

Quantum University, Roorkee

Course Outcomes for the Syallbus 2022-24 Batch



Master of Technology in Structural

Program Name **Engineering**
 Course Name **Structural Analysis-A Matrix Approach**
 Course Code **CE4101**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students will be able to analyze the concept of Matrix Methods of Analysis	2	Em
CO2	Students will be able to analyze the Continuous Beams using Stiffness method and flexibility method.	2	S
CO3	Students will be able to analyze Two Dimensional Portal Frames with different end conditions- plotting of bending moment diagrams	2	S
CO4	Students will be able to analyze Two-Dimensional Pin jointed Trusses by stiffness and flexibility method.	2	En
CO5	Students will be able to analyze the concept of Matrix Methods of Analysis	1	None

Course Name **Advance Construction Techniques**
 Course Code **CE4102**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	The students will be able to understand the importance of pile foundation, types of piles, testing of piles, causes of failures of piles.	2	Em
CO2	The students will be able to understand the concept of coffer dams, its design and selection criterion.	2	S
CO3	The students will be able to understand the various types of loads on caissons, its design feature, construction materials used.	2	S
CO4	The students will be able to understand the various methods to Control of Ground Water in Excavations.	2	En
	The students will be able to understand the		



CO5	Planning and Construction of Earthquake	1	None
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Course Name **Advanced Design of Concrete Structures**

Course Code **CE4103**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	To understand the design concept Continuous Beams and Curved Beams	2	Em
CO2	students will able to design of flat slab	2	S
CO3	student will able understand and design concept of bunker and silos	2	S
CO4	student will able to design the elevated water tank	2	En
CO5	student will understand and design the portal frames	1	None

Course Name **Bridge Design**

Course Code **CE4104**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	The student will able to understand the introduction and investigation of bridge	2	Em
CO2	The Students will be able to analyzing various loads on bridge	2	S
CO3	The students will be able to design the Slab and T Beam	2	S
CO4	The students will be able to design long span bridge	2	En
CO5	The students will be able to understand the various type of bearing	1	None

Course Name **Finite Element Analysis**

Course Code **CE4105**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the basic concept of beam, truss and frame structure	2	Em
CO2	Student will able to understand about the mess convergence for precise study	2	S
CO3	Student will able to understand the shape function related to analysis of practical concept	2	S
CO4	Student will able to understand about the energy and virtual work concept	2	En
CO5	Student analysis the problem related to the beam and truss	1	None

Course Name **Concept of Ductile Detailing**
Course Code **CE4106**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the flexural detailing of ductile member	2	Em
CO2	Student will able to understand the column, beam column joint and detailing od shear wall	2	S
CO3	Student will able to understand the toughness and resilience of the RC structure	2	S
CO4	Student will able to understand the ductile detailing of structure under the dynamic loading	2	En
CO5	Student will able to analysis the filed problem related to the frame joint	1	None

Course Name **Construction Machinery and Equipments**
Course Code **CE4107**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand construction equipment	2	Em
CO2	Students should be able to understand construction equipment selection	2	S
CO3	Students should be able to understand types Excavating Equipment	2	S
CO4	Students should be able to understand Hauling and Conveying Equipment	2	En
CO5	Students should be able to understand Planning for Building Construction	1	None

Course Name **Advanced Solid Mechanics**

Course Code **CE4108**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/
CO1	Students should be able to understand the basic concept of vector and tensor analysis.	2	S
CO2	Students should be able to understand the concept of Stress tensor and transformation.	2	S
CO3	Students should be able to understand the concept of Isotropic stress deformation theory, Yield functions, and Work hardening and Flow rules.	2	S
CO4	Students should be able to understand the concept of Visco-elastic material, Stress strain relation, Various models, Creep and Relaxation.	2	S
CO5	Students should be able to analyze Thick-walled annular cylinder Courseed to uniform boundary	3	S

Course Name **Advanced Design of Steel Structures**

Course Code **CE4201**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
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CO1	Student will able to design the beam and column under wind load.	2	Em
CO2	Student will able to design the connection	2	S
CO3	Student will able to design the tower	2	S
CO4	Student will able to understand the design of industrial building	2	En
CO5	Student will able to analysis the plastic theory	1	None

Course Name **Design of Pre-Stressed Concrete Structures**

Course Code **CE4202**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	To understand the General Principles of Pre-stressing	2	Em
CO2	To analysis and Design of Tension Members	2	S
CO3	To perform analysis and Design of Compression Members and Losses of Prestress	2	S
CO4	To understand the concept of Composite Beams	2	En
CO5	To Analysis and design of prestressed members continuous beams	1	None

Course Name **RCC Design Lab**

Course Code **CE4240**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the structural modelling and basic tools	2	Em
CO2	Student will able to analysis the structure against Earthquake load	2	S
CO3	Student will able to analysis the structure against wind load	2	S

Course Name **Design of Tall Buildings**

Course Code **CE4209**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	student will able to understand the Structural Systems And Design concept	2	Em
CO2	student will able to Analysis the structure to check there torsional instability	2	S
CO3	student will able to design of Chimneys	2	S
CO4	student will able to analysis and design of Cooling Towers	2	En
CO5	student will able to analysis and design of Transmission Towers	1	None

Course Name **Theory of Plates and Shells**
Course Code **CE4210**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the plate theory	2	Em
CO2	Student will able to analysis the plate on the basis of Napier's and levy's theory	2	S
CO3	Student will able to analysis the circular plate	2	S
CO4	Student will able to understand the shell analysis	2	En
CO5	Student will able to analysis the member an	1	None

Course Name **Fire Resistance of Structures**
Course Code **CE4211**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to analysis the classification of building and its types of production process	2	Em
CO2	Student will able to design the fire resistance building	2	S
CO3	Student will able to understand the test for fire resistance structure	2	S
CO4	Student will able to design the fire resistant rcc and wooden structure	2	En
CO5	Student will able to analysis the fire-resistant column	1	None

Course Name **Safety of Structures**
Course Code **CE4212**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the concept of structural safety	2	Em
CO2	Student will able to understand the statistic and probabilistic theory	2	S
CO3	Student will able to apply the probability distribution for resistance and load	2	S
CO4	Student will able to analysis the reliability of structure	2	En
CO5	of reliability	1	None

Course Name **Soil Structure Interaction**
Course Code **CE4213**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the Soil-Foundation-Structure Interaction	2	Em
CO2	Student will able to understand Finite Beams on Elastic Foundations	2	S
CO3	Student will able to understand Plates on Elastic Foundations	2	S
CO4	Student will able to analysis the Oil Structure Interaction In Framed Structures	2	En
CO5	Student will able to understand the concept of Soil Pile Interaction	1	None

Course Name **Environment Impact Assessment**
Course Code **CE4214**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student should be able to able to carry out scoping and screening of developmental projects for environmental and social assessments	2	Em
CO2	Student should be able to able to explain different methodologies for environmental impact prediction and assessment	2	S
CO3	Student should be able to able to plan environmental impact assessments and environmental management plans	2	S
CO4	Student should be able to able to evaluate environmental impact assessment reports	2	En
CO5	Student should be able to able to understand the different the case studies	1	None

Course Name **Wind effect on structures**
Course Code **CE4215**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the basic concept of Nature of windstorm, Design wind speed.	2	S
CO2	Students should be able to understand the concept of Pressure & force coefficients flow around flat plates.	2	S
CO3	Students should be able to understand the concept of Along wind effects, Across wind effects and vortex shedding.	2	S
CO4	Students should be able to understand the concept of Basic force coefficients for bridges, Nature of dynamic response of long span bridges.	2	S
CO5	Students should be able to understand the concept of Flow simulation, Modeling, Flow	2	S

Course Name **Reliability based design**
Course Code **CE4216**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the basic concept of structural reliability and its role in civil engineering design.	2	S
CO2	Students should be able to analyze Events, random variables, Discrete and Continuous distributions, Functions of random variables and moments.	3	S
CO3	Students should be able to analyze Mean, Median, Mode, Higher moments, Empirical distribution, Sampling, Estimation theory and order statistics.	3	S
CO4	Students should be able to understand the basic concept of Methods of finding reliability, Weakest link structures, Single members; Several load conditions, Multi-member multi-load condition.	2	S



CO5	Students should be able to analyze using Failure modes and effects analysis (FMEA), Criticality	3	S
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Course Name **Foundation and Steel Design Lab**
Course Code **CE4340**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the load acting on foundation	2	Em
CO2	Student will able to analysis the bearing capacity of footing	2	S
CO3	Student will able to Design Pedestals for shear	2	S

Course Name **Research Methodology**
Course Code **ME4307**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the basic concept of research	2	Em
CO2	Student will able to understand Experimental Design	2	S
CO3	Student will able to understand Data Collection	2	S
CO4	Student will able to understand Multivariate Statistical Techniques	2	En
CO5	Student will able to understand Research Report	1	None

Course Name **Research Methodology Lab**
Course Code **ME4340**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to apply the basic formula on excel	2	Em
CO2	Student will able to use the tools of MS excel	2	S
CO3	Student will able to create presentation	2	S

Course Name **Advanced Foundation Engineering**
Course Code **CE4304**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the concept of soil exploration	2	Em
CO2	Students should be able to analyze the earth pressure for retaining wall	2	S
CO3	Students should be able to understand the types of foundation	2	S
CO4	Students should be able to analyze the bearing capacity of foundation	2	En
CO5	Students should be able to understand the concept of well and machine foundation	1	None

Course Name **Computer Application In Design**
Course Code **CE4305**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the basic knowledge of modelling	2	Em
CO2	Student will able to understand Cad Software	2	S



CO3	Student will able to perform Computer Aided Design	2	S
CO4	Student will able to understand the Entity Manipulation and Data Storage	2	En
CO5	Student will able to understand the Expanding Capability of CAD	1	None

Course Name **Advanced Concrete Technology**

Course Code **CE4306**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the Concrete Making Materials	2	Em
CO2	Student will able to understand the comprehensive Tests on Concrete	2	S
CO3	Student will able to Design mix of concrete	2	S
CO4	Student will able to understand Special Concrete	2	En
CO5	Student will able to understand Concreting Methods	1	None

Course Name **Plastic Analysis**

Course Code **CE4307**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Student will able to understand the basic concept of moment	2	Em
CO2	Student will able to Design of Continuous Beams	2	S
CO3	Student will able to Design secondary Problems	2	S
CO4	Student will able to Design Of Connections	2	En
CO5	Student will able to Design Of Steel Frames	1	None

Course Name **Statistical Methods and Algorithm**

Course Code **CE4314**



Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the basic concept of presentation of research proposal using statistical package.	2	S
CO2	Students should be able to analyze Appraisal of axiomatic approach of probability, Conditional probability, Baye's rule, Conditional distributions, and conditional expectations.	3	S
CO3	Students should be able to understand the basic concept of One Way and Two Way Classification: ANOVA for fixed effect model, ANOVA for Random Effect Model.	2	S
CO4	Students should be able to understand Design of Experiments and Multivariate Data Analysis.	3	S
CO5	Students should be able to understand Time Series and forecasting.	2	S

Course Name **Structural Material**
Course Code **CE4315**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the basic concept of Supplementary Cementing Materials Strength properties; Durability properties.	2	S
CO2	Students should be able to understand Types of concrete, Material selection and its properties.	2	S
CO3	Students should be able to understand Polymer Concrete Composites, Types of polymer concretes and their applications.	2	S
CO4	Students should be able to understand Fiber Reinforced Plastics (FRP), Types of FRP, their properties and effects on concrete elements under various loading conditions.	2	S



CO5	Students should be able to understand Use of Waste Materials and By-products	2	S
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Course Name **Plates and Shells**
Course Code **CE4316**

Unit-wise Course Outcome	Descriptions	BL Level	Employability (Emp)/ Skill(S)/ Entrepreneurship (Emt)/ None (Use , for more than
CO1	Students should be able to understand the basic concept of Pure Bending of Plates Slopes and curvatures, Relations between them.	2	S
CO2	Students should be able to understand the basic concept of Symmetrical Bending of Circular and Rectangular Plates.	3	S
CO3	Students should be able to understand Development of shell structures, Advantages and disadvantages, Forms of shells, Mathematical equations of various curves connected with shells,	3	S
CO4	Students should be able to understand the basic concept of Folded Plate Structures.	2	S
CO5	Students should be able to understand Various methods for analyzing grids for roofs and	2	S