Syllabus-2019-2020

(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 ✓ Professional 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-2019-2020

(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 ✓ Professional 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-2019-2020

(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 ✓ Professional 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-2019-2020

(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 ✓ Professional 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-2019-2020

(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 ✓ Professional 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-2019-2020

(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 ✕ Professional 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-2019-2020

(SOET)(BTech-CivilEngineering)

Title of the Course	Engineering Mathematics-IV
Course Code	MAL0408[T]

Part A

Year	2nd	**Semester**	4th	**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 ✕ Professional 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-