

## Syllabus-2020-2021

### (SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Structural Materials
<b>Course Code</b>	CEL0233[T]

#### Part A

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

#### 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

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

### 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-2020-2021

(SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Essentials of IT						
<b>Course Code</b>	CSL0201[T]						
<b>Part A</b>							
<b>Year</b>	1st	<b>Semester</b>	2nd	<b>Credits</b>	L	T	P
					2	0	2
							4
<b>Course Type</b>	Embedded theory and lab						
<b>Course Category</b>	Foundation core						
<b>Pre-Requisite/s</b>	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.			<b>Co-Requisite/s</b>			
<b>Course Outcomes &amp; Bloom's Level</b>	<p><b>CO1-</b> Understand the basics of Computer systems like types, I/O devices, storage of computer systems (Knowledge, Understand)(<b>BL1-Remember</b>)</p> <p><b>CO2-</b> Apply the various networking concepts, topologies and remove deadlocks. (Apply). (<b>BL2-Understand</b>)</p> <p><b>CO3-</b> Explain various memory management techniques and Analyze the concept of Sub-programs and blocks (Analysis)(<b>BL3-Apply</b>)</p> <p><b>CO4-</b> Design the concept of software, operating system for better utilization of external system (Design)(<b>BL4-Analyze</b>)</p> <p><b>CO5-</b> Evaluating the various algorithm, its solution and other communication techniques. (Investigation).( <b>BL5-Evaluate</b>)</p>						
<b>Courses Elements</b>	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		<b>SDG (Goals)</b>	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

<b>Books</b>	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.
<b>Articles</b>	
<b>References Books</b>	E. Balagurusamy; Programming in ANSI C; Tata McGraw-Hill Publishing. Ron Mansfield; Working in MS-Office; Tata McGraw Hill Publishing.
<b>MOOC Courses</b>	
<b>Videos</b>	

### 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-2020-2021

(SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Principles of Electrical Engineering							
<b>Course Code</b>	EEL0201[T]							
Part A								
<b>Year</b>	1st	<b>Semester</b>	2nd	<b>Credits</b>	L	T	P	
					3	1	2	6
<b>Course Type</b>	Embedded theory and lab							
<b>Course Category</b>	Disciplinary Minor							
<b>Pre-Requisite/s</b>				<b>Co-Requisite/s</b>				
<b>Course Outcomes &amp; Bloom's Level</b>	<p><b>CO1-</b> Predict the behavior of any electrical circuits, Formulate and solve complex DC circuits. <b>(BL1-Remember)</b></p> <p><b>CO2-</b> Predict the behavior of any electrical circuits, Formulate and solve complex single phase AC circuits. <b>(BL2-Understand)</b></p> <p><b>CO3-</b> Predict the behavior of any electrical circuits, Formulate and solve complex Three phase AC circuits. <b>(BL3-Apply)</b></p> <p><b>CO4-</b> 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. <b>(BL4-Analyze)</b></p> <p><b>CO5-</b> Predict the behavior of various measuring instruments in electrical engineering <b>(BL5-Evaluate)</b></p>							
<b>Coures Elements</b>	Skill Development ✓ Entrepreneurship ✗ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		<b>SDG (Goals)</b>					



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.	Talks and presentations	12
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.	Talks and presentations	11
3	Electrical Measuring Instruments:- Introduction and classification of Electrical Instruments, Essentials of indicating instruments, Moving iron instruments, Types of moving iron instruments, Advantages and Disadvantages of moving iron instruments, Applications of moving iron equipment, Permanent Magnet type moving coil instruments, extension of range of ammeters and voltmeter, Dynamometer type instruments, Dynamometer type wattmeters	Talks and presentations	13
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..	Talks and presentations	11
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	Talks and presentations	13

### Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
1	To verify Kirchoff's current law and voltage law	Experiments	BL2-Understand	2
1	To verify superposition theorem	Experiments	BL3-Apply	2
2	Measurement Of Active & Reactive power in Single Phase AC circuit and three phase ac circuit	Experiments	BL2-Understand	2
2	Measurement of Impedance of R-L, R-C, R-L-C & study of resonance phenomena	Experiments	BL2-Understand	2
2	Measurement Of Power & Power factor in a Single Phase AC Circuit using Three Ammeter Method	Experiments	BL3-Apply	2
4	Measurement of line quantities and phase quantities in a three phase ac circuit	Experiments	BL4-Analyze	2
5	Study of transformer name plate rating and determination of its transformation ratio	Experiments		2
5	To perform load test on a single-phase transformer	Experiments	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	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

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

### 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	1	1	2
CO2	1	1	2	1	1	1	-	1	-	-	1	1	2	3	1
CO3	2	1	2	1	2	-	1	-	-	-	1	1	1	2	2
CO4	1	1	1	2	1	-	-	-	-	-	1	1	3	1	3
CO5	1	1	1	2	1	-	-	-	-	-	1	-	2	2	1
CO6	1	1	1	1	1	-	-	-	-	-	1	1	1	3	2



## Syllabus-2020-2021

(SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Environmental Science and Pollution Control							
<b>Course Code</b>	ESL0201[T]							
<b>Part A</b>								
<b>Year</b>	1st	<b>Semester</b>	2nd	<b>Credits</b>	L	T	P	C
					3	1	0	4
<b>Course Type</b>	Theory only							
<b>Course Category</b>	Foundation core							
<b>Pre-Requisite/s</b>	Basic knowledge of natural resources, biodiversity, ecological succession, energy flow, environmental issues and problems.			<b>Co-Requisite/s</b>	A detailed understanding of the complexity of environment and its challenges and solutions to these problems and challenges.			
<b>Course Outcomes &amp; Bloom's Level</b>	<p><b>CO1-</b> CO1. Develop environmental scientists and engineers and sensitize them towards environmental issues.(<b>BL2-Understand</b>)</p> <p><b>CO2-</b> CO2. To acquire analytical skills in assessing environmental impacts through a multidisciplinary approach(<b>BL3-Apply</b>)</p> <p><b>CO3-</b> CO3. Ability to distinguish between various methods of various pollution analysis(<b>BL4-Analyze</b>)</p> <p><b>CO4-</b> 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.(<b>BL5-Evaluate</b>)</p> <p><b>CO5-</b> CO5. Students acquire skills for to communicate, prepare, plan and implement the environmental management project(<b>BL6-Create</b>)</p>							
<b>Courses Elements</b>	Skill Development ✗ Entrepreneurship ✗ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✓ Environment ✓		<b>SDG (Goals)</b>	SDG5(Gender equality) SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG12(Responsible consumption and production) SDG13(Climate action) SDG15(Life on land)				

Part B

Modules	Contents	Pedagogy	Hours
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
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
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
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



## Syllabus-2020-2021

(SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Statistics for Engineers							
<b>Course Code</b>	MAL0203[T]							
<b>Part A</b>								
<b>Year</b>	1st	<b>Semester</b>	2nd	<b>Credits</b>	L	T	P	C
					2	1	2	5
<b>Course Type</b>	Embedded theory and lab							
<b>Course Category</b>	Discipline Core							
<b>Pre-Requisite/s</b>	<p>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.</p>			<b>Co-Requisite/s</b>	<p>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.</p>			
<b>Course Outcomes &amp; Bloom's Level</b>	<p><b>CO1-</b> To remember basic concept of about the design data collection plans and basic tools of descriptive statistics. <b>(BL1-Remember)</b></p> <p><b>CO2-</b> 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. <b>(BL2-Understand)</b></p> <p><b>CO3-</b> To apply the test and make hypothesis by Student's t-test, F-test, chi-square test, Z test, goodness of fit. <b>(BL3-Apply)</b></p> <p><b>CO4-</b> To analyze the concept of sampling distribution of a statistic and its properties, difference between parameter and statistic. <b>(BL4-Analyze)</b></p> <p><b>CO5-</b> To evaluate and describe the properties of unbiasedness. Also identifying and provide an application the null hypothesis, alternative hypothesis and test statistic. <b>(BL5-Evaluate)</b></p>							
<b>Coures Elements</b>	Skill Development ✓ Entrepreneurship ✗ Employability ✗ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		<b>SDG (Goals)</b>	SDG4(Quality education)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction 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



## Syllabus-2020-2021

(SOET)(BTech-CivilEngineering)

<b>Title of the Course</b>	Engineering Graphics							
<b>Course Code</b>	MEL0202[T]							
Part A								
<b>Year</b>	1st	<b>Semester</b>	2nd	<b>Credits</b>	L	T	P	
					2	1	1	4
<b>Course Type</b>	Embedded theory and lab							
<b>Course Category</b>	Discipline Core							
<b>Pre-Requisite/s</b>	Basic knowledge of geometrical construction, sketching, imagination etc.			<b>Co-Requisite/s</b>				
<b>Course Outcomes &amp; Bloom's Level</b>	<p><b>CO1-</b> To get the fundamentals of engineering graphics, geometrical construction and its applications. <b>(BL1-Remember)</b></p> <p><b>CO2-</b> To understand the basic concept of engineering graphics through real-life examples. <b>(BL2-Understand)</b></p> <p><b>CO3-</b> To implement the different engineering graphics concepts over appropriate drawing dataset. <b>(BL3-Apply)</b></p> <p><b>CO4-</b> To analyze the drawing performance of engineering graphics techniques. <b>(BL4-Analyze)</b></p> <p><b>CO5-</b> To evaluate the drawing performance of engineering graphics techniques on a corresponding object. <b>(BL5-Evaluate)</b></p>							
<b>Coures Elements</b>	Skill Development ✓ Entrepreneurship ✗ Employability ✗ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		<b>SDG (Goals)</b>	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, Involute 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**

<b>Modules</b>	<b>Title</b>	<b>Indicative-ABCA/PBL/ Experiments/Field work/ Internships</b>	<b>Bloom's Level</b>	<b>Hours</b>
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)**

<b>Theory</b>					
<b>Total Marks</b>	<b>Minimum Passing Marks</b>	<b>External Evaluation</b>	<b>Min. External Evaluation</b>	<b>Internal Evaluation</b>	<b>Min. Internal Evaluation</b>
100	40	40	12	60	
<b>Practical</b>					
<b>Total Marks</b>	<b>Minimum Passing Marks</b>	<b>External Evaluation</b>	<b>Min. External Evaluation</b>	<b>Internal Evaluation</b>	<b>Min. Internal Evaluation</b>
100	50	40	20	60	



