

Syllabus-2020-2021

(SOET)(BTech-CivilEngineering)

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

Part A

Year	3rd	Semester	6th	Credits	L	T	P	C
					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)							
Courses 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

Syllabus-2020-2021

(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, strength of material			Co-Requisite/s			
Course Outcomes & Bloom's Level	<p>CO1- To remember the various concepts in theory of steel structures(BL1-Remember)</p> <p>CO2- To understand & analyze the different steel structures problems.(BL2-Understand)</p> <p>CO3- To implement the different designing concepts of steel structures(BL3-Apply)</p> <p>CO4- To provide experimental basis, and to enable the students to analyze the behaviour of various steel structures and its properties.(BL4-Analyze)</p> <p>CO5- To evaluate the applications of different steel structural members in various fields such as research & industries.(BL5-Evaluate)</p> <p>CO6- To apply the understanding of steel structure problems in identifying the quality of steel and its different types.(BL6-Create)</p>						
Courses 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	F
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-2020-2021

(SOET)(BTech-CivilEngineering)

Title of the Course	Water Resource & Irrigation Engineering							
Course Code	CEL0618[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	<p>CO1- To remember the various concepts in theory of irrigation engg. (BL1-Remember)</p> <p>CO2- To understand & analyze the different irrigation engg problems.(BL2-Understand)</p> <p>CO3- To implement the different designing concepts of canal and well structures.(BL3-Apply)</p> <p>CO4- To provide experimental basis, and to enable the students to analyze the flood prediction.(BL4-Analyze)</p> <p>CO5- To evaluate the applications of different irrigation engg in various fields such as research & industries.(BL5-Evaluate)</p>							
Courses 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, linings 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

Syllabus-2020-2021

(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	<p>CO1- Torememberthevarious concepts Steel Design.(BL1-Remember)</p> <p>CO2- Tounderstandthe concept of design of Multi-Storey Buildings.(BL2-Understand)</p> <p>CO3- To implementthe different designing concepts retaining of earth work with retaining walls.(BL3-Apply)</p> <p>CO4- Toprovidedifferent types of structural elements as per the requirement of structure(BL3-Apply)</p> <p>CO5- Todesignthe silos and bunkers(BL5-Evaluate)</p> <p>CO6- ToCreate different RCC Complex structures with designing(BL4-Analyze)</p>							
Coures Elements	Skill Development ✓ Entrepreneurship ✗ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		SDG (Goals)					

Part B

Modules	Contents	Pedagogy	Hours
unit I	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
unit II	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	F
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-2020-2021

(SOET)(BTech-CivilEngineering)

Title of the Course	Railway, Bridges and tunnel engineering							
Course Code	CEL0620[T]							
Part A								
Year	3rd	Semester	6th	Credits	L	T	P	C
					2	1	1	4
Course Type	Theory only							
Course Category	Discipline Core							
Pre-Requisite/s	basic materials used in construction			Co-Requisite/s	properties of transportation material			
Course Outcomes & Bloom's Level	<p>CO1- To remember the various concepts in theory of railway, bridge and tunnel engineering. (BL1-Remember)</p> <p>CO2- To understand & analyze the different railway, bridge and tunnel engineering problems(BL2-Understand)</p> <p>CO3- To implement the different designing concepts of railway tracks and foundations used in bridge.(BL3-Apply)</p> <p>CO4- To provide experimental basis, and to enable the students to suggest suitable material from among the available in the field of construction and manufacturing.(BL2-Understand)</p> <p>CO5- To evaluate the load behavior acting on these structures and thus understand the failure concepts. (BL4-Analyze)</p> <p>CO6- To apply the understanding of signal design, economical span, design loads in solving problem of signal at railway stations and loading pattern on railway bridges. (BL3-Apply)</p>							
Courses Elements	Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗		SDG (Goals)					

Part B

Modules	Contents	Pedagogy	Hours
unit 1	Introduction, Tractive resistances & Permanent way: Principles of Transportation, transportation by Roads, railways, Airways, Waterways, their importance and limitations, Route surveys and alignment, railway track, development and gauges, Hauling capacity and tractive effort. i) Rails: types, welding of rails, wear and tear of rails, rail creep. ii) Sleepers: types and comparison, requirement of a good sleeper, sleeper density. iii) Rail fastenings: types, Fish plates, fish bolts, spikes, bearing plates, chain keys, check and guard rails. iv) Ballast: Requirement of good ballast, various materials used as ballast, quantity of ballast, different methods of plate laying, material trains, calculation of materials required, relaying of track	Lectures with problem based learning, experimental learning, case study, field trips	10
unitII	Geometric Design; Station & Yards; Points and Crossings & Signaling and interlocking: Formation, cross sections, Super elevation, Equilibrium, Cant and Cant deficiency, various curves, speed on curves. Types, locations, general equipment's, layouts, marshalling yards, Definition, layout details, design of simple turnouts, Types of signals in stations and yards, principles of signaling and inter-locking.	Lectures with problem based learning, experimental learning, case study, field trips	9
unit III	Bridge Site Investigation and Planning; Loading Standards & Component parts: Selection of site, alignment, collection of bridge design data: essential surveys, hydraulic design, scour, depth of bridge foundation, Economical span, clearance, afflux, type of road & railway bridges. Design loads and forces, Impact factor, Indian loading standards for Railways Bridges and Highway Bridges, Bridge super structure and sub-structures, abutments, piers, wing walls, return walls, approaches, floors & flooring system, choice of super structure.	Lectures with problem based learning, experimental learning, case study, field trips	8
unit IV	Bridge Foundations, Construction, Testing and Strengthening of Bridges: Different types of foundation: piles and wells, sinking of wells, coffer-dams. Choice of bridges and choice of materials, details of construction underwater and above water, sheet piles coffer dams, Erection of bridges, girders, equipments and plants. Inspection and Data collection, strengthening of bridges, Bridge failure.	Lectures with problem based learning, experimental learning, case study, field trips	10
unit V	Tunnels: 1. Selection of route, Engineering surveys, alignment, shape and size of tunnel, bridge action, pressure relief	Lectures with problem based learning, experimental learning, case study, field trips	8

phenomenon, Tunnel approaches, Shafts, pilot shafts 2, Construction of tunnels in soft soil, hard soil and rock, Different types of lining, methods of lining, Mucking operation, Drainage and ventilation, Examples of existing important tunnels in India and abroad.		
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Part C

Modules	Title	Indicative-ABCA/PBL/ Experiments/Field work/ Internships	Bloom's Level	Hours
unit I	module of track	PBL	BL4-Analyze	3
unit II	case study	Field work	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
0	0	0	0	0	0

Part E

Books	Railway, Bridges & Tunnels by rangwala
Articles	https://dopdfdownload.com/railway-bridge-and-tunnel-engineering.pdf
References Books	khanna publisher
MOOC Courses	https://online-learning.tudelft.nl/courses/railway-engineering-an-integral-approach
Videos	https://www.youtube.com/watch?v=37WMS483T7Y

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



Syllabus-2020-2021

(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	<p>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)</p>							
Courses 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 and abstract sheet; bills of quantities	Lectures with problem based learning, experimental learning, case study, field trips	10
unit II	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

