Syllabus-2021-2022

(SOET)(BTech-CivilEngineering)

Title of the Course	Minor Project
Course Code	CED0603[P]

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					0	0	2	2
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 ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure) 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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Syllabus-2021-2022

(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 ✓ Professional 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-2021-2022

(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 ✓ Professional 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 Geosynthetics, types of geosynthetics, artificial and natural geosythetics and their applications, manufacture of geosynthetics, strength of reinforced soils, testing of Geosynthetics	Lectures with problem based learning, experimental learning	10
2	Drainage application of geosynthetics, filtration applications of geosynthetics, erosion control using geosynthetics. Geosynthetics in flexible payment, introduction to geosyenthitcs in landfills, geosynthetics for construction of landfills	Lectures with problem based learning, experimental learning	8
3	Sustainable infrastructure development, different types of soil retaining structures, design codes for reinforced soil retaining walls, construction aspects of geosythetics reinforced soil retaining wall, testing requirements for reinforced soil retaining walls, geosynthetic reinforced soil embankment	Lectures with problem based learning, experimental learning	8
4	Design of reinforced soil retaining walls – simple geometry, design of reinforced soil retaining walls – sloped backfill soil, soil embankments supported on geocell mattresses, geosynthetic reinforced pile systems for high embankments	Lectures with problem based learning, experimental learning	8
5	Reinforced soil for supporting shallow foundations, response of footings resting on reinforced foundation soils, bearing capacity analysis of footings resting on reinforced foundation soils, carbon footprint analysis	Lectures with problem based learning, experimental learning and site visits	9

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-2021-2022

(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 ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✕		**SDG (Goals)**	SDG9(Industry Innovation and Infrastructure)				

Part B

Modules	Contents	Pedagogy	Hours
1	Introduction Basic Concepts of Finite Element Analysis, Introduction to Elasticity, Steps in Finite Element Analysis, Virtual Work and Variational Principle, Galerkin Method, Finite Element Method:, Displacement Approach, Stiffness Matrix and Boundary Conditions	Lectures with problem based learning, derivation based techniques, and software based simulations	10
2	Natural Coordinates, Triangular Elements, Rectangular Elements, Lagrange and Serendipity Elements, Solid Elements, Isoparametric Formulation, Stiffness Matrix of Isoparametric Elements, Numerical Integration: One Dimensional, Numerical Integration: Two and Three Dimensional	Lectures with problem based learning, derivation based techniques, and software based simulations	10
3	Stiffness of Truss Members, Analysis of Truss, Stiffness of Beam Members, Analysis of Continuous Beam, Plane Frame Analysis, Analysis of Grid and Space Frame	Lectures with problem based learning, derivation based techniques, and software based simulations	8
4	Constant Strain Triangle, Linear Strain Triangle, Rectangular Elements, Numerical Evaluation of Element Stiffness, Computation of Stresses, Geometric Nonlinearity and Static Condensation, Axisymmetric Element, Finite Element Formulation of Axisymmetric Element, Finite Element Formulation for 3 Dimensional Elements	Lectures with problem based learning, derivation based techniques, and software based simulations	10
5	Finite Elements for Elastic Stability, Finite Elements in Fluid Mechanics, Dynamic Analysis	Lectures with problem based learning, derivation based techniques, and software based simulations	8

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	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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CELEBRATING DREAMS

Syllabus-2021-2022

(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 ✓ Professional 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-2021-2022

(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 ✓ Professional 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, portal method and cantilever method	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Earth Retaining Structures: Cantilever and counter fort types retaining walls retaining wall with surcharge design	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	PS
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-2021-2022

(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 ✓ Professional 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	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..	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.	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Cost works : Factors affecting cost of work, overhead charges Contingencies.	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. .	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-2021-2022

(SOET)(BTech-CivilEngineering)

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

Part A

Year	3rd	**Semester**	6th	**Credits**	L	T	P	C
					3	1	2	6
Course Type	Embedded theory and lab							
Course Category	Discipline Core							
Pre-Requisite/s				**Co-Requisite/s**				
Course Outcomes & Bloom's Level	**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)**							
Coures Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✕ Gender ✕ Human Values ✕ Environment ✓		**SDG (Goals)**	SDG6(Clean water and sanitation) SDG7(Affordable and clean energy) SDG11(Sustainable cities and economies)				

Part B

Modules	Contents	Pedagogy	Hours
1	Estimation of ground and surface water resources. quality of water from different sources, demand & quantity of water, fire demand, water requirement for various uses, fluctuations in demand, forecast of population.	Lectures with Presentation, Site Visit to STP	8
2	Impurities of water and their significance, water-borne diseases, physical, chemical and bacteriological analysis of water, water standards for different uses. Intake structure, conveyance of water, pipe materials, pumps - operation & pumping stations.	Lectures with Presentation, Seminar and experiments	8
3	Water Treatment methods-theory and design of sedimentation, coagulation, filtration, disinfection, aeration & water softening, modern trends in sedimentation & filtration, miscellaneous methods of treatment.	Lectures with Presentation, Site Visit to STP	8
4	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, Seminar and experiments	8
5	Characteristics and analysis of waste water, recycles 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

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-