

Proposed Curriculum

Civil Engineering Department

Semester	Course Code	Subject	CLO	Statement	PLO	Bloom's
1	CE-101 T	Engineering Drawing-Th	CLO-1	Describe basics of engineering drawing	PLO-1	C-1
			CLO-2	Explain fundamentals of architectural, structural, plumbing and electrical drawing	PLO-2	C-2
	CE-101 L	Engineering Drawing-Lab	CLO-1	Identify the tasks related to engineering drawing	PLO-9	P-2
			CLO-2	Illustrate basic concepts of engineering drawing	PLO-4	C-2
			CLO-3	Justify application of engineering drawing as backbone of construction work	PLO-10	A3
	CE-102 T	Engineering Mechanics-Th	CLO-1	Describe the basic concepts of equilibrium and explain their application in civil engineering	PLO-1	C-2
			CLO-2	Apply fundamental concepts of statics & kinematics for analyzing forces in statically determinate structures	PLO-2	C-3
	CE-102 L	Engineering Mechanics-Lab	CLO-1	Perform the experiments related to engineering mechanics	PLO-9	P-3
			CLO-2	Estimate the physical parameters using experimental data	PLO-4	C-2
			CLO-3	Justify application of experiments related to engineering mechanics	PLO-10	A-3
CE-103 T	Engineering Geology	CLO-1	Describe basic concepts of geology, principle of rock formation and structural features of strata	PLO-1	C-2	
		CLO-2	Apply knowledge of geology in analyzing civil engineering	PLO-2	C-3	

2			CLO-3	Categorize rocks based on their engineering properties	PLO-4	C-4
	CE-104 T	Surveying-I Th	CLO-1	Explain various principles and techniques of basic surveying	PLO-1	C-2
			CLO-2	Apply various techniques to calculate parameters required for plotting survey maps	PLO-3	C-3
	CE-104 L	Surveying-I Lab	CLO-1	Perform the experiments related to basic surveying	PLO-9	P-2
			CLO-2	Plot area maps using experimental data	PLO-2	C-4
			CLO-3	Justify application of experiments related to surveying	PLO-6	A-3
	MA-105	Mathematics-I	CLO-1	Acquire knowledge related to basic concepts of calculus, statistics, and ODEs	PLO-1	C-2
			CLO-2	Apply concepts for analysis and solution of civil engineering related problems	PLO-2	C-3
	CE-106 T	Surveying-II Th	CLO-1	Explain principles and application of advanced surveying	PLO-1	C-2
			CLO-2	Apply various survey techniques for traversing and setting out of curves	PLO-3	C-3
CE-106 L	Surveying-II Lab	CLO-1	Demonstrate the experiments related to advanced surveying using modern tools	PLO-5	P-4	
		CLO-2	Plot area maps using experimental data	PLO-4	C-4	
		CLO-3	Justify application of experiments related to surveying	PLO-6	A-3	
CE-107 T	Engineering Materials Th	CLO-1	Discuss basic properties of civil engineering materials for environmentally sustainable construction	PLO-7	C-2	
		CLO-2	Carry out selection of materials according to various requirements	PLO-4	C-3	
CE-107 L	Engineering Materials Lab	CLO-1	Perform experiments related to engineering materials	PLO-9	P-2	

			CLO-2	Analyze the physical parameters using experimental data	PLO-4	C-3
			CLO-3	Justify application of experiments related to engineering materials	PLO-10	A-3
	CE-108	Professional Ethics	CLO-1	Identify the content of religious, national, or international law dealing with engineering ethics	PLO-6	C-2
			CLO-2	Discuss professional aspects of ethics from constitution of Pakistan and Pakistan Engineering Council's code of ethics and conduct	PLO-8	C-2
			CLO-3	Express and debate the ethical dilemma implicit in an article or a document, formulate possible actions that can be taken in response to a given ethical dilemma, and evaluate the probable consequences of these actions	PLO-12	A-3
	MA-109	Mathematics-II	CLO-1	Acquire knowledge related to basic concepts of calculus, statistics, and ODEs	PLO-1	C-2
			CLO-2	Apply concepts for analysis and solution of engineering related problems	PLO-3	C-3
	HU-110	Pakistan Studies	CLO-1	Discuss the important events of history and ask about student deep understanding of the different historical events	PLO-6	A-2
			CLO-2	Investigate the contemporary issues of Pakistan and to have a deep comprehension of the problems/ issues which the country is facing	PLO-4	A-3
			CLO-3	Analyze different clauses of the constitutions and their feasibility and relate the understanding of different social issues	PLO-8	C-4

	CE-111	Professional English	CLO-1	Consolidate and extend students' vocabulary, so that they can compose sentences and paragraphs effectively	PLO-12	A-2
			CLO-2	Critically read and analyze a text, and to engage in topic relevant discussions with peers drawing on a wide range of information sources and experiences	PLO-10	A-2
3	CE-201 T	Fluid Mechanics-I Th	CLO-1	Explain the basic concepts of fluid at rest and motion	PLO-1	C-2
			CLO-2	Apply fundamental concepts for problem solving in fluid statics and kinematics	PLO-4	C-3
	CE-201 L	Fluid Mechanics-I Lab	CLO-1	Conduct experiments related to basic fluid mechanics	PLO-9	P-4
			CLO-2	Estimate the hydraulic parameters using experimental data	PLO-4	C-3
			CLO-3	Justify experiments related to basic fluid mechanics	PLO-10	A-3
	CE-202 T	Properties of Concrete Th	CLO-1	Discuss materials, activities and problems related to concrete	PLO-1	C-2
			CLO-2	Implement concrete mix designs considering various parameters using standard guidelines	PLO-3	C-3
	CE-202 L	Properties of Concrete Lab	CLO-1	Conduct experiments related to properties of concrete	PLO-9	P-4
			CLO-2	Illustrate the physical parameters using experimental data	PLO-4	C-3
			CLO-3	Justify application of experiments related to properties of concrete	PLO-10	A-5
	CE-203 T	Engineering Practice Th	CLO-1	Analyze and undertake all tasks with full professional honesty	PLO-8	C-3
			CLO-2	Justify the concepts of construction engineering in different situations	PLO-6	A-2
			CLO-3	Demonstrate knowledge of construction engineering in civil engineering projects	PLO-11	C-3

	CE-203 L	Engineering Practice Lab	CLO-1	Demonstrate the construction activities of civil engineering projects	PLO-11	P-3
			CLO-2	Carry out the assigned task reliably independent of help	PLO-9	C-3
			CLO-3	Choose advanced techniques and different latest equipment used in construction	PLO-5	A-3
	MA-204 T	Numerical Analysis & Computer Programming Th	CLO-1	Apply numerical analysis techniques for simpler to complex problems of applied engineering	PLO-3	C-3
	MA-204 L	Numerical Analysis & Computer Programming Lab	CLO-1	Apply C++/MATLAB programming language to write, debug and execute programs.	PLO-5	P-4
			CLO-2	Analyze and solve ordinary and partial differential equation numerically	PLO-4	C-4
			CLO-3	Contribute in solving complex engineering as well as daily life problems using analytical tools	PLO-12	A-2
	HU-206	Islamic Studies	CLO-1	Discuss fundamentals of Quran, Ahadees and their values in everyday life	PLO-10	A-1
			CLO-2	Recognize the importance of Islamic architecture in modern day engineering considering social and religious aspects/interests	PLO-12	C-1
			CLO-3	Discuss as well as interpret the social and religious aspects of Islamic ethics	PLO-8	A-2
	CE-212	Hazard & Disaster Management	CLO-1	Explain hazards and disasters and use their management for different scenarios	PLO-1	C-2
			CLO-2	Categorize the different phases of disaster management	PLO-11	C-4
			CLO-3	Conceptualize on sustainability after disaster occurrence	PLO-7	A-4
CLO-4			Develop emergency preparedness plan for different disasters	PLO-12	A-4	

4	CE-206 T	Theory of Structures-I Th	CLO-1	Discuss basic concepts of Structural Analysis for statically determinate structures	PLO-1	C-2
			CLO-2	Apply Structural Analysis concepts to measure deflections and forces in different types of structures	PLO-2	C-3
	CE-206 L	Theory of Structures-I Lab	CLO-1	Perform experiments related to analysis of determinate structures	PLO-9	P-2
			CLO-2	Prepare the solution of determinant structure using experimental data	PLO-3	C-3
			CLO-3	Justify application of experiments related to determinate structures	PLO-10	A-3
	CE-207 T	Strength of Materials-I Th	CLO-1	Discuss materials and their utilization in structures considering engineering properties	PLO-1	C-2
			CLO-2	Analyze and design structural members subjected to various loadings	PLO-3	C-4
	CE-207 L	Strength of Materials-I Lab	CLO-1	Conduct experiments related to mechanical properties of materials	PLO-9	P-4
			CLO-2	Illustrate the physical parameters using experimental data	PLO-2	C-3
			CLO-3	Conceptualize application of experiments related to mechanics of materials	PLO-10	A-4
	CE-208 T	Soil Mechanics-I Th	CLO-1	Describe the soil formation, its index, engineering properties and behavior	PLO-1	C-2
			CLO-2	Analyze the effects of loads, additives and water on behavior and properties of soil	PLO-2	C-4
			CLO-3	Prepare a soil investigation program and perform classification of soil	PLO-4	C-3
	CE-208 L	Soil Mechanics-I Lab	CLO-1	Perform experiments related to basic soil mechanics	PLO-9	P-5
CLO-2			Investigate the physical parameters using experimental data	PLO-4	C-3	

			CLO-3	Justify application of experiments related to soil mechanics	PLO-10	A-3	
	CE-209 T	Drawing, Estimation & Construction Th	CLO-1	Prepare the bill of quantities and perform rate analysis.	PLO-3	C-3	
			CLO-2	Describe the building construction methodologies and related processes.	PLO-4	C-2	
			CLO-3	Apply architectural and legal aspects of construction projects using PEC guidelines.	PLO-11	C-3	
	CE-209 L	Drawing, Estimation & Construction Lab	CLO-1	Accomplish a task related to architectural and constructional drawings	PLO-9	P-2	
				CLO-2	Solve various engineering management related projects.	PLO-12	C-3
				CLO-3	Justify the prepared bill of quantities.	PLO-10	A-3
	HU-210 T	Computer Application Th	CLO-1	Explain tools and steps in AutoCAD Software for drafting engineering drawings	PLO-1	C-2	
				CLO-2	Discuss the use of Ms Excel & MATLAB tools to solve different problems	PLO-2	C-2
				CLO-3	Demonstrate different functions of latest version of both AutoCAD (in detail) and Ms Excel (in general) related to civil engineering projects	PLO-5	C-3
	HU-210 L	Computer Application Lab	CLO-1	Practice AutoCAD Software for drafting of simpler to complex engineering drawings	PLO-5	P-3	
				CLO-2	Apply the use of Ms-Excel & MATLAB tools to solve different engineering problems	PLO-12	C-3
				CLO-3	Promote the use of AutoCAD to serve the society	PLO-6	A-3
	CE-211 T	Communication Skills & Technical Writing Th	CLO-1	Recognize and comprehend organizational communication system for improved knowledge of technical	PLO-10	C-2	

				writing skills needed professionally. Understanding of do's and don'ts of technical communication		
			CLO-2	Apply the acquired understanding of communication in life-long learning	PLO-12	C-3
	CE-211 L	Communication Skills & Technical Writing Lab	CLO-1	Express effective presentation and communication skills	PLO-10	A-3
5	CE-301 T	Theory of Structures II Th	CLO-1	Analyze different types of indeterminate structures using force and displacement based method	PLO-2	C-3
			CLO-2	Analyze different types of indeterminate structures	PLO-3	C-3
	CE-301 L	Theory of Structures II Lab	CLO-1	Conduct experiments related to analysis of indeterminate structures	PLO-9	P-4
			CLO-2	Estimate the physical parameters using experimental data	PLO-2	C-3
			CLO-3	Seeks the application of experimental data in design of sustainable structures	PLO-7	A-3
	CE-302 T	Strength of Materials II Th	CLO-1	Apply concepts of stress and strain transformation in structural members	PLO-1	C-3
			CLO-2	Analyze structural members under various loading conditions	PLO-2	C-4
	CE-302 L	Strength of Materials II Lab	CLO-1	Perform experiments related to advanced mechanics of materials	PLO-9	P-2
			CLO-2	Illustrate the physical parameters using experimental data	PLO-3	C-3
			CLO-3	Justify application of experiments related to advanced mechanics of materials	PLO-10	A-3
	CE-303 T	Soil Mechanics-II Th	CLO-1	Discuss the engineering properties of soil, stress distribution, concepts of slope failure and dynamic loading	PLO-1	C-2
			CLO-2	Analyze the engineering behavior of soil and stability of slopes	PLO-2	C-4
			CLO-3	Design various geotechnical structures	PLO-3	C-5

	CE-303 L	Soil Mechanics-II Lab	CLO-1	Applying modern tools to predict the soil behavior under different loading conditions	PLO-5	P-3
			CLO-2	Investigate the physical parameters using experimental data	PLO-4	C-3
			CLO-3	Justify experiments related to engineering properties of soil	PLO-10	A-3
	CE-304 T	Construction, Planning & Management Th	CLO-1	Define basics of project management and economics related to the civil engineering projects	PLO-11	C-1
			CLO-2	Apply different techniques of project management for planning and scheduling to control and facilitate project execution	PLO-2	C-3
			CLO-3	Demonstrate professional input in project planning and management	PLO-8	C-3
	CE-304 L	Construction, Planning & Management Lab	CLO-1	Plan various activities to monitor physical and financial progress of a project	PLO-11	P-4
			CLO-2	Discuss application of Primavera software in planning of projects	PLO-5	C-2
			CLO-3	Formulate and organize the scheduling of complex engineering problem using P-6	PLO-12	A-4
	CE-305 T	Hydrology & Water Resources Th	CLO-1	Discuss basic concepts of hydrology & water resources	PLO-1	C-2
			CLO-2	Solve various hydrological parameters using different techniques	PLO-2	C-3
	CE-305 L	Hydrology & Water Resources Lab	CLO-1	Perform experiments related to hydrology	PLO-9	P-2
			CLO-2	Investigate the physical parameters using experimental data	PLO-4	C-3
			CLO-3	Justify experiments related to hydrology & water resources	PLO-10	A-3
	6	CE-306 T	Environmental Engineering I Th	CLO-1	Explain types and sources of National and International environmental issues	PLO-7

			CLO-2	Carry out investigation to select best water sources for public supplies	PLO-4	C-3
			CLO-3	Design water Treatment and Supply system	PLO-3	C-6
	CE-306 L	Environmental Engineering I Lab	CLO-1	Perform experiments related to environmental engineering	PLO-9	P-2
			CLO-2	Estimate the physical parameters using experimental data	PLO-2	C-3
			CLO-3	Demonstrate environmental health and safety precautions in your lab work	PLO-7	A-3
	CE-307 T	Reinforced Concrete I Th	CLO-1	Discuss concepts of reinforced concrete structural members as per design provisions	PLO-1	C-2
			CLO-2	Perform analysis of reinforced concrete members for various loading conditions	PLO-2	C-3
			CLO-3	Apply working stress and ultimate strength methods in design of reinforced concrete members	PLO-3	C-3
	CE-307 L	Reinforced Concrete I Lab	CLO-1	Perform experiments to conduct quality evaluation of existing structures and hardened concrete	PLO-9	P-4
			CLO-2	Estimate the physical parameters using experimental data	PLO-2	C-3
			CLO-3	Apply the understanding of Reuse and recycle materials to design reinforced concrete structures	PLO-7	A-3
	CE-308 T	Design of Steel Structure Th	CLO-1	Explain specifications and design philosophy of structural steel members	PLO-1	C-2
			CLO-2	Analyze structural steel members under various loading conditions	PLO-2	C-4
			CLO-3	Apply design procedures for structural steel members and their connections	PLO-3	C-3
	CE-308 L	Design of Steel Structure Lab	CLO-1	Design components of steel roof truss and develop shop drawing according to the latest LRFD code	PLO-3	P-4

7			CLO-2	Accomplish the tasks of Analyzing steel roof truss under gravity and wind load	PLO-9	C-4	
			CLO-3	Apply the understanding of reuse and recycle steel waste into steel structures	PLO-7	A-3	
	CE-309 T	Fluid Mechanics II Th	CLO-1	Explain dimensional analysis and concepts of hydraulic machinery	PLO-1	C-2	
			CLO-2	Investigate flow through pipes and its characteristics	PLO-4	C-4	
	CE-309 L	Fluid Mechanics II Lab	CLO-1	Perform experiments related to hydraulic machinery	PLO-9	P-2	
			CLO-2	Discuss the components of hydraulic machinery	PLO-3	C-2	
			CLO-3	Justify experiments related to hydraulic machinery	PLO-10	A-3	
	CE-310 T	Transportation Engineering I Th	CLO-1	Explain the fundamentals of transportation engineering	PLO-1	C-2	
			CLO-2	Demonstrate design aspects of highways, traffic and railways engineering	PLO-2	C-3	
	CE-310 L	Transportation Engineering I Lab	CLO-1	Perform experiments related to pavement materials	PLO-9	P-2	
			CLO-2	Estimate the physical parameters using experimental data	PLO-2	C-3	
			CLO-3	Justify experiments related to material properties	PLO-10	A-3	
	7	CE-401 T	Environmental Engineering II Th	CLO-1	Demonstrate basic understanding of environmental issues in solving complex engineering problems in environmental engineering	PLO-7	C-3
				CLO-2	Design water supply and sanitation systems	PLO-3	C-6
CLO-3				Analyze EIS and Solid Waste Management Strategy	PLO-6	C-4	
CE-401 L		Environmental Engineering II Lab	CLO-1	Conduct experiments related to water and wastewater to determine quality	PLO-3	P-6	

			CLO-2	Develop capacity to observe field activities and writing reports	PLO-6	C-4
			CLO-3	Demonstrate the usage of apparatus for water & wastewater analysis	PLO-7	A-3
CE-402 T	Reinforced Concrete II Th		CLO-1	Explain concepts of analysis and design for reinforced concrete members	PLO-1	C-2
			CLO-2	Analyze different reinforced concrete members	PLO-4	C-4
			CLO-3	Apply various design approaches for reinforced concrete members	PLO-3	C-3
CE-402 L	Reinforced Concrete II Lab		CLO-1	Perform experiments related to reinforced concrete members	PLO-9	P-2
			CLO-2	Estimate the physical parameters using experimental data	PLO-2	C-3
			CLO-3	Use experimental data to highlight the importance of reinforce concrete members for innovative design	PLO-12	A-5
CE-403 T	Hydraulics Engineering Th		CLO-1	Apply principles of hydraulic engineering to open channel flow	PLO-1	C-3
			CLO-2	Analyze open channel profiles and effect of hydraulic structures such as dams & spillways	PLO-2	C-4
			CLO-3	Discuss hydraulic similitude and sediment transport	PLO-3	C-2
CE-403 L	Hydraulics Engineering Lab		CLO-1	Perform experiments related to flow and sediment transport through open channel	PLO-9	P-2
			CLO-2	Estimate the hydraulic parameters using experimental data	PLO-4	C-3
			CLO-3	Generate experimental data to highlight the importance of hydraulic structure for innovative design	PLO-12	A-5
CE-404 T	Transportation Engineering II Th		CLO-1	Explain fundamentals of pavement and airport engineering	PLO-1	C-2

			CLO-2	Apply principles of pavement engineering to analyze and design of pavements	PLO-3	C-3
	CE-404 L	Transportation Engineering II Lab	CLO-1	Perform experiments related to pavement materials	PLO-9	P-2
			CLO-2	Implement asphalt mix design considering various parameters using standard guidelines	PLO-2	C-3
			CLO-3	Justify experiments related to material properties and design	PLO-10	A-3
	CE-405 T	Foundation Engineering Th	CLO-1	Analyze various design options for foundations according to field conditions	PLO-3	C-4
			CLO-2	Perform bearing capacity and settlement analysis of foundations for different types of soils	PLO-2	C-3
			CLO-3	Evaluate foundations considering various geotechnical parameters	PLO-4	C-5
	CE-405 L	Foundation Engineering Lab	CLO-1	Perform experiments related to foundation design	PLO-9	P-2
			CLO-2	Categorize the physical parameters using experimental data	PLO-2	C-4
			CLO-3	Support the experimental data to highlight the importance of foundations for innovative design	PLO-12	A-5
8	CE-407 T	Structural Engineering Th	CLO-1	Apply matrix based methods for analysis of various structural components	PLO-2	C-3
			CLO-2	Design pre-stressed concrete members, and bridge decks	PLO-3	C-5
			CLO-3	Discuss SDOF system for free and forced vibration with and without viscous damping	PLO-1	C-2
	CE-407 L	Structural Engineering Lab	CLO-1	Perform experiments related to structural analysis	PLO-9	P-2

			CLO-2	Investigate the physical parameters using experimental data	PLO-4	C-3
			CLO-3	Utilize the experimental data to highlight the importance of various structures for innovative design	PLO-12	A-5
CE-408 T	Irrigation Engineering Th		CLO-1	Apply theoretical principles of Irrigation Engineering	PLO-4	C-3
			CLO-2	Design gravity irrigation system with unlined canals.	PLO-3	C-5
CE-408 L	Irrigation Engineering Lab		CLO-1	Execute the design of barrage and cross drainage works	PLO-9	P-4
			CLO-2	Design barrages and cross drainage works for simple conditions	PLO-3	C-5
			CLO-3	Produce experimental data to design irrigation channels	PLO-12	A-5
CE-409 T	Design of Structures Th		CLO-1	Justify selection of structural systems for various functions	PLO-2	C-5
			CLO-2	Design complete RC structures in compliance with the standard codes of practices	PLO-3	C-5
			CLO-3	Discuss concepts of earthquake engineering for changes in structural design	PLO-1	C-2
CE-409 L	Design of Structures Lab		CLO-2	Develop the detailed structural working drawings	PLO-9	P-2
			CLO-1	Design different RC structures using the standard codes of practices	PLO-3	C-6
			CLO-3	Investigate the selection of different structural systems	PLO-4	A-5
CE-410 T	Computer Aided Design Th		CLO-1	Discuss finite element modeling of civil engineering structures	PLO-1	C-2
			CLO-2	Produce input files for analysis and design of real 3D structures using the latest commercial software	PLO-3	C-3
			CLO-3	Elaborate the importance of computer design in execution of projects	PLO-11	C-5

	CE-410 L	Computer Aided Design Lab	CLO-1	Demonstrate use of software for analysis and design of structures	PLO-5	P-3
			CLO-2	Discuss use of latest codes and software for analysis and design of civil engineering structures	PLO-2	C-2
			CLO-3	Generate the experimental data to highlight the importance of numerical modelling for innovative design	PLO-12	A-5

PLO	PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10	PLO-11	PLO-12
Quantity	28	29	30*	26*	10*	10*	10*	07*	28*	22*	09*	17*

***THIS CLO-PLO MAPPING INCLUDES FYDP PLO'S AS WELL**