Pump	Lectures with problem based learning, experimental learning,case study,field trips,	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
2	To determine Cv, Cc and Cd for orifice meter	Experiments	BL3-Apply	3
3	To determine Cv, Cc and Cd for venturi meter	Experiments	BL2-Understand	3
4	Find the losses due to friction in pipe	Experiments	BL4-Analyze	3
5	Find the losses due to pipe fitting.	Experiments	BL2-Understand	3
6	Find the Cd for Nozzle meter.	Experiments	BL3-Apply	3
7	Find the meta-centric height.	Experiments	BL2-Understand	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0

Part E

Books	Dr. R.K. Bansal
Articles	https://books.google.co.in/books?id=0clZbfwgiyUC&printsec=copyright&redir_esc=y#v=onepage&q&f=false
References Books	Modi and Seth
MOOC Courses	https://www.mooc-list.com/tags/fluid-mechanics#google_vignette
Videos	https://www.youtube.com/watch?v=PgKsr2_-oxc

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	2	2	-	-	3	3	-	-	3	3	2
CO2	3	1	2	2	3	1	-	1	3	3	-	-	3	3	1
CO3	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-
CO4	1	2	3	2	2	-	3	2	-	-	2	1	3	2	2
CO5	1	1	1	2	-	1	-	-	-	-	-	-	-	-	-
CO6	1	2	1	1	1	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fundamentals of Surveying
Course Code	CEL0407[T]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	subject knowledge of linear measurement, geometry			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** • CO1:To remember the various concepts of surveying.**(BL1-Remember)** **CO2-** • CO2:To understand & analyze the horizontal vertical & inclined measurements. **(BL2-Understand)** **CO3-** • CO3:To implement the different instrumentation techniques.**(BL3-Apply)** **CO4-** • CO4: To provide experimental basis,and to enable the studentstoanalyzetheRLs of different levels.**(BL4-Analyze)** **CO5-** • CO5:To evaluate the land areas & volume of earth work.**(BL5-Evaluate)** **CO6-** • CO6: To apply the understand inglocation of of fininte points **(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Principles and classifications of surveying, chain surveying- basic concepts, terminology and instruments used. Plane table surveying: Principle, methods and equipments, two and three point problems and their solutions Leveling: Principle, terminology and instrumentation, booking of leveling readings, reduction of levels, profile leveling, cross-sectioning and reciprocal leveling. Contouring	Lectures with problem based learning, experimental learning,case study,field trips	10
2	Traversing by Compass: different types of bearings and their measurement systems, Different types of compasses for the measurement of bearings, compass traversing and closing error and its adjustments. Traversing by theodolite, Field work checks, traverse computations, latitude and departures, plotting & adjusting of traverse, omitted measurements.	Lectures with problem based learning, experimental learning,case study,field trips	10
3	Tachometry: Tachometric systems and principles, uses of anallatic lens, tangential system,subtense system, instrument constant, field work reduction, direct-reading tacheometers, use of tacheometry for traversing and contouring. Trigonometrical leveling.	Lectures with problem based learning, experimental learning,case study,field trips	10
4	Curves: Classification and use; elements of circular curves, calculations, setting outCurves by offsets and by theodolites, compound curves, reverse curves, transition curves,Vertical curves Introduction to DGPS	Lectures with problem based learning, experimental learning,case study,field trips	10
5	Control Surveys: Providing frame work of control points, triangulation principle,Reconnaissance, selection and marking of stations, angle measurements and corrections, baseline Measurement and corrections, computation of sides, precise traversing, Introduction & principlesof hydrographic survey.	Lectures with problem based learning, experimental learning,case study,field trips	

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	chain surveying	Experiments	BL3-Apply	3
2	compass surveying	Experiments	BL3-Apply	3
3	dumpy level	Experiments	BL2-Understand	3
4	plane table survey	Experiments	BL2-Understand	3
5	auto level survey	Experiments	BL3-Apply	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0

Part E

Books	N.N. Basak
Articles	https://books.google.co.in/books/about/Surveying_Vol_I.html?id=EM-sLyVmMwIC&redir_esc=y
References Books	Dr. B.C. Punmia
MOOC Courses	https://www.mooc-list.com/tags/surveys
Videos	https://www.youtube.com/watch?v=chhuq_t40rY

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	3	1	3	2	2	2	1	1	-	-	3	2	1
CO2	1	2	1	1	1	2	1	2	1	2	3	-	3	3	1
CO3	1	1	1	2	1	-	-	-	-	-	-	-	-	-	-
CO4	1	2	3	1	3	3	3	2	1	2	-	2	3	3	1
CO5	1	1	1	-	2	-	-	-	-	-	-	-	-	-	-
CO6	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fundamentals of Geotechnical Engineering
Course Code	CEL0408[T]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	C
					3	1	1	5
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	basic knowledge of soil and its properties			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** CO1: To remember the various concepts in theory of geotechnical engineering. **(BL1-Remember)** **CO2-** • CO2: To understand & analyze the different geotechnical engineering problems. **(BL2-Understand)** **CO3-** • CO3: To implement the shear strength parameters, consistency limits used in geotechnical engineering.**(BL3-Apply)** **CO4-** • CO4: To provide experimental basis, and to enable the students to suggest the type of shear tests to be conducted depending on soil conditions and the type of earth pressure depending on the wall conditions.**(BL2-Understand)** **CO5-** • CO5: To evaluate the stress distribution in soils and stability of slopes. **(BL5-Evaluate)** **CO6-** • CO6: To apply the understanding of index properties of soil, stress distribution and flow net in soil in solving problems of type of stresses in soil and compressibility and consolidation theories in soil. **(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Basic Definitions & Index Properties: Definition and scope of soil mechanics, Historical development. Formation of soils. Soil composition. Minerals, Influence of clay minerals on engineering behaviour. Soil structure. Three phase system. Index properties and their determination. Consistency limits. Classification systems based on particle size and consistency limits.	Lectures with problem based learning, experimental learning,case study,field trips	10
2	Soil Water and Consolidation: Soil water, Permeability Determination of permeability in laboratory and in field. Seepage and seepage pressure. Flow nets, uses of a flownet,calculation of stresses. Compressibility and consolidation, Relationship between pressure and void ratio, Theory of one dimensional consolidation. Consolidation test, Fitting Time curves. Normally and over consolidated clays. Determination of preconsolidation pressure, settlement analysis. Calculation of total settlement.	Lectures with problem based learning, experimental learning,case study,field trips	10
3	Stress Distribution in Soils and Shear Strength of Soils: Stress distribution beneath loaded areas by Boussinesq and water gaurd's analysis. Newmark's influence chart. Contact pressure distribution. Mohr - Coulomb's theory of shear failure of soils, Mohr's stress circle, Measurement of shear strength, Shear box test, Triaxial compression test, unconfined compression test, Value shear test, Measurement of pore pressure, pore pressure parameters, critical void ratio, Liquefaction.	Lectures with problem based learning, experimental learning,case study,field trips	10
4	Slopes and stabilization of soil. Types of slope failures, Rotational slips. Stability number. Effect of ground water. Selection of shear strength parameters in slope stability analysis. Analytical and graphical methods of stability analysis. Stability of Earth dams. STABILIZATION OF SOIL: Introduction, Mechanical stabilization, Cement stabilization, Lime stabilization, Bituminous stabilization, Chemical stabilization, Thermal stabilization, Electrical stabilization, Stabilization by grouting, Use of geo-synthetic materials, Types, Functions and applications of geo-synthetics, Reinforced earth structures-components and construction.	Lectures with problem based learning, experimental learning,case study,field trips	10
5	Lateral Earth Pressure: Active, passive and earth pressure at rest. Rankine, Coulomb, Terzaghi and Culmann's theories. Analytical	Lectures with problem based learning, experimental learning,case study,field trips	10

	and graphical methods of determination of earth pressures on cosion-less and cohesive soils. Effect of surcharge, water table and wallfriction. Arching in soils. Reinforced earth retaining walls.		

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	casagrande apparatus	Experiments	BL2-Understand	3
2	permeability test	Experiments	BL3-Apply	3
3	sieve analysis	Experiments	BL2-Understand	3
4	water content	Experiments	BL2-Understand	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	

Part E

Books	Gopal Ranjan and Rao
Articles	https://books.google.com.na/books?id=U2AvQrA6l4sC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
References Books	Dr. B.C.Punmia
MOOC Courses	https://onlinecourses.nptel.ac.in/noc22_ce74/preview
Videos	https://www.youtube.com/watch?v=V1m3cB-Aqy8

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	2	2	-	3	3	1	2	2	3	3	2
CO2	1	2	2	2	2	2	-	2	2	3	1	3	2	3	3
CO3	1	1	1	2	1	-	-	-	-	-	-	-	-	-	-
CO4	1	2	2	3	2	3	-	3	3	3	3	2	3	3	2
CO5	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Basic Methods of Structural Analysis
Course Code	CEL0409[T]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	basic knowledge of structure			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** • CO1: Toremembertheconcept of SFD and BMD.**(BL1-Remember)** **CO2-** • CO2:Tounderstand & analyze the Rolling Loads.**(BL2-Understand)** **CO3-** • CO3:To implement and analyze the different theorems on Beams **(BL4-Analyze)** **CO4-** • CO4:Toanalyze the sway portal frames**(BL4-Analyze)** **CO5-** • CO5:ToevaluatetheArches and their thrust conditions.**(BL5-Evaluate)** **CO6-** • CO6:Tocreate appropriate loading conditions for different complex and indeterminate structures**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Strain Energy in tension, compression, torsion and bending, Castigliano's theorems, virtual work principles, Force analysis of Compound and complex trusses, Tension co-efficient method – application to simple space trusses. Deflection of determinate pin jointed frames using Castigliano's theorem, principle of virtual work, Unit load method & Graphical method (Williot- Mohr diagram)	Lectures with problem based learning, experimental learning,case study,	10
2	Rolling loads and influence lines: Maximum S.F. and B.M curves for various types of rolling loads, focal length , EUDL, influence lines for shear force and bending moment for determinate beams. Influence lines for member forces in pin jointed trusses & arches.	Lectures with problem based learning, experimental learning,case study,field trips	10
3	Two & Three hinged arches, cables and suspension bridges, Unstiffened & stiffened, Eddy's theorem, fixed arches.	Lectures with problem based learning, experimental learning,case study,field trips	10
4	Analysis of Indeterminate Structures: Statistical and kinematic indeterminacy, stability of structures. Analysis of fixed and continuous beams by three-moment theorem, Method of consistent deformation and energy methods. slopes and deflections of statically Indeterminate beams	Lectures with problem based learning, experimental learning,case study,field trips	10
5	Analysis of non sway frames by moment distribution and slope deflection methods and energy method, Effect of sinking of support	Lectures with problem based learning, experimental learning,case study,field trips	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
2		PBL		

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Wang C.K
Articles	https://www.scribd.com/document/466472190/Intermediate-Structural-Analysis-Wang-pdf
References Books	Kinney Streling J-Addison Wesley
MOOC Courses	https://www.mooc-list.com/tags/structural-engineering
Videos	https://www.youtube.com/watch?v=cRG8UbzMTdk

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	1	1	3	2	1	1	2	1	2	3	3	1
CO2	1	2	1	1	1	1	1	2	2	3	1	3	2	3	3
CO3	1-	2	1	1	2	-	-	-	-	-	-	-	-	-	-
CO4	1	2	2	3	2	3	-	3	3	3	3	2	3	3	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Elementary Design of Structures (Steel)
Course Code	CEL0432[T]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basics of Autocad, Limit State Design and Working Stress Method			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember basic types of loading and steel structures**(BL1-Remember)** **CO2-** To understand different types of connections in steel members**(BL2-Understand)** **CO3-** To implement the knowledge of IS Code for Structural Design of Steel members**(BL3-Apply)** **CO4-** To Design different members like flexural and compression**(BL2-Understand)** **CO5-** To evaluate the different loading conditions according to different connections**(BL2-Understand)** **CO6-** To Create a Structural member fir for Different Loading Conditions**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Various loads and mechanism of the load transfer, partial load factors, structural properties of steel, design of structural connections- bolted, riveted and welded connections.	Lectures with problem based learning, experimental learning,case study,field trips	8
2	Design of Bolted and Riveted Connections	Lectures with problem based learning, experimental learning,case study,field trips	10
3	Design of Welded Connections.	Lectures with problem based learning, experimental learning,case study,field trips	8
4	Design of Tension members and bracing systems.	Lectures with problem based learning, experimental learning,case study,field trips	10
5	Design of Compression members.	Lectures with problem based learning, experimental learning,case study,field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Analysis of different compressive strength of column for different sizes	PBL	BL4-Analyze	3
2	Tensile structure using steel chain connections	PBL	BL6-Create	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	

Part E

Books	S.K. Duggal, Steel Structure, T.M.H Publication
Articles	https://pdfcoffee.com/design-of-steel-structure-3rd-edition-by-s-k-duggal-4-pdf-free.html
References Books	S.S. Bhavikatti, Design of Steel Structure, Vikas Publication
MOOC Courses	https://www.my-mooc.com/en/mooc/introduction-steel-tenarisuniversity-steel101x-1/
Videos	https://www.youtube.com/watch?v=_sG6L8Abfss

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	3	3	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	3	3	1	2	-	2	-	-	2	3	-	-	2	2	1
CO3	2	2	2	-	-	-	-	-	2	1	-	-	1	-	1
CO4	1	1	2	3	1	-	-	-	-	-	-	-	2	-	2
CO5	1	1	1	2	1	-	-	-	-	-	-	-	2	-	2
CO6	-	-	-	-	-	-	-	-	2	2	-	-	1	2	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	OOPM
Course Code	CSP0401[P]

Part A

Year	2nd	**Semester**	4th	**Credits**	L	T	P	
					0	0	2	2
Course Type	Lab only							
Course Category	Discipline Core							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the basic programming concept**(BL1-Remember)** **CO2-** Understand the basics of Python like python origin downloading and installing and basic concept of python**(BL2-Understand)** **CO3-** Apply the various conditional and looping statement and functional programming. **(BL3-Apply)** **CO4-** Explain various objects numbers and sequence in python Analyze the concept of regular expression.**(BL4-Analyze)** **CO5-** Evaluate the concept of object-oriented programming for better utilization of language.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
Unit 1	Introduction to Python programming Introduction, origin of Python, Downloading, Installing and Running Python, Python Basics: Comment, Identifier, Indentations, Basic data types, conversions, operators, Build in functions. I/O Statements, Condition Statements & Loops: If, else, elif), conditional expressions, while, for, break continue	Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs	8
Unit 2	Data Structures in Python Lists: Introduction, Accessing list, Operations, Working with lists, Tuple: Introduction, Accessing tuples, Operations, Working with list, Dictionaries: Introduction, Accessing values in dictionaries, Working with dictionaries, Set: Introduction ,Accessing set, Operations, Working with sets	Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs	8
Unit 3	Functions, Modules, File Handling Functions: Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous function, Global and local variables, Recursion. Modules: Creating modules, Importing module, Packages, File Handling :Opening and closing files, Reading and writing files	Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs	8
Unit 4	Exceptional Handling, Regular Expressions Exception Handling: Exception, Exception Handling, Try and Except clause, User Defined Exceptions, Exception handling in files). Regular Expressions: Introduction/motivation, special symbols and characters for REs , Match function, Search function., Matching VS Searching., Modifiers, Patterns.	Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs	9
Unit -5	Object Oriented Programming in Python Introduction, OOPS Basics: Class and object, Constructors, Need of Encapsulations, Attributes, default attributes, static attributes, static methods, initializing objects, Pass by reference , self. Relational-ships: Introduction, Aggregation, Dependency. Inheritance: Need of Inheritance, Overriding, Super, Types of Inheritance. Abstract Class, methods.	Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
unit 1-2	Practical Assignment	Experiments	BL2-Understand	7
1-5	Activity Based Learning	Experiments	BL3-Apply	10

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Interna Evaluation**
	100	60			
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	2	2	-	-	-	2	-	-	1	-	1
CO2	1	2	1	2	2	2	-	-	-	2	-	-	1	-	3
CO3	2	2	1	-	1	-	-	-	-	-	-	-	3	2	3
CO4	2	2	-	3	1	-	-	-	-	-	-	-	3	3	3
CO5	2	2	-	2	1	-	-	-	-	-	-	-	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Industrial Training
Course Code	CED0501[P]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	C
					0	0	2	2
Course Type	Lab only							
Course Category	Projects and Internship							
Pre-Requisite/s	Basic Knowledge of Civil Engineering			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions**(BL2-Understand)** **CO2-** To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the university**(BL2-Understand)** **CO3-** To promote cooperation and to develop synergetic collaboration between industry and the university in promoting a knowledgeable society**(BL3-Apply)** **CO4-** Develop the confidence require for group living and sharing of responsibilities of acquire leader ship qualities and democratic attitudes. **(BL4-Analyze)** **CO5-** Develop the capacity to meet emergencies and natural disasters and practice national integration and social harmony**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✓ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Students have to submit a report on training and give a presentation on his/her experience	Presentation	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Industrial training has its own importance in a career of a student who is pursuing a professional degree. It is considered as a part of college curriculum. The objective of an industrial training is to provide us an insight regarding internal working of companies. We understand that theoretical knowledge is not enough for a successful professional career. With an aim to go beyond academics, industrial visit provides students a practical perspective of the work place. Industrial trainings provide an opportunity to learn practically through interaction, working methods and employment practices.	Field work	BL3-Apply	40
Module-II	It gives students an exposure to current work practices as opposed to possibly theoretical knowledge being taught at college. Industrial visits provide an excellent opportunity to interact with industries and know more about industrial environment. Industrial trainings are arranged by TAP cell with an objective of providing us an opportunity to explore different sectors like IT, Manufacturing services, finance and marketing. Industrial visit helps to combine theoretical knowledge with practical knowledge. Industrial realities are opened to the students through industrial visits/trainings.	Field work	BL4-Analyze	40 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	P
CO1	2	0	1	0	2	1	3	2	3	2	0	2	1	1	2
CO2	2	1	0	0	2	1	2	3	3	2	1	2	2	1	1
CO3	2	1	0	0	2	1	3	3	2	2	0	2	2	2	1
CO4	2	0	1	0	2	0	3	2	2	2	0	2	1	2	1
CO5	2	1	0	0	2	1	3	3	3	2	0	2	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Hydraulics & fluid machine
Course Code	CEL0510[T]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Students should have the knowledge of basic concepts of Fluid Mechanics			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** CO1: To remember the various concepts of fluid machines.**(BL1-Remember)** **CO2-** CO2: To understand & analyze the different fluid flow problems.**(BL2-Understand)** **CO3-** CO3: To implement the different designing concepts of fluid machines.**(BL3-Apply)** **CO4-** CO4: To provide experimental basis, and to enable the students to analyze the working of various machines and its different components.**(BL4-Analyze)** **CO5-** CO5: To evaluate the applications of fluids in various fields such as research & industries.**(BL5-Evaluate)** **CO6-** CO6: To apply the understanding of fluids in identifying the fluids and its different types.**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Turbulent flow : Laminar and turbulent boundary layers and laminar sub layer, hydro dynamically smooth and rough boundaries, velocity distribution in turbulent flow, resistance of smooth and artificially roughened pipes.	Lectures with problem based learning, experimental learning, case study, field trips	10
2	Pipe flow problems : Losses due to sudden expansion and contraction, losses in pipe fittings and valves, concepts of equivalent length, hydraulic and energy gradient lines, siphon, pipes in series, pipes in parallel, branching of pipes. Study of weir and notches (rectangular, triangular, trapezium section) Pipe Network : Water Hammer , transmission of power, Hardy Cross Method.	Lectures with problem based learning, experimental learning, case study, field trips	9
3	Uniform flow in open channels : Channel geometry and elements of channel section, velocity distribution, energy in open channel flow, specific energy, types of flow, critical flow and its computations, uniform flow and its computations, Chezy's and Manning's formulae, determination of normal depth and velocity, Normal and critical slopes, Economical sections.	Lectures with problem based learning, experimental learning, case study, field trips	9
4	Non uniform flow in open channels : Basic assumptions and dynamic equations of gradually varied flow, characteristics analysis and computations of flow profiles, rapidly varied flow hydraulic jump in rectangular channels and its basic characteristics, alternate depth in term of Froude's number surges in open channels & channel flow routing, venturi flume.	Lectures with problem based learning, experimental learning, case study, field trips	10
5	Turbines : Pelton turbine-their construction and settings, characteristic curves. Reaction turbines: construction & settings, draft tube theory, cavitation. Pumps: Centrifugal pumps : Various types and their important components, net positive suction head, specific speed, cavitation, principle of working and characteristic curves. Reciprocating pumps: Principle of working, Coefficient of discharge, slip, single acting and double acting pump, Manometric head, Acceleration head.	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Impact of Jets	Experiments	BL2-Understand	4
2	To study the characteristics of Hydraulic Jumps	Experiments	BL4-Analyze	4
3	To study the characteritics of Pelton Turbine	Experiments	BL5-Evaluate	4
4	To study the characteristics of Francis Turbine	Experiments	BL3-Apply	4
5	To study the characteristics of Kaplar Turbine	Experiments	BL4-Analyze	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Hydraulics & Fluid Machines by P N Modi & Seth Hydraulic Machanics - K.R. Arora
Articles	https://archive.nptel.ac.in/courses/112/103/112103249/
References Books	Fluid mechanics and hydraulic machine - Dr. R.K. Bansal
MOOC Courses	https://archive.nptel.ac.in/courses/112/103/112103249/
Videos	https://books.google.co.in/books/about/Fluid_Mechanics_Hydraulic_Machines.html?id=-EZJzwEACAAJ&source=kp_cover&redir_esc=y

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	2	1	-	2	-	-	2	-	1	3	1	2
CO2	1	-	1	-	-	1	-	2	-	1	-	2	1	3	-
CO3	-	1	1	2	-	1	-	2	1	2	-	1	2	3	1
CO4	1	2	-	-	2	1	-	2	1	-	2	1	-	1	2
CO5	1	-	-	-	1	2	-	1	2	-	2	1	-	1	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Surveying
Course Code	CEL0511[T]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Students should have the basic knowledge of fundamentals of surveying			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** CO1: Students will revise the concept of Surveying with its Principles. **(BL1-Remember)** **CO2-** CO2: Students are able to understand the surveying with advance instrument like remote sensing, GPS and GIS, hydrographic survey and Arial Photogrammetry.**(BL2-Understand)** **CO3-** CO3: Students are able to Take the Data concerning different types of Surveying Instruments.**(BL3-Apply)** **CO4-** CO4:To analyze Indeterminate structures and towers according to dynamic loading**(BL4-Analyze)** **CO5-** CO5: Students will be able to Process the GIS and GPS and Hydrographic Data and evaluate the Different Dimensions of Image projections**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Modern equipments for surveying: Digital levels and theodolites, Electronic Distance measurement (EDM), Total Station and Global Positioning Systems (GPS), Digital Planimeter.	Lectures with problem based learning, experimental learning, case study, field trips	10
2	Hydrographic Surveying: various type of survey for hydrographic, sounding, method of observation, equipment for sounding, computations and plotting, discharge measurement, area measurement, rain gauging, marine surveying.	Lectures with problem based learning, experimental learning, case study, field trips	8
3	GPS Surveying: Introduction & components of GPS, Space segment, control segment and user segment, Elements of Satellite based surveys-Map datum, GPS receivers, GPS observation methods and their advantages over conventional methods.	Lectures with problem based learning, experimental learning, case study, field trips	10
4	Photogrammetry: Principle, definitions and classifications of terrestrial and aerial photogrammetry, flight planning for aerial photography, scale and relief displacements of vertical aerial photographs, stereoscopic vision on vertical photographs, computation of position, length and elevations of objects using photographs and photo mosaic.	Lectures with problem based learning, experimental learning, case study, field trips	8
5	Remote Sensing: Principle, components, classification, remote sensing data acquisition process, different types of remote sensing satellite imagery with special relevance to Indian Remote Sensing Satellites (IRS) and applications. Geographic Information Systems (GIS): Definition, components and advantages.	Lectures with problem based learning, experimental learning, case study, field trips	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To study the intersection method of Plane Table Survey	Field work	BL2-Understand	4
2	To study the contouring for different levels	Field work	BL3-Apply	4
3	To study the Resection method by Plane Tabling	Field work	BL4-Analyze	4
4	To determine levels by Reciprocal Levelling	Field work	BL5-Evaluate	4
5	To determine the location by Global Positioning System	Field work	BL6-Create	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Interna Evaluation**
0	0	0	0	0	0

Part E

Books	Advance Surveying volume II & III - B.C.Punmia
Articles	https://khannapublishers.in/index.php?route=product/product&path=60&product_id=142, Advanced-Surveying-Station-Remote-Sensing/dp/8131700674
References Books	Advanced Surveying Vol. II - S.K. Duggal
MOOC Courses	http://acl.digimat.in/nptel/courses/video/105107121/L22.html
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	3	3	-	1	3	-	2
CO2	1	-	1	2	1	3	-	-	3	3	-	2	3	2	2
CO3	-	1	-	1	2	-	2	-	1	-	-	-	3	2	2
CO4	1	-	1	2	2	-	2	-	1	-	-	-	3	-	2
CO5	-	-	1	2	2	-	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fundamentals of Structural design(RCC)
Course Code	CEL0512[T]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	C
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Student should have the basic knowledge of structures & drawing concepts			**Co-Requisite/s**	Students have to follow the concept of Structural drawing			
Course Outcomes & Bloom's Level	**CO1-** • CO1: To remember the various concepts in theory of Rcc structures**(BL1-Remember)** **CO2-** • CO2: To understand & analyze the different Rcc components along with the guidelines of Indian Standard Code IS 456-2000.**(BL3-Apply)** **CO3-** • CO3: To implement the different designing concepts of Rcc.**(BL3-Apply)** **CO4-** • CO4: To provide experimental basis, and to enable the students to analyze the behaviour of various Rcc structures and its Functional properties**(BL2-Understand)** **CO5-** • CO5: To evaluate the applications of different Rcc structural members in various fields such as research & industries.**(BL3-Apply)** **CO6-** • CO6: To apply the understanding of different Rcc problems in identifying the quality of Rcc and its different types**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Basic Principles of Structural Design : Assumptions, Mechanism of load transfer, Various properties of concrete and reinforcing steel, Introduction to working stress method and limit state methods of design, partial safety factor for load and material.	Lectures with problem based learning, experimental learning, case study, field trips	9
2	Design of Beams: Singly & Doubly reinforced sections.	Lectures with problem based learning, experimental learning, case study, field trips	10
3	Design of Slabs: Slabs spanning in one & two direction, Yield line theory	Lectures with problem based learning, experimental learning, case study, field trips	10
4	Columns & Footings: Design of column of various cross section, Design of various footings	Lectures with problem based learning, experimental learning, case study, field trips	9
5	Staircases: Staircases with waist slab having equal and unequal flights with different support conditions, tread-riser staircase.	Lectures with problem based learning, experimental learning, case study, field trips	7

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Types of Bars	Field work	BL6-Create	4
2	Types of Column	PBL	BL6-Create	2
3	Beam Design	PBL	BL5-Evaluate	3
4	Staircase	PBL	BL6-Create	2
5	One Way lab		BL4-Analyze	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	RCC Designs B.C. Punmia Laxmi Publications.
Articles	https://books.google.co.in/books/about/Reinforced_Concrete_Structures_Vol_I.html?id=6g1fu4pRDCkC&redir_esc=y
References Books	Reinforced Concrete Design, New Age Publication House Krishna Raju New Age Publishers
MOOC Courses	
Videos	https://archive.nptel.ac.in/courses/105/105/105105105/

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	2	-	1	2	1	2	-	-	3	3	-	-	3	2	2
CO3	1	-	1	-	-	-	-	-	-	2	1	-	3	2	2
CO4	1	1	2	2	1	-	-	-	-	-	-	-	3	-	2
CO5	-	-	1	-	2	1	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Methods of Structural Analysis
Course Code	CEL0514[T]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	
					3	1	0	4
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Students should have the basic knowledge in Engg. Mechanics, Strength of Materials, etc			**Co-Requisite/s**	Analyzing Reactions			
Course Outcomes & Bloom's Level	**CO1-** • CO1:Students will revise the concept of Conventional Methods of analysis of Determinate Structures**(BL2-Understand)** **CO2-** • CO2:To make the student familiar with latest computational techniques used for structural analysis.**(BL4-Analyze)** **CO3-** • CO3:Students are able to apply these methods for analyzing the indeterminate structures to evaluate the response of structures**(BL3-Apply)** **CO4-** • CO4:To analyze Indeterminate structures and towers according to dynamic loading**(BL4-Analyze)** **CO5-** • CO5:Students will be able to determine response of structures by classical, iterative and matrix methods**(BL5-Evaluate)** **CO6-** • CO6:To enable the student get a feeling of how real-life structures behave.**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Moment distribution and slope deflection methods in analysis of frames with sway, analysis of box frame, analysis of beams and frames by Kani's method.	Lectures with problem based learning, case study	8
2	Plastic analysis of beams and frames	Lectures with problem based learning, case study	10
3	Analysis of tall frames, wind and earthquake loads, codal provisions, Approximate analysis of multistory frames for vertical and lateralloads	Lectures with problem based learning, case study	9
4	Matrix method of structural analysis: force method and displacement Method	Lectures with problem based learning, case study	9
5	Influence lines for intermediate structures by using Muller Breslau Principle	Lectures with problem based learning, case study	10

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Prototype analysis in framed strctures	PBL	BL5-Evaluate	12

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0

Part E

Books	Intermediate structural analysis Wang C k McGraw Hill, New York
Articles	https://archive.nptel.ac.in/courses/105/105/105105166/
References Books	Theory of structure Dhanpat rai Publications S. Ramamutham
MOOC Courses	
Videos	https://www.youtube.com/watch?v=qhEton-EEOw

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	2	-	-	-	-	1	-	-	-	-	-	-	-
CO2	2	-	1	2	2	-	-	-	2	-	-	-	-	-	-
CO3	1	-	1	2	-	-	2	1	-	-	-	-	-	-	-
CO4	1	2	-	1	-	-	1	1	-	-	-	-	-	-	-
CO5	1	-	-	2	-	2	2	-	2	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Geotech Engineering
Course Code	CEL0515[T]

Part A

Year	3rd	**Semester**	5th	**Credits**	L	T	P	C
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Foundation core							
Pre-Requisite/s	Students should have the knowledge of basics of Geo technical Engineering			**Co-Requisite/s**	Students will attain general practice of lab testing of soil.			
Course Outcomes & Bloom's Level	**CO1-** CO1: Students will revise the concept of mechanics of soil.**(BL2-Understand)** **CO2-** CO2: Students are able to understand the concept of excavation and different types of foundations.**(BL2-Understand)** **CO3-** CO3: Students are able to apply the knowledge of different foundations for construction practices.**(BL3-Apply)** **CO4-** CO4: To analyze different theories of bearing capacities and settlements regarding structures.**(BL4-Analyze)** **CO5-** CO5: Students will be able to conduct several tests and evaluate different parameters of foundation**(BL6-Create)** **CO6-** CO6: To complete foundation work at a construction site.**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Soil Exploration and Foundations on Expansive and Collapsible soils: Methods of soil exploration. Planning of exploration programme for buildings, highways and earth dams. Disturbed and undisturbed samples and samplers for collecting them. Characteristics of expansive and collapsible soils, their treatment, Construction techniques on expansive and collapsible soils. CNS layer	Lectures with problem based learning, experimental learning, case study, field trips	10
2	Shallow Foundations: Type of foundations shallow and deep. Bearing capacity of foundation on cohesion less and cohesive soils. General and local shear failures. Factors effecting B.C. Theories of bearing capacity -Prandle, Terzaghi, Skempton, Meyerhof and Hansan. I.S. code on B.C. Determination of bearing capacity. Limits of total and differential settlements. Plate load test	Lectures with problem based learning, experimental learning, case study, field trips	9
3	Sheet piles/Bulkheads and Machine foundation: Classification of sheet piles/bulkheads. Cantilever and anchored sheet piles, Cofferdams, materials, types and applications. Modes of vibration. Mass-spring analogy, Natural frequency. Effect of vibration on soils. Vibration isolation. Criteria for design. Design of block foundation for impact type of machine.	Lectures with problem based learning, experimental learning, case study, field trips	9
4	Deep Foundation: Pile foundation, Types of piles, estimation of individual and group capacity of piles in cohesion less and cohesive soils. Static and dynamic formulae.. Pile load test, Settlement of pile group, Negative skin friction, under- reamed piles and their design. Piles under tension, inclined and lateral load Caissons.	Lectures with problem based learning, experimental learning, case study, field trips	10
5	Well foundation. Equilibrium of wells. Analysis for stability tilts and shifts, remedial measures.	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To determine the consistency of soil by Casagrande'ss Appratus	Experiments	BL4-Analyze	4
2	To determine dry density by Standard Proctor Test	Experiments	BL5-Evaluate	4
3	To determine particle size distribution by sieve analysis method	Experiments	BL2-Understand	4
4	To determine specific gravity by Pycnometer	Experiments	BL4-Analyze	4
5	To apply permeabilty test	Experiments	BL6-Create	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	30
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Soil Mechanics & Foundation Engg. B.C. Punamia Geotech. Engg - C.Venkatramaiah
Articles	https://www.hzu.edu.in/engineering/Geotechnical_Engineering.pdf
References Books	Soil Mechanics and Foundation - Dr. K. R. Arora
MOOC Courses	
Videos	http://www.digimat.in/nptel/courses/video/105101001/L01.html, https://archive.nptel.ac.in/courses/105/101/105101001/

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	2	-	1	2	1	2	-	-	3	3	-	-	3	2	2
CO3	1	-	1	-	-	-	-	-	-	2	1	-	3	2	2
CO4	1	1	2	2	1	-	-	-	-	-	-	-	3	-	2
CO5	-	-	1	2	1	-	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Minor Project
Course Code	CED0601[P]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	
					2	1	1	4
Course Type	Project							
Course Category	Discipline Core							
Pre-Requisite/s	Knowledge of Civil engineering and interdisciplinary subjects.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To enhance writing skills and knowledge.**(BL2-Understand)** **CO2-** To increase their mental ability.**(BL3-Apply)** **CO3-** To inculcate the ability to express innovative opinion and thoughts**(BL4-Analyze)** **CO4-** To have Dissertation works as skills development in students.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Project/Problem Identification	Project Work	8
2	Project Analysis, Requirement Gathering	Project Work	8
3	Implementation of Project/Solution	Project Work	8
4	Testing and Verification	Project Work	8
5	Presentation and Report Writing	Project Work	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Identification of a problem and formulation of a topic of project/thesis	PBL	BL3-Apply	15 hrs
Module-III	Dissertation and Viva-voci	PBL	BL5-Evaluate	20 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	50				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	2	1	1	1	-	-	-	-	-	-	-	-
CO2	1	1	1	1	1	2	2	1	-	-	-	-	-	-	-
CO3	1	1	1	2	1	2	1	2	-	-	-	-	-	-	-
CO4	1	1	1	1	1	2	1	2	-	-	-	-	-	-	-
CO5	1	1	1	2	1	2	1	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Water Resource & Irrigation Engineering
Course Code	CEE0601[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					3	2	0	5
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	known about the soil properties			**Co-Requisite/s**	known about basic structure			
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of irrigation engg.**(BL1-Remember)** **CO2-** To understand & analyze the different irrigation engg problems.**(BL2-Understand)** **CO3-** To implement the different designing concepts of canal and well structures.**(BL3-Apply)** **CO4-** To provide experimental basis, and to enable the students to analyze the flood prediction.**(BL4-Analyze)** **CO5-** To evaluate the applications of different irrigation engg in various fields such as research & industries.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Hydrology : Hydrological cycle, precipitation and its measurement, recording and non recording rain gauges, estimating missing rainfall data, raingauge over a drainage area, mass rainfall curves, intensity Infiltration and infiltration indices, evaporation stream gauging, run off and its estimation, hydrograph analysis, unit hydrograph S curve hydrograph, synthetic unit hydrograph.	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Floods and Ground water: Types of floods and their estimation by different methods, probability and frequency analysis, flood routing through reservoirs and channels, flood control measures, economics of flood control, confined and unconfined aquifers, aquifer properties, hydraulics of wells under steady flow conditions, infiltration galleries. Ground water recharge necessity and methods of improving ground water storage. Water logging prevention. Salt efflorescence-causes and effects. Reclamation of water logged and salt affected lands.	Lectures with problem based learning, experimental learning, case study, field trips	9
unit III	Irrigation water requirement and soil necessity, advantages and disadvantages, types and methods. Irrigation development. types and their occurrence, suitability for irrigation purposes, wilting coefficient and field capacity,optimum water supply, consumptive use and its determination. Irrigati methodssurface and subsurface, sprinkler and drip irrigation.Duty of water, factors affecting duty and methods to improve duty, suitability of water for irrigation, crops and crop seasons, principal crops and their water requirement, crop ratio and crop roation , intensity of irrigation	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Canal irrigation: Types of canals, alignment, design of unlined and lined canals, Kennedy's and Lacey's silt theories, typical canal sections, canal losses, lininings economics.Canal falls & cross drainage works, regulators. escapes and outlets, canal transitions	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Well irrigation: Types of wells, well construction, yield tests, specific capacity level and specific yield, hydraulic design of open wells and tube wells, methods of raising well water, characteristics of pumps and their selection, interference of wells, well losses, advantages and disadvantages of well irrigation. Rain water harvesting	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	module of canal designing by khosla theory	PBL	BL4-Analyze	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Irrigation and water power engg B.c. punamia
Articles	https://muthuramanp.wordpress.com/wp-content/uploads/2020/01/ce8603-notes.pdf
References Books	Water resource and Irrigation engg by s.k. garg
MOOC Courses	https://www.mooc-list.com/tags/irrigation
Videos	https://www.youtube.com/watch?v=01ixEzcKABc

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	3	1	-	2	-	3	2	1	1	-	-	-
CO2	1	1	2	2	-	-	1	-	1	3	-	1	-	-	-
CO3	2	1	3	1	-	-	1	-	-	-	-	2	-	-	-
CO4	1	-	1	-	1	-	-	-	1	-	-	2	-	-	-
CO5	-	-	-	1	-	-	2	-	1	-	-	-	-	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Geo-synthetics and Reinforced Soil Structures
Course Code	CEE0602[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Identify the type of Geosynthetic and their relevance **(BL2-Understand)** **CO2-** Analyze &compute different properties of Geosynthetics**(BL4-Analyze)** **CO3-** Understand the emerging trends of Geosynthetic in geotechnical applications**(BL2-Understand)** **CO4-** Design the Reinforced Earth Walls using Geosynthetic material**(BL5-Evaluate)** **CO5-** Design the Reinforced Foundation using Geosynthetic materials**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Students will use different materials for soil stabilization	PBL	BL4-Analyze	15
2	Incresing the compressive strength of soil with different fibres	PBL	BL4-Analyze	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Koerner, R.M. "Designing with Geosynthetics", Prentice Hall, New Jersey, USA, 4thedition, 1999 Jewell, R.A. "Soil Reinforcement with Geotextiles", Special Publication No. 123,CIRIA, Thomas Telford. London, UK, 1996
Articles	https://www.researchgate.net/publication/330788128_A_Study_on_Geosynthetics_Material_in_soil_Reinforcement
References Books	Geosynthetics - New Horizons, Eds. G.V. Rao, PK Banerjee, J.T. Shahu, G.V. Ramana,Asian Books Private Ltd., New Delhi, 2004
MOOC Courses	https://archive.nptel.ac.in/courses/105/106/105106052/
Videos	https://www.youtube.com/watch?v=7Im_fxGLUmk&t=1s

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	2	2	3	2	2
CO2	3	2	2	2	-	-	-	-	-	-	2	2	2	2	2
CO3	3	2	2	1	-	-	-	-	-	-	2	1	3	3	3
CO4	3	2	1	1	-	-	-	-	-	-	2	1	2	2	2
CO5	3	2	2	1	-	-	-	-	-	-	1	2	2	2	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Introduction to Finite Element Analysis
Course Code	CEE0603[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the fundamental concepts of finite element method to solve engineering problems**(BL2-Understand)** **CO2-** Formulate finite element models using appropriate element selection, development ofstiffness & force matrices, and application of boundary conditions**(BL3-Apply)** **CO3-** Solve structural, thermal, and dynamic problems using the developed finite element formulations**(BL4-Analyze)** **CO4-** Demonstrate the ability to create models for structural, thermal, and fluid flow applications using commercial finite element packages**(BL3-Apply)** **CO5-** Interpret the analysis results to improve product and system design**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Comparative study of different properties of materials	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Rao, S.S., “The Finite Element Method in Engineering”, 6/e, Butterworth-Heinemann Publisher, 20
Articles	Reddy J.N, “An Introduction to Finite Element Method”, McGraw-Hill International Education, 3/e., 2005
References Books	Chandrupatla, T.R., and Belegundu, A.D., “Introduction to Finite Element in Engineering”, 4/e, Prentice Hall of India Pvt. Ltd.’, New Delhi, 2012
MOOC Courses	https://www.amrita.edu/course/introduction-to-finite-element-method/
Videos	https://www.youtube.com/watch?v=2iUnfPRk6Ro

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	2	-	-	-	-	-	-	-	3	3	1	2
CO2	3	1	2	1	-	-	-	-	-	-	-	1	3	1	1
CO3	3	1	3	1	2	-	-	-	2	-	-	1	3	2	1
CO4	3	2	2	2	2	-	-	-	2	-	-	2	3	1	1
CO5	3	3	3	3	3	-	-	-	3	-	-	3	3	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Smart Cities
Course Code	CEE0604[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will Acquaint knowledge on smart cities planning and development**(BL2-Understand)** **CO2-** Develop work break down structure, scheduling and project management of smart cities**(BL3-Apply)** **CO3-** Work out the most energy efficient technique for development of Smart Cities**(BL4-Analyze)** **CO4-** To understand the importance of different smart system**(BL2-Understand)** **CO5-** To understand latest technologies used in intelligent building**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)					

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction to Smart cities: Introduction to city planning Concept, Principle stakeholders, key trends in smart cities developments	Lectures with Presentation, Seminars	10
2	Smart Cities Planning and Development: Understanding smart cities, Dimension of smart cities, Global Standards and performance benchmarks, Practice codes, Smart city planning and development	Lectures with Presentation, Seminars	10
3	Financing smart cities development, Governance of smart cities	Lectures with Presentation, Seminars	6
4	Project management in Smart Cities: Phases, Stages of project and work break down Structure, Project organization structure, Planning, Scheduling and CPM, Project cost analysis, resource allocation & leveling, Line of balancing technique, Project monitoring and control, Project risk management	Lectures with Presentation, Seminars	8
5	Green building in smart cities: Introduction to green buildings, Rating system, Energy saving system	Lectures with Presentation, Seminars	6

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Smart material associated with smart building	PBL	BL4-Analyze	8
2	Technology involved in different construction of smart building	PBL	BL3-Apply	8
3	Model preparation on smart city	PBL	BL4-Analyze	8
4	Case study on ITS.	Case Study	BL3-Apply	10
5	Case study on smart city	Case Study	BL3-Apply	10

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Jo Beall (1997); “A city for all: valuing differences and working with diversity”; Zed books limited, London (ISBN: 1-85649-477-2)
Articles	(http://indiansmartcities.in/downloads/CONCEPT_NOTE_-3.12.2014__REVISED_AND_LATEST_.pdf)
References Books	William J. V. Neill (2004); “Urban Planning and cultural identity”; Routledge, London (ISBN: 0- 415-19747-3)
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105160/
Videos	https://www.youtube.com/watch?v=qX516jcwCKE

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS
CO1	3	2	1	2	1	1	1	-	-	-	1	1	2	1	2
CO2	3	2	1	2	1	2	1	-	-	-	1	2	2	2	3
CO3	3	2	2	1	1	2	1	-	-	-	2	1	3	2	2
CO4	2	2	2	2	1	2	1	-	-	-	1	1	3	1	1
CO5	2	2	1	1	3	1	1	-	-	-	1	1	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Basic of Structural Design (Steel)
Course Code	CEL0617[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	
					3	1	2	
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	basics of steel, strentgh of material			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of steel structures**(BL1-Remember)** **CO2-** To understand & analyze the different steel structures problems.**(BL2-Understand)** **CO3-** To implement the different designing concepts of steel structures**(BL3-Apply)** **CO4-** To provide experimental basis, and to enable the students to analyze the behaviour of various steel structures and its properties.**(BL4-Analyze)** **CO5-** To evaluate the applications of different steel structural members in various fields such as research & industries.**(BL5-Evaluate)** **CO6-** To apply the understanding of steel structure problems in identifying the quality of steel and its different types.**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Various loads and mechanism of the load transfer, partial load factors, structural properties of steel, design of structural connections- bolted, riveted and welded connections	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Design of basic structural elements-tension, compression, flexure. Provision of IS 800-2007	Lectures with problem based learning, experimental learning, case study, field trips	10
unit III	Design of trusses-angular and tubular	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Design of Simple and Compound Column base grillage foundation	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Introduction to flexural member, Design of beam-simple and built up, Laterally supported and laterally unsupported beam.	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	drawing of riveted connection	Experiments	BL2-Understand	3
II	drawing of bolted conecction	Experiments	BL2-Understand	2
III	drawing of wellded connection	Experiments	BL4-Analyze	2
IV	drawing of joints	Experiments	BL2-Understand	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	20
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Steel Structure
Articles	
References Books	Steel Structure
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	2	1	-	-	1	1	1	-	2	-	-	3
CO2	-	1	1	1	3	-	-	1	-	1	-	2	-	-	2
CO3	1	-	2	1	2	1	-	1	-	1	-	2	-	2	-
CO4	1	1	2	1	-	-	-	-	1	-	-	-	1	-	2
CO5	-	-	1	-	-	-	1	-	-	-	1	-	-	1	-
CO6	1	3	-	2	-	-	-	1	-	-	-	-	-	-	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Structural Design (RCC)
Course Code	CEL0619[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	basic knowledge of mechanics			**Co-Requisite/s**	basics of strength of materials			
Course Outcomes & Bloom's Level	**CO1-** Toremembertheva rious concepts Steel Design.**(BL1-Remember)** **CO2-** Tounderstandthe concept of design of Multi-Storey Buildings.**(BL2-Understand)** **CO3-** To implementthe different designing concepts retaining of earth work with retaining walls.**(BL3-Apply)** **CO4-** Toprovidedifferent types of structural elements as per the requirement of structure**(BL3-Apply)** **CO5-** Todesignthe silos and bunkers**(BL5-Evaluate)** **CO6-** ToCreate different RCC Complex structures with designing**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Design of Multistory Buildings - Sway and non sway buildings, Shear walls and other bracing elements	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Earth Retaining Structures: Cantilever and counter fort types retaining walls	Lectures with problem based learning, experimental learning, case study, field trips	10
unit III	Water Tanks: Tanks on ground and underground tanks: Square, rectangular, circular tanks, Overhead tanks: square, rectangular, circular &intze tanks	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Silos and Bunkers	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	T-beam & Slab bridges- for highway loading (IRC Loads). Prestressing concepts materials, systems of prestressing& losses Introduction to working & limit State Design	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	component design of silos	Experiments	BL4-Analyze	3
II	component design of water tank	Experiments	BL4-Analyze	2
III	design of bunker	Experiments	BL3-Apply	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	

Part E

Books	R.C.C Vol 2 N krishna raju
Articles	https://www.academia.edu/40762446/BC_Punmia_SURVEYING_Vol_1_By_EasyEngineering_net_1_
References Books	BC Punmia
MOOC Courses	https://onlinecourses.nptel.ac.in/noc22_ce65/preview
Videos	https://www.youtube.com/watch?v=GJHHtS2t140

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	-	-	1	-	2	-	1	1	-	-	-
CO2	1	1	2	3	1	-	1	2	-	1	1	1	-	2	-
CO3	2	3	1	2	-	1	-	1	-	-	2	1	-	-	1
CO4	1	2	1	1	1	1	-	2	-	1	-	1	-	1	-
CO5	2	-	1	-	1	2	-	-	1	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Quantity Surveying & Costing
Course Code	CEL0621[T]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					2	1	1	4
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	introduction of material			**Co-Requisite/s**	basic knowledge of materials			
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of Specification**(BL1-Remember)** **CO2-** To understand & analyze the different Quantity Estimates**(BL4-Analyze)** **CO3-** : To implement the different designing concepts of Quantity Estimation.**(BL5-Evaluate)** **CO4-** To provide experimental basis, and to enable the students to analyze the quantity and cost estimates.**(BL3-Apply)** **CO5-** To evaluate the applications of different Estimation and Costing in various fields such as research & industries.**(BL3-Apply)** **CO6-** : To apply the understanding of Rate Analysis in solving problem of Estimation**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Purpose and importance of estimates, principles of estimating methods of taking out Quantities of items of work. Mode of Measurement, Measurement sheet and adstract sheet; bills of quantities	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Types of estimate, plinth area rate, cubical content rate, preliminary original, revised and supplementary estimates different projects preparing detailed estimates of various types of Building, RCC work earth work calculations for roads and estimating of culverts. Services for building such as water supply, drainage.	Lectures with problem based learning, experimental learning, case study, field trips	9
unit III	Rate Analysis: Task for average artisan, various factors involved in the rate of an item, material and labour requirement for various trades; preparation for rates of important items of work. Current schedule of rates (C.S.R), Specification.	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Cost works : Factors affecting cost of work, overhead charges Contingencies and work charge establishment, various percentage for different services in building.	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Valuation : Purpose, depreciation, sinking fund. scrap value year's purchase, gross and net income, dual rates interest. Method of Valuation, rent fixation of buildings.	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	module of bulding	PBL	BL4-Analyze	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0

Part E

Books	BN Dutta
Articles	https://www.scribd.com/document/545528438/Estimating-and-Costing-in-Civil-Engineerng-B-N-Dutta-24th-Ed
References Books	Estimation and Costing in Civil Engineering by S. Dutta
MOOC Courses	https://www.my-mooc.com/en/mooc/construction-cost-estimating/
Videos	https://www.youtube.com/watch?v=aO3OI3XLHkI

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PS
CO1	1	2	1	3	-	2	-	2	3	3	1	-	-	-	1
CO2	-	2	3	2	3	-	-	1	-	1	-	2	-	-	1
CO3	2	-	1	3	1	-	-	1	2	-	-	1	2	-	3
CO4	1	2	-	-	1	1	-	-	2	-	-	3	-	1	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Environmental Engineering
Course Code	CEL0634[T]

Part A

<table>
<tr><td rowspan="2">Year</td><td rowspan="2">3rd</td><td rowspan="2">Semester</td><td rowspan="2">6th</td><td rowspan="2">Credits</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td>3</td><td>1</td><td>2</td><td>6</td></tr>
<tr><td>Course Type</td><td colspan="8">Embedded theory and lab</td></tr>
<tr><td>Course Category</td><td colspan="8">Discipline Core</td></tr>
<tr><td>Pre-Requisite/s</td><td colspan="3"></td><td>Co-Requisite/s</td><td colspan="4"></td></tr>
<tr><td>Course Outcomes & Bloom's Level</td><td colspan="8">CO1- To remember the various concepts in theory of sources of water.(BL1-Remember)
CO2- To understand & analyze the concept of population forecasting(BL2-Understand)
CO3- To provide experimental basis, and to enable the students to analyze physical, chemical and biological impurities(BL4-Analyze)
CO4- To evaluate the applications of rain water harvesting(BL5-Evaluate)
CO5- To apply the understanding of water treatment(BL3-Apply)</td></tr>
<tr><td>Coures Elements</td><td colspan="3">Skill Development ✓
Entrepreneurship ✓
Employability ✓
Professsonal Ethics ✕
Gender ✕
Human Values ✕
Environment ✓</td><td>SDG (Goals)</td><td colspan="4">SDG6(Clean water and sanitation)
SDG7(Affordable and clean energy)
SDG9(Industry Innovation and Infrastructure)
SDG11(Sustainable cities and economies)</td></tr>
</table>

Part B

Modules	Contents	Pedagogy	Hours
1	Sewerage schemes and their importance, collection & conveyance of sewage, storm water quantity, fluctuation in sewage flow, flow through sewer, design of sewer, construction & maintenance of sewer, sewer appurtenances, pumps & pumping stations.	Lectures with Presentation, Site Visit to STP	8
2	Characteristics and analysis of waste wate, rcycles of decomposition, physical, chemical & biological parameters. Oxygen demand i.e. BOD & COD, TOC, TOD, Th OD, Relative Stability, population equivalent, instrumentation involved in analysis, natural methods of waste water disposal i.e. by land treatment & by dilution, self purification capacity of stream, Oxygen sag analysis.	Lectures with Presentation, Seminar and experiments	8
3	Unit operations for waste water treatment, preliminary treatment such as screens, grit chamber, floatation tank, sedimentation and chemical clarification, role of micro-organism in biological treatment, Sewage filtration- theory & design.	Lectures with Presentation, Site Visit to STP	8
4	Methods of Biological Treatment (Theory & Design) - Activated Sludge process, Oxidation ditch, stabilization ponds, aerated lagoon, anaerobic lagoons, septic tank & imhoff tank, sources & treatment of sludge, sludge thickening and digestion sludge drying beds, sludge disposal.	Lectures with Presentation, Seminar and experiments	8
5	Advanced Waste Water treatment - Diatomaceorus earth filters, ultrafiltration, Adsorption by activated carbon, Phosphorus removal, Nitrogen removal, Physico chemical waste water treatment, Solid waste disposal - classification, composition, collection, & disposal methods. Rural sanitation - collection & disposal of refuse, sullage & night soil.	Lectures with Presentation, Seminar and experiments	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Physical examination of Sewage/Water: a. Total Solid b. Total dissolve solid c. Total suspended solid d. pH, color and odor	Experiments	BL4-Analyze	8
2	Chemical estimation of Sewage/Water and soil a. Determination of Chlorides b. Estimation of Chemical oxygen Demand	Experiments	BL4-Analyze	4
3	Microbial examination of Sewage/Water a. Confirmation of coliforms b. Biological oxygen demand	Experiments	BL4-Analyze	4
4	Determination of soil microbial biomass carbon	Experiments	BL4-Analyze	2
5	Examination of different bacteria, algae, fungi, plants and animals by microscopic or morphological examination	Experiments	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	0

Part E

Books	S.K.Garg, Environmental engineering volume 1 and 2 Khanna publisher B.C.Punamia Environmental engineering volume 1 and 2 Laxmi Publication
Articles	https://sciendo.com/journal/CEE
References Books	Viesman, Hammer and Chadik Water supply and pollution control PHI Publication
MOOC Courses	https://nptel.ac.in/courses/103107084
Videos	http://www.digimat.in/nptel/courses/video/105107176/L01.html

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	-	-	2	-	-	-	1	2	2	2	1
CO2	2	2	2	2	-	-	2	-	-	-	1	3	2	2	2
CO3	2	2	1	2	-	-	3	-	-	-	2	2	2	3	3
CO4	2	3	1	2	-	-	2	-	-	-	1	2	2	3	2
CO5	2	2	1	2	-	-	3	-	-	-	1	3	2	3	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Industrial training
Course Code	CED0702[P]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					0	0	2	2
Course Type	Lab only							
Course Category	Projects and Internship							
Pre-Requisite/s	Basic Knowledge of Civil Engineering			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions**(BL2-Understand)** **CO2-** To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the university**(BL2-Understand)** **CO3-** To promote cooperation and to develop synergetic collaboration between industry and the university in promoting a knowledgeable society**(BL3-Apply)** **CO4-** Develop the confidence require for group living and sharing of responsibilities of acquire leader ship qualities and democratic attitudes. **(BL4-Analyze)** **CO5-** Develop the capacity to meet emergencies and natural disasters and practice national integration and social harmony**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✓ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Students have to submit a report on training and give a presentation on his/her experience	Presentation	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Industrial training has its own importance in a career of a student who is pursuing a professional degree. It is considered as a part of college curriculum. The objective of an industrial training is to provide us an insight regarding internal working of companies. We understand that theoretical knowledge is not enough for a successful professional career. With an aim to go beyond academics, industrial visit provides students a practical perspective of the work place. Industrial trainings provide an opportunity to learn practically through interaction, working methods and employment practices.	Field work	BL3-Apply	40 hrs
Module-II	It gives students an exposure to current work practices as opposed to possibly theoretical knowledge being taught at college. Industrial visits provide an excellent opportunity to interact with industries and know more about industrial environment. Industrial trainings are arranged by TAP cell with an objective of providing us an opportunity to explore different sectors like IT, Manufacturing services, finance and marketing. Industrial visit helps to combine theoretical knowledge with practical knowledge. Industrial realities are opened to the students through industrial visits/trainings.	Field work	BL4-Analyze	40 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	50				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	1	0	2	1	3	2	3	2	0	2	1	1	2
CO2	2	1	0	0	2	1	2	3	3	2	1	2	2	1	1
CO3	2	1	0	0	2	1	3	3	2	2	0	2	2	2	1
CO4	2	0	1	0	2	0	3	2	2	2	0	2	1	2	1
CO5	2	1	0	0	3	2	3	3	3	2	1	2	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Major Project (Planning and Literature Survey)
Course Code	CED0703[P]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					0	0	2	2
Course Type	Project							
Course Category	Projects and Internship							
Pre-Requisite/s	Knowledge of Civil engineering and interdisciplinary subjects.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To enhance writing skills and knowledge.**(BL2-Understand)** **CO2-** To increase their mental ability.**(BL3-Apply)** **CO3-** To inculcate the ability to express innovative opinion and thoughts**(BL4-Analyze)** **CO4-** To have Dissertation works as skills development in students.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Project/Problem Identification	Project Work	8
2	Project Analysis, Requirement Gathering	Project Work	8
3	Writing of Literature Review	Project Work	8
4	Findings of Research Gap	Project Work	8
5	Presentation and Report Writing	Project Work	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Identification of a problem and formulation of a topic of project/thesis	PBL	BL3-Apply	15 hrs
Module-III	Dissertation and Viva-voci	PBL	BL5-Evaluate	20 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	50				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	2	1	3	3	3	2	0	2	1	1	2
CO2	2	0	1	0	1	0	2	2	3	2	0	2	2	2	1
CO3	1	1	0	0	2	1	3	3	3	2	0	1	1	1	1
CO4	2	1	1	0	1	1	3	2	2	2	0	2	1	1	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	MATRIX ANALYSIS OF STRUCTURES
Course Code	CEE0701[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will understand the concept of Axial Force Elements **(BL2-Understand)** **CO2-** Students will learn about the Stress and Strain work energy **(BL1-Remember)** **CO3-** Students will be able to analyse Shape Functions for different elements**(BL4-Analyze)** **CO4-** Students will be able to apply the matrix analysis on 2D and 3D frames and Trusses**(BL3-Apply)** **CO5-** Students will be able to understand Buckling Analysis for linear and non linear elements**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✕ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction - Review of Structures, Degrees of Freedom & Coordinate Systems, Axial Force Elements, Matrix Condensation, Matrix Condensation Example, Axial Force Elements - Global Equations, Direct Stiffness Method Mathcad Background, member truss	Lectures with problem based learning, experimental learning, case study,	8
2	Stress & Strain - Work & Energy, Axial Force & Torsional Elements, Beam Elements, Frame-Truss Example 3D Coordinate Transformations, Coord. Transformation, Space Truss, Member End Releases - Hinge Example, Virtual Displacements	Lectures with problem based learning, experimental learning, case study,	8
3	Displaced State of Elements - Shape Functions, Element Stiffness from Virtual Displacements, Stiffness Matrices from Virtual Work, Non-nodal Forces from Virtual Displacements, Thermal & Prestrain Loads by Virtual Work, Non uniform Elements, Tapered Element Example, Tapered Element/Log Shape Function	Lectures with problem based learning, experimental learning, case study,	8
4	Non uniform Torsion, Non uniform Torsion 2D vs, 3D comparison, Uniform Torsion, 8-Element Non uniform Torsion, Shear Deformations, Shear Deformation Example, Nonlinear Analysis Nonlinear Examples, Presentation Topic Proposal, Plastic Hinge Example, Matrix Non-linear Analysis, Geometric Stiffness Matrices for 2D, Geometric Stiffness Matrix Example, Geometric Stiffness Matrix Example, Presentation Outline, Nonlinear Material Behavior	Lectures with problem based learning, experimental learning, case study,	10
5	Nonlinear Material Example, Eigenvalue Buckling Analysis, Eigenvalue Buckling Example, Partially Restrained Joints, Presentation Progress Report, Member End Offsets, Restraint/Offset Example, Structural Optimization	Lectures with problem based learning, experimental learning, case study,	6

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1		PBL		

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Matrix Structural Analysis 2nd ed, by McGuire, Gallagher, and Ziemian
Articles	https://repository.bakrie.ac.id/10/1/%5BTSI-LIB-131%5D%5BAslam_Kassimali%5D_Matrix_Analysis_of_Structure.pdf
References Books	MATRIX ANALYSIS OF STRUCTURES by Aslam Kassimali
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105180/
Videos	https://www.youtube.com/watch?v=Wa9ZSWlrpnk

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	1	-	-	-	-	-	2	2	1	2	3	3
CO2	2	2	1	2	-	-	-	-	-	2	1	2	3	3	2
CO3	1	3	1	2	-	-	-	-	-	2	2	2	3	2	1
CO4	2	2	2	1	-	-	-	-	-	2	1	1	2	2	2
CO5	3	2	2	2	-	-	-	-	-	1	1	2	2	3	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Foundation Engineering
Course Code	CEE0702[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s	basic foundantion knowledge			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will revise the concept of Exploration of soil.**(BL1-Remember)** **CO2-** Students are able to understand the concept of excavation and different types of foundations.**(BL2-Understand)** **CO3-** Students are able to apply the knowledge of different foundations for construction practices.**(BL3-Apply)** **CO4-** To analyze different theories of bearing capacities and settlements regarding structures.**(BL4-Analyze)** **CO5-** Students will be able to conduct several tests and evaluate different parameters of foundation**(BL5-Evaluate)** **CO6-** To complete foundation work at a construction site.**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Different types of piles on the labs of basis of casting, function , distribution of load various factors affecting load carrying capacity of piles, pile load test, static & kinematic analysis of pile groups in sand & clays, Cast in situ pile construction	lecture with experimental learning, interactive workshops, field trips	10
2	Settlement & safe load Carrying capacity of pile foundations, laterally loaded and battered piles, group action of piles, Foundation on expansive soils, drilled piers and caissons, Elements of well foundations, shapes, depth of scour, well sinking, tilts, shift and their prevention	lecture with experimental learning, interactive workshops, field trips	08
3	Basic design criteria for foundation, design of shallow foundation, allowable, total & differential settlement, Bearing capacity effect of water table as per IS code.	lecture with experimental learning, interactive workshops, field trips	10
4	Types of coffer dams, design of cellular coffer dams.	lecture with experimental learning, interactive workshops, field trips	08
5	Modes of vibration. Mass-spring analogy, Natural frequency. Effect of vibration on soils. Vibration isolation. Criteria for design. Design of block foundation for impact type of machine.	lecture with experimental learning, interactive workshops, field trips	09

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	spt test	Field work	BL4-Analyze	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Advanced Foundation Engineering By VNS Murthy
Articles	https://easyengineering.net/advanced-foundation-engineering-book/
References Books	Advanced Foundation Engineering By B. C Punamia
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105207/
Videos	https://archive.nptel.ac.in/courses/105/105/105105207/

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	2	3	1	-	2	1	1	2	3	2	3	1
CO2	1	2	2	-	2	3	1	-	3	2	2	1	2	1	2
CO3	2	1	2	3	2	1	3	1	-	2	2	1	2	2	1
CO4	2	3	3	2	1	2	1	-	2	-	2	1	3	3	1
CO5	3	3	1	2	2	1	2	3	2	2	1	1	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Pavement Design
Course Code	CEE0703[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Systematically generate and compile required data's for design of pavement (Highway & Airfield)**(BL3-Apply)** **CO2-** Analyze stress, strain and deflection by boussinesq's, bur mister's and westergaard's theory**(BL4-Analyze)** **CO3-** Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001.**(BL4-Analyze)** **CO4-** Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements**(BL5-Evaluate)** **CO5-** Understand the various causes leading to failure of pavement and remedies for the same**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction: Desirable characteristics of pavement, Types and components, Difference between Highway pavement and Air field pavement, Design strategies of variables, Functions of subgrade, sub base, Base course, surface course, comparison between Rigid and flexible pavement Fundamentals of Design of Pavements: Stresses and deflections, Principle, Assumptions and Limitations of Boussinesq's theory, Burmister theory and problems	Lectures with Presentation, Site Visit to Highway Construction site	8
2	Design Factors: Design wheel load, contact pressure, Design life, Traffic factors, climatic factors, Road geometry, Subgrade strength and drainage, ESWL concept Determination of ESWL by equivalent deflection criteria, Stress criteria, EWL concept, and problems on above. Flexible pavement Design: Assumptions, Mcleod Method, Kansas method, CBR method, IRC Method (old), CSA method using IRC-37-2001	Lectures with Presentation, Site Visit to Highway Construction site	8
3	Flexible Pavement Failures, Maintenance and Evaluation: Types of failures, Causes, Remedial/Maintenance measures in flexible pavements, Functional Evaluation by Visual inspection and unevenness measurements, Structural evaluation by Benkleman beam deflection method, Falling weight deflecto meter, GPR method. Design factors for runway pavements, Design methods for Airfield pavement	Lectures with Presentation, Site Visit to Highway Construction site	8
4	Stresses in Rigid Pavement : Types of stress, Analysis of Stresses, Westergaard's Analysis, Modified Westergaard equations, Critical stresses, Wheel load stresses, Warping stress, Frictional stress, combined stresses (using chart / equations), problems on above. Design of Rigid Pavement: Design of CC pavement by IRC: 58-2002 for dual and Tandem axle load, Reinforcement in slabs, Design of Dowel bars, Design of Tie bars, Design factors for Runway pavements, Design methods for airfield pavements	Lectures with Presentation, Site Visit to Highway Construction site	8
5	Rigid Pavement Failures, Maintenance and Evaluation: Types of failures, causes, remedial/maintenance measures in rigid pavements, Functional evaluation by Visual inspection and unevenness measurements, wheel load and its repetition, properties of sub grade, properties of concrete. External conditions, joints, Reinforcement, Requirements of joints, Types of joints, Expansion joint, contraction joint, warping joint, construction joint, longitudinal joint, Design of joints	Lectures with Presentation, Site Visit to Highway Construction site	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Students will Collect the data from highway and develop best design	PBL	BL4-Analyze	15 hrs
2	Students will study different types of Pavements that are used in India	Case Study	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	S K Khanna, C E G Justo, and A Veeraragavan, "Highway Engineering", Nem Chand & Brothers
Articles	https://www.researchgate.net/search.Search.html?query=Pavement-Design&type=publication
References Books	L.R.Kadiyali and Dr.N.B.Lal, " Principles and Practices of Highway Engineering", Khanna publisher
MOOC Courses	https://archive.nptel.ac.in/courses/105/106/105106221/
Videos	https://www.youtube.com/watch?v=fGcgX63pBk4

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1	-	-	-	-	-	-	2	2	2	2	3
CO2	3	2	2	2	-	-	-	-	-	-	2	1	3	3	3
CO3	3	2	3	1	-	-	-	-	-	-	2	2	3	2	2
CO4	3	2	2	1	-	-	-	-	-	-	2	2	3	2	2
CO5	3	2	2	1	-	-	-	-	-	-	1	2	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Seismic analysis of structures
Course Code	CEE0704[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s	basic knowledge of Rcc and steel structure and its design provisions			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of seismic structures.**(BL1-Remember)** **CO2-** : To understand & analyze the concept of soft storeys**(BL2-Understand)** **CO3-** To implement the different designing earthquake resistant structures**(BL3-Apply)** **CO4-** : To provide experimental basis, and to enable the students to analyze and test equivalent lateral force method**(BL4-Analyze)** **CO5-** To evaluate the applications of dynamic analysis**(BL5-Evaluate)** **CO6-** : To apply the understanding of retrofitting techniques**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction to Earthquake Resistant Design, 24 IIT Kanpur Tips. .	lecture with experimental learning, interactive workshops, field trips	10
2	Equivalent lateral force method. (Code based procedure for determination of design lateral force)	lecture with experimental learning, interactive workshops, field trips	10
3	Effects of torsion on the buildings.	lecture with experimental learning, interactive workshops, field trips	08
4	Dynamic analysis. (Code based procedure for determination of design lateral force) Determination of eigen-values and eigen – vectors, model participation factor, model mass, design lateral force, storey shear	lecture with experimental learning, interactive workshops, field trips	09
5	An introduction to seismic analysis of special structures, water tower dam, chimney, bridge, nuclear power plant etc.	lecture with experimental learning, interactive workshops, field trips	08

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	tune mass demper	PBL	BL4-Analyze	3
2	comparitve studey of base isolated bulding	PBL	BL5-Evaluate	4

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Earthquake resistant design of structures by Pankaj Agarwal & Manish Shrikhande, PHI Publication House
Articles	https://www.scribd.com/document/343407200/Pankaj-Agarwal-and-Manish-Shrikhande
References Books	Earthquake resistant design of structures By Michael R. Lindeburg, Professional Publications House
MOOC Courses	https://archive.nptel.ac.in/courses/105/102/105102016/ http://www.digimat.in/nptel/courses/video/105102016/L27.html
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	3	2	1	3	-	-	-	2	3	2	1	2	1
CO2	-	2	3	1	2	2	-	-	2	-	3	2	1	1	2
CO3	2	-	1	-	2	1	3	2	-	1	-	-	2	1	-
CO4	2	2	-	3	1	1	2	2	1	3	2	1	3	3	1
CO5	2	-	1	2	2	1	-	1	2	3	2	3	2	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fundamentals of Remote Sensing & GIS
Course Code	CEE0705[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Observe, Identify and define simple/ complex problems of day to day lives present in Industry/ Society where GIS and Remote Sensing applications can be useful**(BL2-Understand)** **CO2-** Apply knowledge of basic image interpretation and data image processing.**(BL3-Apply)** **CO3-** Integrate the existing data through various observations from various angles and layer creation**(BL4-Analyze)** **CO4-** Apply problem-solving methodologies to generate, evaluate and justify innovative solutions by designing and conducting/ analyzing and interpreting the data**(BL3-Apply)** **CO5-** Demonstrate the ability to give solutions with an ability which can help communicate effectively for giving betterinterpretation and solutions**(BL4-Analyze)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)					

Part B

Modules	Contents	Pedagogy	Hours

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Projects on Water Resource Mapping and Management	PBL	BL4-Analyze	15
2	Projects on Land Use Mapping and LandResource Management	PBL	BL4-Analyze	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Lilliesand T.M. and Kiefer R.W., Remote Sensing and image Interpretation, John Wiley and Sons, New York, 2004
Articles	https://www.researchgate.net/publication/225223282_Basics_of_Remote_Sensing
References Books	Burrrough P.A and McDonnel R.A., Principles of Geographic Information Systems, Oxford university press, 1998
MOOC Courses	https://www.iirs.gov.in/pgdiploma
Videos	https://www.youtube.com/watch?v=VfDAd-MO94o

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	-	-	-	-	-	-	-	2	2	3	2	2
CO2	2	2	2	-	-	-	-	-	-	-	2	1	2	3	2
CO3	2	1	2	-	-	-	-	-	-	-	2	2	2	3	2
CO4	3	2	2	-	-	-	-	-	-	-	2	2	2	2	3
CO5	2	3	2	-	-	-	-	-	-	-	2	2	3	3	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Fluid Dynamics
Course Code	CEE0706[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will revise the concepts of fluid properties**(BL1-Remember)** **CO2-** Students will understand the concept of fluid kinematics**(BL2-Understand)** **CO3-** Students will analyse the type of boundary layer flows**(BL4-Analyze)** **CO4-** Students will be able to apply the fluid concepts for hydraulic structures**(BL3-Apply)** **CO5-** Students will be able to evaluate different flow conditions with different defined equations**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Basic Concepts and Fundamentals: Definition and properties of Fluids, Fluid as continuum, Langragian and Eulerian description,Velocity and stress field, Fluid statics, Fluid Kinematics Governing Equations of Fluid Motion: Reynolds transport theorem, Integral and differential forms of governing equations: mass, momentum and energy conservation equations, NavierStokes equations,Euler's equation,Bernoulli's Equation	Lectures with Presentation, Seminars	8
2	Exact solutions of Navier-Stokes Equations: Couette flows,Poiseuille flows, Fully developed flows in noncircular cross-sections, Unsteady flows, Creeping flows Potential Flows: Revisit of fluid kinematics,Stream and Velocity potential function, Circulation, Irrotational vortex,Basic plane potential flows: Uniform stream;Source and Sink;Vortex flow, Doublet,Superposition of basic plane potential flows, Flow past a circular cylinder, Magnus effect;Kutta-Joukowski lift theorem; Concept of lift and drag.	Lectures with Presentation, Seminars	8
3	Laminar Boundary Layers: Boundary layer equations, Boundary layer thickness, Boundary layer on a flat plate, similarity solutions, Integral form of boundary layer equations, Approximate Methods, Flow separation,Entry flow into a duct Elements of Stability Theory: Concept of small-disturbance stability, Orr-Sommerfeld equation, Inviscid stability theory,Boundary layer stability, Thermal instability, Transition to turbulence	Lectures with Presentation, Seminars	8
4	Turbulent Flow: Introduction, Fluctuations and timeaveraging, General equations of turbulent flow, Turbulent boundary layer equation, Flat plate turbulent boundary layer, Turbulent pipe flow, Prandtl mixing hypothesis, Turbulence modeling, Free turbulent flows	Lectures with Presentation, Seminars	7
5	Compressible Flows: Speed of sound and Mach number,Basic equations for one dimensional flows, Isentropic relations, Normal-shock wave, Rankine-Hugoniot relations, Fanno and Rayleigh curve, Mach waves, Oblique shock wave,PrandtlMeyer expansion waves, Quasione dimensional flows, Compressible viscous flows, Compressible boundary layers Introduction to Computational Fluid Dynamics (CFD): Boundary conditions,Basic discretization – Finite difference method, Finite volume method and Finite element method	Lectures with Presentation, Seminars	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Performance of real nozzle	Case Study	BL4-Analyze	15
2	Measurements of boundary layer thickness using numerical & analytical solution	PBL	BL4-Analyze	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Batchelor G.K,An Introduction to Fluid Dynamics, Cambridge University Press, 1983 Frank M. White, Fluid Mechanics, Tata McGraw-Hill, Singapore,Sixth Edition, 2008
Articles	https://ocw.mit.edu/courses/2-06-fluid-dynamics-spring-2013/pages/syllabus/
References Books	Frank M. White,Viscous Fluid Flow, Third Edition, McGraw-Hill Series of Mechanical Engineering, 2006
MOOC Courses	https://archive.nptel.ac.in/courses/112/106/112106200/
Videos	https://www.youtube.com/watch?v=AirfUsq8aSo&t=160s

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	-	-	-	-	-	-	-	1	1	1	2	1
CO2	3	2	2	-	-	-	-	-	-	-	1	2	1	1	2
CO3	3	2	2	-	-	-	-	-	-	-	2	1	2	2	1
CO4	3	1	2	-	-	-	-	-	-	-	1	-	1	2	1
CO5	3	2	2	-	-	-	-	-	-	-	-	1	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Wastewater Treatment and Recycling
Course Code	CEE0707[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Integrated waste management issues, collection, recovery, reuse, recycling, energy-from-waste, and landfilling**(BL3-Apply)** **CO2-** Analyze & compute the challenges of waste management for smart cities**(BL4-Analyze)** **CO3-** Understand the C&D Waste and E-Waste Management**(BL2-Understand)** **CO4-** Design the generation rates and waste composition material**(BL5-Evaluate)** **CO5-** Perform the role of MSW management within the various initiatives of the Govt. of India including: Swachh Bharat Mission, Smart Cities as well as Make in India**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG4(Quality education) SDG6(Clean water and sanitation) SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Important terminologies in waste water treatments systems: Sludge, aerobic treatments, anerobic treatments, bioengineering, biosolids, clarifiers, sewers, wetland, retention time, disinfection, influent, effluent, scum, anaerobic digestion, trickling filter, root zone treatment technology	Lectures with problem based learning, experimental learning, case study,	8
2	Sewage and waste water treatments systems: A. Primary treatment methods B. Secondary treatment methods and C. Tertiary treatment methods	Lectures with problem based learning, experimental learning, case study,	8
3	Biotechnological application of hazardous waste management and management of Resources: Use of microbial systems, Waste water treatment using root zone treatment by plants. Reclamation of wasteland: biomass production for Biogas	Lectures with problem based learning, experimental learning, case study,	7
4	Sludge disposal: Sources and effects of sludge on the environment. Methods of sludge disposal	Lectures with problem based learning, experimental learning, case study,	8
5	Wastewater Recycling: Scope and demands; Types and stages of recycling; Recycling requirements; Designated reuse criteria; centralized vs decentralized recycling systems	Lectures with problem based learning, experimental learning, case study,	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Development of Natural Filters for clean water	PBL	BL5-Evaluate	15 hrs
2	Development of Biogas chamber model	PBL	BL5-Evaluate	15 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	60	12	40	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Biotreatment Systems, Volume II ; D.L. Wise Biodegradation and Bioremediation. Academic Press; 2nd edn. Martin Alexander
Articles	https://www.researchgate.net/publication/375376650_The_Treatment_of_Wastewater_Recycling_and_Reuse_-Past_Present_and_in_the_Future
References Books	Gabriel Bitton (Author). Wastewater Microbiology, 2nd Edition. Wiley-Liss; 2nd edition (February 16, 1999).
MOOC Courses	https://onlinecourses.nptel.ac.in/noc21_ce49/preview
Videos	https://www.youtube.com/watch?v=fHRxhuMQQnE

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	-	-	2	3	-	-	-	2	2	3	3	3
CO2	3	2	2	-	-	-	3	-	-	-	2	3	2	2	2
CO3	2	2	2	-	-	2	3	-	-	-	3	2	2	2	2
CO4	2	2	3	-	-	1	3	-	-	-	2	3	2	2	2
CO5	3	2	2	-	-	2	3	-	-	-	2	3	3	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Sustainable Construction Methods
Course Code	CEE0708[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Student will be able to Classify the sustainable construction materials**(BL2-Understand)** **CO2-** Student will be able to Apply cutting-edge construction technologies**(BL3-Apply)** **CO3-** Student will be able to Evaluate different sustainable construction methods**(BL5-Evaluate)** **CO4-** Student will be able to Apply different rating systems of construction/buildings as a professional**(BL3-Apply)** **CO5-** Student will be able to Apply life cycle approach to optimize the performance of green construction materials **(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Types of foundations and construction methods. Basics of Formwork and Staging. Common building construction methods (conventional walls and slabs; conventional framed structure with blockwork walls). Modular construction methods for repetitive works	Lectures with problem based learning, experimental learning, case study, field trips	8
2	Precast concrete construction methods. Basics of Slip forming for tall structures. Basic construction methods for steel structures. Basics of construction methods for Bridges	Lectures with problem based learning, experimental learning, case study, field trips	8
3	dentification of cutting-edge sustainable construction materials, technologies, and project management strategies for use in the construction industry and evaluation of their potential to reduce the negative environmental impacts of construction activity	Lectures with problem based learning, experimental learning, case study, field trips	8
4	Study and evaluation of current LEED and GRIHA rating for construction system. Detailed case study and analysis of highly successful recent "green construction projects". Guidance to students for the LEED Green Associate professional licensing examination	Lectures with problem based learning, experimental learning, case study, field trips	8
5	Environmental impact of materials; life-cycle assessment; material selection to optimize performance; design, evaluation, and production of green construction materials	Lectures with problem based learning, experimental learning, case study, field trips	8

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	60	12	40	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Rebecca L. Henn; Andrew J. Hoffman (2013), Constructing Green the Social Structures of Sustainability (Urban and Industrial Environments), MIT Press
Articles	https://www.researchgate.net/publication/358582436_A_Study_on_Sustainable_Construction_Practices_and_Management
References Books	Kim S. Elliott, Precast Concrete Structures – 12 June 2019, CRC Press Taylor and Francis
MOOC Courses	https://archive.nptel.ac.in/courses/105/102/105102195/
Videos	https://www.youtube.com/watch?v=LdHMjhaBWxw

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	-	1	2	3	-	-	-	1	2	2	2	2
CO2	3	3	2	-	1	1	1	-	-	-	1	2	2	3	2
CO3	2	2	2	-	-	2	2	-	-	-	2	2	2	2	3
CO4	2	2	2	-	1	2	1	-	-	-	1	1	3	3	3
CO5	3	3	2	-	1	1	2	-	-	-	1	2	3	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Advanced Structural Design(Steel)
Course Code	CEL0723[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					4	1	0	
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	must have the knowledge of steel structure and its component design			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** CO1: Students will revise the concept of Steel Design.**(BL1-Remember)** **CO2-** CO2:Students are able to understand the concept Plate Girders**(BL2-Understand)** **CO3-** CO3:Students are able to apply the knowledge of different types of truss loading**(BL3-Apply)** **CO4-** CO4:To analyze different loadings on Bunkers and Silos**(BL4-Analyze)** **CO5-** CO5: Students will be able to design several complex steel structures**(BL5-Evaluate)** **CO6-** CO6:To complete Design of Water Tank**.**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
1	Design of Plate girder bridges.	lecture with experimental learning, interactive workshops, field trips	
2	Design of truss girder bridges for railways and highway (IRC &IRS holding)	lecture with experimental learning, interactive workshops, field trips	
3	WATER TANKS: Pressed steel tanks, tanks with ordinary plates for different cross section.	lecture with experimental learning, interactive workshops, field trips	
4	Design of Chimneys.	lecture with experimental learning, interactive workshops, field trips	
5	Introduction of HT electric tower, Bunkers and Silos.	lecture with experimental learning, interactive workshops, field trips	

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1`	design of chimney	Experiments	BL2-Understand	3
2	design of water tank	Experiments	BL4-Analyze	3
3	design of plate girder	Experiments	BL4-Analyze	3
4	design of bunker	Experiments	BL4-Analyze	3
5	design of silos	Experiments	BL4-Analyze	3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	20
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Advanced steel design of structure By Chandrasekarn S, crc Press.
Articles	https://www.scribd.com/document/504740284/DR-B-C-Punmia-Steel-Structure
References Books	Advanced steel design By B C Punamia, Laxmi Publication.
MOOC Courses	https://www.youtube.com/watch?v=qJV5zdx7NJs
Videos	https://www.youtube.com/watch?v=qJV5zdx7NJs

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	2	2	2	3	3	1	2	2	3	3	2
CO2	1	2	2	2	2	2	1	2	2	3	1	3	2	3	3
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	1	2	2	3	2	3	-	3	3	3	3	2	3	3	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Introduction to Construction Planning and Management
Course Code	CEL0725[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					03	01	00	
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	Students must have knowledge of the RCC Structure.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will get knowledge different management techniques for construction. **(BL1-Remember)** **CO2-** To understand the resource of contract management**(BL2-Understand)** **CO3-** Students are able to Take the details of contracts & Tenders.**(BL3-Apply)** **CO4-** To adopt knowledge in construction & project management.**(BL4-Analyze)** **CO5-** To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts**(BL5-Evaluate)** **CO6-** To Complete Determination of Organisational behaviour**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents
1	Methods ofconstruction,formworkandcentering.Scheduleofconstruction,joblayout,principlesofconstructionmanagement,modernmanagementtechniqueslikeCP
2	Factors affecting selection, investmentand operating cost, output of various equipments, brief study of equipmentsrequiredforvariousjobssuchasearthwork,dre
3	Contractors & Tenders:- DifferenttypesofContracts&Tenders,noticeinvitingtenders,contractdocument,departmentalmethodofconstruction,rate list, security depc contract,arbitration,administrativeapproval,technicalsanction.
4	Importance, types ofspecifications, specificationsforvarioustradesofengineeringworks. Variousformsusedinconstructionworks,measurementbook,cashbook,ma varioustypesofrunningbills,securedadvance,finalbill.
5	Accommodationofsitestaff, contractor'sstaff,variousorganizationchartsandmanuals,personnelinconstruction,welfarefacilities,labourlawsandhumanrelations,safetyengineering.Problemofe

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	highway module	PBL	BL2-Understand	4
2	bridge module	PBL		3

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	L.S. Srinath, Construction Planning & Management, Laxmi Publication L.S. Srinath, Construction Planning & Management, Laxmi Publication
Articles	https://easyengineering.net/construction-engineering-and-management-by-seetharaman-nw1/
References Books	S.Seetharaman, Introduction to Construction Planning & Management, New Age Publication S.Seetharaman, Introduction to Construction Planning & Management, New Age Publication
MOOC Courses	https://www.youtube.com/playlist?list=PLWnoy5z_3BObBvFtBlowxM05D-q0VAWEs
Videos	https://archive.nptel.ac.in/courses/105/104/105104161/

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	1	2	2	-	1	3	3	1	2	3	3	2
CO2	-	2	2	2	2	-	2	1	1	1	1	1	2	-	2
CO3	1	2	3	2	1	3	2	2	1	1	-	2	-	-	3
CO4	-	2	3	3	2	-	3	2	-	-	1	2	1	2	2
CO5	1	2	2	2	2	3	3	1	1	-	2	1	3	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Railway Engineering
Course Code	CEL0731[T]

Part A

Year	4th	**Semester**	7th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	have the knowledge of basic transportation			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will be able to distinguish different components of Railway Track, different Railway Gauges**(BL1-Remember)** **CO2-** Students will be able to Design track Gradients as per given requirements**(BL4-Analyze)** **CO3-** Students will be able to discuss various Types of Track Turnouts**(BL2-Understand)** **CO4-** Students will be able to describe purposes and facilities at Railway Stations**(BL3-Apply)** **CO5-** Students will be able to Explain Interlocking and modern signal system**(BL3-Apply)** **CO6-** Students will be able to Describe Surface Defects on Railway Track and Their Remedial Measures**(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Sources of water & their estimation, water quality from ground & surface waters, various types of water demand requirement of water for various uses, Population forecasting methods.	lecture with experimental learning, interactive workshops, field trips	8
2	General impurities of water, characteristics of water, impurities present & their significance, water borne diseases control, Analysis of water physical, chemical, bacteriological water standard for different uses intake structure, water conveyance, conduit for transportation, pumps for water riffing- materials, operation & pumping station	lecture with experimental learning, interactive workshops, field trips	8
3	Purification of water supply, treatment methods, design, screening segmentation, coagulation, filtration, disinfection, aeration softening of water, advancement & technologies used in sedimentation, filtration . Miscellaneous treatment methods.	lecture with experimental learning, interactive workshops, field trips	8
4	Distribution systems- layout hydraulics, pipe fittings, values. Appurtenances in distribution system, analysis of distri system & pips network – Hardy cross method, detection of leakage, maintenance, location & height of distribution reservoir , service reservoir capacity	lecture with experimental learning, interactive workshops, field trips	8
5	Rural water supply scheme-System in water supply, financing and management of water supply project, water pollution control act, conservancy & water carriage system, sanitary appliance and their operation.	lecture with experimental learning, interactive workshops, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	The Student Shall Draw The Dimensional Sketches(Along with Brief Note)of Different gauges(as per IRC)	PBL	BL3-Apply	3
2	The Student Shall Draw The Dimensional Sketches(Along with Brief Note)of different rail sections, sleepers, track fittings, points and crossings	PBL	BL2-Understand	3
3	Students may be asked to collect photographs from internet which is related to field application of various topics	Field work	BL3-Apply	

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Railway Engineering by Satish Chandra and M.M. Agrawal Oxford University Press, New Delhi
Articles	https://www.springerprofessional.de/en/journal-of-modern-transportation/16439126
References Books	A Text Book of Railway Engineering by S.C. Saxena and S. P. Arora. Dhanpat Rai & Sons, Delhi
MOOC Courses	https://nptel.ac.in/courses/105107123
Videos	https://www.youtube.com/watch?v=37WMS483T7Y&t=2s https://ia902309.us.archive.org/6/items/eco-8/ECO8.pdf

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	2	2	2	3	3	1	2	2	3	3	1
CO2	1	2	2	2	2	2	1	2	2	3	1	3	2	3	3
CO3	1	1	-	-	-	-	-	-	-	2	3	2	2	1	2
CO4	1	2	2	3	2	3	1	3	3	3	2	2	3	2	1
CO5	1	2	2	3	2	2	1	2	2	1	1	2	2	2	2
CO6	2	3	2	1	1	-	-	-	-	1	2	2	2	2	1

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Major Project
Course Code	CED0804[P]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					0	0	8	8
Course Type	Project							
Course Category	Projects and Internship							
Pre-Requisite/s	Knowledge of Civil engineering and interdisciplinary subjects.			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To enhance writing skills and knowledge.**(BL2-Understand)** **CO2-** To increase their mental ability.**(BL3-Apply)** **CO3-** To inculcate the ability to express innovative opinion and thoughts**(BL4-Analyze)** **CO4-** To have Dissertation works as skills development in students.**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Project/Problem Identification	Project Work	8
2	Project Analysis, Requirement Gathering	Project Work	8
3	Implementation of Project/Solution	Project Work	8
4	Testing and Verification	Project Work	8
5	Presentation and Report Writing	Project Work	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Identification of a problem and formulation of a topic of project/thesis	PBL	BL3-Apply	15 hrs
Module-III	Dissertation and Viva-voci	PBL	BL5-Evaluate	20 hrs

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	50				
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	50	40	20	60	

Part E

Books	
Articles	
References Books	
MOOC Courses	
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	0	0	0	2	1	3	3	3	2	0	2	1	1	2
CO2	2	0	1	0	1	0	2	2	3	2	0	2	2	2	1
CO3	1	1	0	0	1	2	3	3	3	2	0	1	1	1	1
CO4	2	1	1	0	1	1	3	2	2	2	0	2	1	1	2
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Plastic design of steel structure
Course Code	CEE0807[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Learn Introduction and basic hypothesis, Virtual work in the elastic-plastic state**(BL2-Understand)** **CO2-** Learn Method of Limit Analysis, applicable to beams basic theorems of limit analysis, rectangular portal frames, gable frames, grids**(BL4-Analyze)** **CO3-** Learn Limit design Principles, and method of combining**(BL5-Evaluate)** **CO4-** Calculate of Deflection in Plastic beams and frames**.(BL5-Evaluate)** **CO5-** Learn Minimum weight Design**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕	**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)					

Part B

Modules	Contents	Pedagogy	Hours

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Prepare at least one drawing in any CAD software (like AutoCAD) for design of structures conducted in the syllabus	PBL	BL4-Analyze	15
2	Preparation of EXCLE Worksheets for the design of various structural components of Plate Girder/ Gantry Girder/ Foot Over bridge	PBL	BL4-Analyze	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	1. B G Neal, Plastic Methods of Structural analysis-, 3rd edition, Chapman and hall publications, 1977 2. B.C.Punmia, Ashok Kumar Jain, Arun Kumar Jain, -Comprehensive Design of Steel Structures, Laxmi Publications (P) Ltd
Articles	https://www.researchgate.net/publication/359352619_BASICS_AND_CONCEPTS_OF_PLASTIC_DESIGN_OF_STEEL_FRAMES
References Books	1. S K Duggal, -Limit state Design of Steel Structuresl,, McGraw Hill education, 2010 2. MR Shiyekar-Limit State Design of Steel Structuresl, PHI Publication, 3rd Edition
MOOC Courses	https://archive.nptel.ac.in/courses/114/106/114106047/
Videos	https://www.youtube.com/watch?v=qJV5zdx7NJs

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	-	-	-	-	-	-	2	2	3	2	2
CO2	3	3	2	3	-	-	-	-	-	-	2	1	3	1	1
CO3	3	3	2	2	-	-	-	-	-	-	2	2	2	2	2
CO4	3	2	2	2	-	-	-	-	-	-	2	2	3	2	2
CO5	3	2	2	2	-	-	-	-	-	-	1	1	2	2	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Building Environment & Services
Course Code	CEE0808[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will learn the importance of durability of civil engineering structures **(BL2-Understand)** **CO2-** Students will be able to detect the defects in foundation, masonry, plastering, Painting, flooring, doors and windows**(BL3-Apply)** **CO3-** Students will be able to provide preventive and remedial measures for Defects**(BL4-Analyze)** **CO4-** Students will be able to locate and place different components like Lifts, electrical panels etc**.(BL4-Analyze)** **CO5-** Students will learn the importance of Need for retrofitting and restoration **(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Durability of civil engineering structures: – Importance of durability – Factors affecting durability of buildings – life expectancy of different classes of buildings. Environmental factors that affect the durability of structures – Effect of natural agents (Air, sun, rain, frost and biological agents such as vegetation & insects) – Environmental pollution – Effect of pollution of air, water and soil – Location effect (Marine, Industrial area etc.) – Usage aspects (Structures subjected to dynamical loading & abrasive condition) - Preventive and remedial measures. Role of maintenance in durability and serviceability of buildings: – Necessity of maintenance – Economic aspects of maintenance. Different types of maintenance – Preventive maintenance – Remedial maintenance – Routine maintenance – Pre-monsoon maintenance - Special maintenance – Planning aspects of maintenance	Lectures with Presentation, Video Lectures	8
2	Cracks in buildings – Defects in foundation, masonry, plastering, Painting, flooring, doors and windows, concrete (RCC and PCC) and wooden roof - Corrosion of reinforcement and steel structures – structural damage due to fire - Causes – Preventive and remedial measures Cracks in buildings – Causes - Preventive and remedial measures	Lectures with Presentation, Practical visits to detect cracks and defects in a building	8
3	Causes - Preventive and remedial measures for Defects in foundation, masonry wooden roof concrete (RCC and PCC) Corrosion of reinforcement and steel structures flooring doors and Painting Defects due to fire, Stair case, water supply system, sewage and sullage system, in drainage system and electrical system Building Services Introduction to other building services	Lectures with Presentation, Practical visits to detect cracks and defects in a building	8
4	Lift – Location – RTT – Number of lifts – lift well and shaft – Machine room. Air conditioning system: Types of A/C – Capacity determination – Requirements for an A/C room. Electrical installations: Panel board & Buss bar, rising mains – distribution boards – MCB – ELCB – DP - TP and change over switch switches - Telephone and TV connectivity – Requirements of domestic gas pipeline	Lectures with Presentation, Case Study on different lift locations	8
5	Retrofitting and restoration of building – Need for retrofitting and restoration – Common retrofitting works carried out – Shoring and underpinning – Different methods of retrofitting and restoration – Challenges in retrofitting and restoration works. Deterioration of monumental and historical buildings – Common causes – Preventive measures – Restoration works – Conservation of world heritages	Lectures with Presentation, Practical visits to provide solutions for cracks and defects in a building	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Plan and draw in detail ventilation and air-conditioning for a given building	PBL	BL3-Apply	15
2	Plan movement facilities: Lifts, escalators, ramps etc. for a given public building	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	S. Champion :Failures and repair of concrete structures ; John Wiley & Sons
Articles	Philip.H.Perkins: Concrete Structures-repair water proofing and protection; Elsevier Science Ltd
References Books	B.S.Nayak : A book on Maintenance Engineering ; Khanna Publishers
MOOC Courses	https://nptel.ac.in/courses/105107156
Videos	https://www.youtube.com/watch?v=9hfKdUGWQjQ&t=2s

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	1	1	2	-	-	-	2	2	2	3	3
CO2	3	2	3	2	1	1	2	-	-	-	2	2	2	2	2
CO3	3	2	3	2	-	-	1	-	-	-	2	2	2	3	3
CO4	3	3	3	1	1	-	2	-	-	-	1	2	2	2	2
CO5	3	3	2	2	1	1	2	-	-	-	2	2	2	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Design of Pre stressed Concrete Structure
Course Code	CEE0809[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					4	1	0	5
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s	basic properties of materials, and steel and Rcc design			**Co-Requisite/s**	basic knowledge of structures			
Course Outcomes & Bloom's Level	**CO1-** Students will remember the WSM Method for RCC and Pre-stressed Structures.**(BL1-Remember)** **CO2-** To understand different types and Methods of Pre-stressing.**(BL2-Understand)** **CO3-** Students will be able to apply the knowledge of Pre-stressing on different RCC Structures.**(BL3-Apply)** **CO4-** To analyze Beam for different Profiles of Tendons.**(BL4-Analyze)** **CO5-** To evaluate the stress distribution for different zones of beams**(BL5-Evaluate)** **CO6-** To Create and design a Pre-stressed beam and understand its advantages over RCC**(BL6-Create)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Introduction, Principles of prestressing, Different methods of prestressing – post tensioning and pre-tensioning. Prestressed concrete materials. Need for high strength concrete and High concrete tensile steel. Creep and shrinkage of concrete, relaxation of steel. Losses of prestress friction and anchorage of steel	Lectures with problem based learning, experimental learning, case study, field trips	10
unit II	Introduction , assumption in plastic analysis Safe moment ,yield moment , plastic moment, shape factor, load factor, moment curvature relationship , collapse load for standard cases, plastic hing length	Lectures with problem based learning, experimental learning, case study, field trips	9
unit III	Stress-pattern in anchorage zones. Transmission length. End zone reinforcement. Stress distribution in end block	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Plastic design of columns for different condition	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Design of R.C.C structures concepts (W.S.M)	Lectures with problem based learning, experimental learning, case study, field trips	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	making model of prestressed beam	PBL	BL4-Analyze	3
II	making a model of prestressed slabs	PBL	BL5-Evaluate	2
III	making of model of prestressed coloums	PBL	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
0	0	0	0	0	0

Part E

Books	Prestress concrete by S S Ramamrutham
Articles	https://railtec.illinois.edu/wp/wp-content/uploads/Nawy-2009-Prestressed-Concrete.pdf
References Books	Prestress concrete by Krishna Raju
MOOC Courses	https://archive.nptel.ac.in/courses/105/106/105106118/
Videos	https://easyengineering.net/design-of-reinforced-concrete-structures-by-ramamrutham/

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	2	3	1	1	2	-	-	-	-	1	1	-
CO2	1	2	1	1	1	-	2	1	-	1	-	-	1	2	-
CO3	2	1	3	1	-	1	-	1	-	-	-	1	-	-	-
CO4	1	1	1	-	1	-	1	-	-	1	-	2	-	1	-
CO5	1	2	1	-	1	-	1	-	-	-	-	1	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Traffic Engineering
Course Code	CEE0810[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					4	2	0	
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s	basic knowledge of traffic and highway engineering			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in traffic engineering**.(BL1-Remember)** **CO2-** To understand & analyze the traffic engineering problems**(BL2-Understand)** **CO3-** To implement car-following models, queuing theories, and design of traffic signals in traffic engineering**.(BL3-Apply)** **CO4-** To provide experimental basis, and to enable the students to suggest the car-following theory and traffic control measures that will best suit the Indian traffic condition**.(BL4-Analyze)** **CO5-** To evaluate the vehicle, highway and traffic factors that influences the movement of vehicles and design of traffic control measures**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Introduction: Role of traffic Engineer, Vehicle, highway and traffic factors**.** Traffic characteristics, Vehicular Road users, Introduction to Traffic Noise and Air Pollution and remedial measures**.**	Lectures with problem based learning, experimental learning, case study, field trips	10
unit II	Traffic flow: Interrupted and Uninterrupted Traffic Flow, Highway capacity: Urban, rural and intersection, Capacity of transit system, Traffic flow theory: Car Following and Queuing Theory**.**	Lectures with problem based learning, experimental learning, case study, field trips	9
unit III	Traffic Studies: Traffic volume studies, speeds studies, Speed and Delay Studies, Origin and Destination studies, Accident studies, capacity studies, parking studies**.**	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Traffic Control: regulations and other operational controls, Traffic Signal and marking, street lighting, Traffic Safety: Barricades, delineators**.**	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Design of Intersections: Channelizing islands, Design of Rotaries, Intersection and terminal Design, Parking facilities**.**	Lectures with problem based learning, experimental learning, case study, field trips	9

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
I	model of traffic light	PBL	BL2-Understand	3
II	drawing of pavment marking	Experiments	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100		40	12	60	18
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
	0				

Part E

Books	Principles of Transportation engineering by CEG Justo & S K Khanna
Articles	https://archive.nptel.ac.in/courses/105/101/105101008/
References Books	Highway Engineering By L R Kadiyali Khanna publication House
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105215/
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	2	2	1	-	2	1	-	-	-	1	1	-
CO2	1	2	1	2	1	-	1	1	1	-	-	-	-	-	-
CO3	2	1	2	1	-	-	1	2	3	-	-	-	2	1	-
CO4	1	1	1	2	1	-	1	1	-	-	-	-	-	-	-
CO5	2	2	1	-	1	1	1	1	-	-	-	-	1	1	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Energy Efficient and Green Building
Course Code	CEE0811[T}

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Understand the concept of Green Buildings**(BL2-Understand)** **CO2-** Analyze & compute the energy flow in buildings**(BL4-Analyze)** **CO3-** Understand the energy efficient buildings**(BL2-Understand)** **CO4-** Design the building as per LEED India Rating System**(BL4-Analyze)** **CO5-** Design an Eco-friendly captive power generation**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	What is Green Building, Why to go for Green Building, Benefits of Green Buildings, Green Building Materials and Equipment in India, What are key Requisites for Constructing a Green Building, Important Sustainable features for Green Building	Lectures with Presentation and Seminar	8
2	Indian Green Building Council, Green Building Moment in India, Benefits Experienced in Green Buildings, Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Green Building Opportunities And Benefits: Opportunities of Green Building, Green Building Features, Material and Resources, Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings, LEED India Rating System and Energy Efficiency	Lectures with Microsoft Presentation, Poster Presentations and Interactive Video Lectures	8
3	Introduction, Reduction in Energy Demand, Onsite Sources and Sinks, Maximise System Efficiency, Steps to Reduce Energy Demand and Use Onsite Sources and Sinks, Use of Renewable Energy Sources. Ecofriendly captive power generation for factory, Building requirement	Lectures with Microsoft Presentation, Poster Presentations and Interactive Video Lectures	8
4	Introduction, CII Godrej Green business centre,Design philosophy,Design interventions,Energy modeling, HVAC System design,Chiller selection,pump selection,Selection of cooling towers,Selection of air handing units,Precooling of fresh air,Interior lighting system,Key feature of the building. Eco-friendly captive power generation for factory,Building requirement	Lectures with Microsoft Presentation, Poster Presentations and Interactive Video Lectures	8
5	Handling of non process waste, waste reduction during construction,materials with recycled content,local materials,material reuse,certified wood ,Rapidly renewable building materials and furniture; Indoor Environment Quality And Occupational Health: Air conditioning, Indore air quality, Sick building syndrome, Tobacco smoke control, Minimum fresh air requirements avoid use of asbestos in the building, improved fresh air ventilation, Measure of IAQ, Reasons for poor IAQ, Measures to achieve Acceptable IAQ levels	Lectures with Microsoft Presentation, Poster Presentations and Interactive Video Lectures	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Eco-friendly captive power generation for ITM University any block	PBL	BL4-Analyze	20
2	Preparing Models of Green Buildings	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Handbook on Green Practices published by Indian Society of Heating Refrigerating and Air conditioning Engineers, 2009
Articles	https://www.researchgate.net/publication/322273339_Energy_Consumption_and_Efficiency_in_Green_Buildings#:~:text=The%20study%20consummates
References Books	Green Building Hand Book by Tomwoolley and Samkimings, 2009
MOOC Courses	https://archive.nptel.ac.in/courses/105/102/105102195/
Videos	https://www.youtube.com/watch?v=LdHMjhaBWxw

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	2	-	-	-	1	2	2	2	3
CO2	3	2	3	1	1	1	2	-	-	-	1	2	2	3	2
CO3	3	2	3	1	1	1	3	-	-	-	2	2	2	2	3
CO4	3	3	3	2	-	1	2	-	-	-	1	2	3	3	3
CO5	3	2	3	1	-	1	3	-	-	-	1	2	3	2	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Airport Engineering
Course Code	CEE0812[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Describe the different components of airport and aircrafts**(BL2-Understand)** **CO2-** Analyse the requirements of an airport layout with respect to international regulations**(BL4-Analyze)** **CO3-** Explain the airport runway design**(BL4-Analyze)** **CO4-** Design Taxiways & Aprons**.(BL3-Apply)** **CO5-** Summarise the concepts of the terminal service facilities**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	AIR TRANSPORTATION Airport terminology, component parts of Aeroplane, Classification and size of airports; Aircraft characteristics**.** Air traffic control need for ATC, Air traffic control network, Air traffic control aids –enroute aids, landing aids**.** Airport site location and necessary surveys for site section, airport obstructions**.**	Lectures with Presentation, Site Visit to Airport	8
2	PLANNING: Airport master plan –FAA recommendations, Regional Planning, ICAO recommendations, Estimation of future airport traffic needs-layout of Air Port	Lectures with Presentation, Site Visit to Airport	8
3	RUNWAYS: Runway orientation – windrose diagram, basic runway length, corrections for elevation, temperature and gradient, runway geometric design, runway pavement design introduction	Lectures with Presentation, Site Visit to Airport	8
4	TAXIWAYS AND APRONS: Loading aprons –holding aprons – Geometric design standards, exit taxiways –optimal location, design, and fillet and separation clearance	Lectures with Presentation, Site Visit to Airport	8
5	OTHER FACILITIES: Lighting, visual airport marking, airport lighting aids**.** OPERATIONS AND SCHEDULING: Ground transportation facilities; Airport capacity, runway capacity and delays**.**	Lectures with Presentation, Site Visit to Airport	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Project On Airport Planning and Design	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Khanna S.K., Arora M.G., Jain S.S., "Airport Planning & Design",1st Edition, Nemch and Bros. Roorkee, 2009
Articles	https://www.researchgate.net/publication/228007533_Airport_Engineering_Planning_Design_and_Development_of_21st_Century_Airports_Fourth_
References Books	Robert Horonjeff, Francis Mc Kelvey, William Sproule and Seth Young, "Planning and Design of Airports" 5th Edition, 2010
MOOC Courses	https://archive.nptel.ac.in/courses/105/107/105107123/
Videos	https://www.youtube.com/watch?v=WUq3uN4MDms

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	2	-	-	-	-	-	-	2	2	3	3	2
CO2	3	2	3	1	-	-	-	-	-	-	3	2	2	2	3
CO3	3	2	2	1	-	-	-	-	-	-	2	2	3	2	2
CO4	2	2	1	1	-	-	-	-	-	-	2	2	2	2	3
CO5	2	2	3	-	-	-	-	-	-	-	2	3	2	3	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Solid Waste Management
Course Code	CEE0813[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will Understand the concept of solid waste management**(BL2-Understand)** **CO2-** Students will be able to explain handling and processing of solid waste**(BL2-Understand)** **CO3-** Students will be able to apply the concept of landfilling for disposal of solid waste**(BL3-Apply)** **CO4-** Students will be able to design composting and other solid waste conversion units**(BL4-Analyze)** **CO5-** Students will understand the various hazardous waste, risk assessment and legislation **(BL2-Understand)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG6(Clean water and sanitation) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Solid waste: Public health and ecological impacts, Sources and types of solid wastes, material flow and waste generation, Functional elements: Waste generation, storage, collection, Transfer and transport, processing and recovery, disposal. Physical and chemical composition of municipal solid waste, integrated solid waste management, hierarchy of waste management options, different methods for generation rates. Storage: movable bins, fixed bins. Collection: home to home collection, community bin system. Theory and design of hauled container system, stationary container system	Lectures with problem based learning, experimental learning, case study, field trips	8
2	Transportation: handcart, tri-cycle, animal cart, tripper truck, dumper placer, bulk refuse carrier, railroad transport, water transport, conveyors, layout of routes. Engineering system for on-site handling and processing of solid waste: separators, size reduction equipments, screening equipments, densification, baling, cubing, pelleting equipments	Lectures with problem based learning, experimental learning, case study, field trips	8
3	Land filling: Site selection criteria, landfill layout, landfill sections, Occurrence of gases and leachate in landfills: composition and characteristics, generation factors, initial adjustment phase, transition phase, acid formation phase, methane formation phase, maturation phase of gases and leachate, Introduction to engineered landfills	Lectures with problem based learning, experimental learning, case study, field trips	8
4	Composting, types of composting, process description, design and operational consideration of aerobic composting, process description, design and operational consideration of anaerobic composting. Thermal conversion technologies: incineration and pyrolysis system, energy recovery, system. Overview of solid waste management practices in India	Lectures with problem based learning, experimental learning, case study, field trips	8
5	Introduction to Hazardous wastes, Definition of Hazardous waste, The magnitude of the problem; Hazardous waste: Risk assessment, Environmental legislation, Characterization and site assessment, Waste minimization and resource recovery, Transportation of hazardous waste, Disposal of hazardous waste. Introduction to Electronic waste and Biomedical waste and their disposal	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
Module-I	Comparative study of different filters for water purification	PBL	BL3-Apply	15
Module-II	Project on collection and composting of waste	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Tchobanoglous, G., Theisen, H., & Vigil, S.A; Integrated Solid Waste Management: McGraw Hill,New York
Articles	https://investmeghalaya.gov.in/resources/homePage/17/megeodb/rules/Solid_Waste_Management_Rules.pdf
References Books	Solid Waste Engineering, Principle & Management issues by Ven Te Chow
MOOC Courses	https://archive.nptel.ac.in/courses/105/103/105103205/
Videos	https://www.youtube.com/watch?v=cjIacnNRLHE

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	2	-	1	2	-	-	-	1	1	2	2	3
CO2	2	1	1	1	-	1	2	-	-	-	1	1	2	3	2
CO3	2	2	2	1	-	2	2	-	-	-	1	2	2	2	2
CO4	3	3	1	1	-	1	1	-	-	-	1	1	2	2	1
CO5	2	2	1	2	-	2	2	-	-	-	1	2	2	2	3
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Urban Transportation Planning
Course Code	CEE0814[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Electives							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will be able to Understand the basic concepts of planning at urban and regional levels**(BL2-Understand)** **CO2-** Students will be able to Distinguish between the Conventional and current approaches for travel demand estimation**(BL4-Analyze)** **CO3-** Students will be able to Implement various types of models and trip generation**(BL3-Apply)** **CO4-** Students will be able to Analyze the urban travel markets**(BL4-Analyze)** **CO5-** Students will be able to Evaluate the transport planning proposals**(BL5-Evaluate)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG8(Decent work and economic growth) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction to transportation planning, planning concept, Goals, objectives, and Importance of transportation planning. Nature of traffic problems in cities. Present Scenario of road transport and rail transport assets. Role of transportation: Social, Political, Environmental. Transport and Socioeconomic Activities, Historical Development of Transport, Transportation in the Cities, Freight Transportation, Future Developments.	Lectures with problem based learning, experimental learning, case study, field trips	8
2	Urban form and Transport patterns, land use – transport cycle, concept of accessibility. Types of transport systems, evolution of transport modes, transport problems and mobility issues. Public Transport: Intermediate Public Transport (IPT) Rapid and mass transport system like MRTS & bus rapid transit. Transport Planning Process, Problem Definition, Solution Generation	Lectures with problem based learning, experimental learning, case study, field trips	8
3	Travel demand: Estimation and fore casting, trip classification, trip generation: factor and methods, multiple regression analysis. Trip distribution methods, modal split, trip assignment	Lectures with problem based learning, experimental learning, case study, field trips	8
4	Studying travel behavior. Analyzing urban travel markets. Traffic and transportation surveys and studies, traffic and travel characteristics, urban transport planning process – stages, study area, zoning, database	Lectures with problem based learning, experimental learning, case study, field trips	8
5	Evaluation of transport planning proposals: Land Use Transport Planning, Economic Evaluation methods like Net present Value methods, and Benefit Cost method. Transport system management: Long-term and short-term planning	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	Traffic Survey of National Highways	PBL	BL4-Analyze	15
2	Parking Planning for given vehicles	PBL	BL4-Analyze	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**

Part E

Books	Metropolitan Transportation planning-J.W. Dickey
Articles	https://www.tandfonline.com/journals/rupt20
References Books	Hutchinson, B.G.(1974).Principles of Urban Transport Systems Planning. Mc Graw Hill Book Company, New York
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105208/
Videos	https://www.youtube.com/watch?v=pW-Qymxabsc

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	1	-	-	-	-	2	2	2	2	3
CO2	2	2	2	3	2	1	-	-	-	-	2	1	2	1	2
CO3	3	2	2	2	2	1	-	-	-	-	2	2	2	1	1
CO4	3	2	2	3	1	1	-	-	-	-	1	1	2	2	2
CO5	2	3	2	2	1	1	-	-	-	-	2	2	1	1	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Design of Hydraulic Structures
Course Code	CEL0827[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s	Basics of Structural Design and Analysis			**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** To remember the various concepts in theory of Dams**(BL1-Remember)** **CO2-** To understand & analyze the different Hydraulic strutures**(BL2-Understand)** **CO3-** To implement the different designing concepts of Spillways**(BL3-Apply)** **CO4-** To provide experimental basis, and to enable the students to analyze the design of gravity dams**(BL4-Analyze)** **CO5-** To evaluate the applications of different Energy dissipators in various fields such as research & industries**(BL5-Evaluate)** **CO6-** To apply the understanding of Hydel power plant in solving problem of electricity**(BL3-Apply)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✕ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Gravity dams: Design Criteria, forces acting on gravity dams, elementary profile, low and high gravity dams, stability analysis, evaluation of profile by method of zoning, practical profile, foundation treatment, construction joints, galleries in gravity dams.	Lectures with problem based learning, experimental learning, case study, field trips	8
2	Earth and Rock fill dams : Earth Dams: Types, causes of failure and design criteria, soils suitable for earth dam construction, construction methods, foundation requirements, typical earth dam sections, estimation of seepage through and below the dam, seepage control, stability of slopes by slip circle method of analysis, pore pressures, sudden draw down, steady seepage and construction pore pressure condition. Rock fill dams: Types, merits and demerits, conditions favourable for their adoption.	Lectures with problem based learning, experimental learning, case study, field trips	10
3	Spillways : Ogee spillway and its design, details of syphon, shaft, chute and side channel spillways, emergency spillways.	Lectures with problem based learning, experimental learning, case study, field trips	8
4	Energy dissipatiors and gates : Principles of energy dissipation Energy dissipators based on tail water rating curve and jump height curves Spillway crest gates - vertical lift and radial gates, their design principles and details. Design of canal regulating structures, Detaild design of Sarda Falls, design of cross drainage works, sphypon aquaduct	Lectures with problem based learning, experimental learning, case study, field trips	10
5	Hydropower Plants: Introduction of Hydropower development, assessment of power potential, types of hydropower plants, general features of hydro-electric schemes, selection of turbines, draft tubes, surge tanks, penstocks, power house dimensions, development of micro hydel stations, tidal plants, pumped storage plants and their details.	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To find the coefficient of ogee weir	Experiments	BL3-Apply	2
2	To study flow characteristics and pressure distribution over ogee weir	Experiments	BL3-Apply	2
3	To study the effect of hydraulic jump for dissipation of energy of a spillway	Experiments	BL4-Analyze	2
4	Study of different energy dissipators and their efficiencies	Experiments	BL5-Evaluate	2
5	To study the flow characteristics through a siphon spillway	Experiments	BL4-Analyze	2

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluatic**
100	40	40	12	60	
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	0	40	20	60	

Part E

Books	SK Garg, Irrigation engg and Hydraulic structures, Khanna publications
Articles	https://www.freebookcentre.net/civil-books-download/Design-Of-Hydraulic-Structures.html
References Books	SK Sharma, Irrigation engg and Hydraulic structures, Schand
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105203/ https://www.youtube.com/watch?v=z9wsUWaN-oY
Videos	

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	1	-	2	2	2	1
CO2	3	3	2	2	1	-	-	-	-	1	-	2	2	-	2
CO3	3	-	-	-	-	-	-	-	-	1	-	2	2	2	-
CO4	3	3	2	2	1	-	-	-	-	1	-	2	2	1	1
CO5	2	1	-	1	-	-	-	-	-	1	-	2	2	1	1
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2023-2024

(SOET)(BTech-CivilEngineering)

Title of the Course	Retrofitting and rehabilitation of structures
Course Code	CEL0831[T]

Part A

Year	4th	**Semester**	8th	**Credits**	L	T	P	C
					3	1	0	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**CO1-** Students will be able to learn various distress and damages to concrete and masonry structures**(BL1-Remember)** **CO2-** To understand the importance of maintenance of structures**(BL2-Understand)** **CO3-** To study the various types and properties of repair materials**(BL2-Understand)** **CO4-** To asses the damage to structures using various tests **(BL4-Analyze)** **CO5-** To learn the importance and methods of substrate preparation **CO6-** To learn various repair techniques of damaged structures, corroded structures							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professsonal Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction Maintenance, rehabilitation, repair, retrofit and strengthening, need for rehabilitation of structures. Cracks in R.C. buildings Various cracks in R.C. buildings, causes and effects Maintenance Maintenance importance of maintenance, routine and preventive maintenance. Damages to masonry structures Various damages to masonry structures and causes	Lectures with problem based learning, experimental learning, case study, field trips	10
2	Repair materials Various repair materials, Criteria for material selection, Methodology of selection, Health and safety precautions for handling and applications of repair materials Special mortars and concretes Polymer Concrete and Mortar, Quick setting compounds Grouting materials Gas forming grouts, Salfoalumate grouts, Polymer grouts, Acrylate and Urethane grouts. Bonding agents Latex emulsions, Epoxy bonding agents. Protective coatings Protective coatings for Concrete and Steel FRP sheets	Lectures with problem based learning, experimental learning, case study, field trips	10
3	Damage diagnosis and assessment Visual inspection, Non Destructive Testing using Rebound hammer, Ultra sonic pulse velocity, Semi destructive testing, Probe test, Pull out test, Chloride penetration test, Carbonation, Carbonation depth testing, Corrosion activity measurement Substrate preparation Importance of substrate/surface preparation, General surface preparation methods and procedure, Reinforcing steel cleaning	Lectures with problem based learning, experimental learning, case study, field trips	10
4	Crack repair Various methods of crack repair, Grouting, Routing and sealing, Stitching, Dry packing, Autogenous healing, Overlays, Repair to active cracks, Repair to dormant cracks. Corrosion of embedded steel in concrete Corrosion of embedded steel in concrete, Mechanism, Stages of corrosion damage, Repair of various corrosion damaged of structural elements (slab, beam and columns)	Lectures with problem based learning, experimental learning, case study, field trips	8
5	Jacketing Jacketing, Column jacketing, Beam jacketing, Beam Column joint jacketing, Reinforced concrete jacketing, Steel jacketing, FRP jacketing. Strengthening Strengthening, Beam shear strengthening, Flexural strengthening	Lectures with problem based learning, experimental learning, case study, field trips	8

Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To Assess the maintenance of Buildings	PBL	BL4-Analyze	15
2	To diagnose the best technique for failiure of different components of concrete masonary structures	PBL	BL3-Apply	15

Part D(Marks Distribution)

Theory					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluation**
100	40	40	12	60	0
Practical					
Total Marks	**Minimum Passing Marks**	**External Evaluation**	**Min. External Evaluation**	**Internal Evaluation**	**Min. Internal Evaluatio**
100	0	40	20	60	

Part E

Books	1. Repair and protection of concrete structures by Noel P.Mailvaganam, CRC Press,1991. 2. Concrete repair and maintenance Illustrated by Peter.H.Emmons, Galgotia publications Pvt. Ltd., 2001. 3. “Earthquake resistant design of structures” by Pankaj agarwal, Manish shrikande, PHI, 2006.
Articles	https://www.researchgate.net/publication/344775584_Modern_Techniques_for_the_Restoration_and_Rehabilitation_of_Concrete_Structures
References Books	1. Failures and repair of concrete structures by S.Champion, John Wiley and Sons, 1961. 2. Diagnosis and treatment of structures in distress by R.N.Raikar Published by R & D Centre of Structural Designers and Consultants Pvt.Ltd, Mumbai. 3. Handbook on repair and rehabilitation of RCC buildings, CPWD, Government of India. 4. Handbook on seismic retrofit of buildings, A. Chakrabarti et.al., Narosa Publishing House, 2010
MOOC Courses	https://archive.nptel.ac.in/courses/105/105/105105213/
Videos	https://www.youtube.com/watch?v=widz1C17omE&embeds_referring_euri=https%3A%2F%2Farchive.nptel.ac.in%2F&source_ve_path=OTY3MTQ&feature=emb_imp_woyt

Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	2	2	-	-	3	3	-	-	3	-	2
CO2	2	-	2	2	1	2	-	-	3	3	-	-	3	2	2
CO3	-	-	2	1	1	-	-	-	2	1	-	-	3	2	2
CO4	-	1	2	3	1	-	-	-	-	-	-	-	3	-	2
CO5	-	1	1	2	1	-	-	-	-	-	-	-	3	-	2
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-