

COURSE LEARNING OUTCOME (CLOs) BATCH 2017

Semester	CLOs	CLO Statement At the end of this course, students will be able to:	PLOs	Bloom's
1 Fall	Engineering Surveying-I (UE-118)			
	CLO-1	Able to describe the principles of engineering surveying.	Engineering Knowledge	C-2
	CLO-2	Able to observe readings of surveying instruments.	Individual and Team Work	S-1
	CLO-3	Able to solve land surveying problems.	Problem Analysis	C-3
2 Spring	Engineering Drawing and Drafting-I (UE-117)			
	CLO-1	Capability to acquire the basic engineering knowledge related to solid objects.	Engineering Knowledge	C-1
	CLO-2	Capability to draw the basic shapes in two and three dimensional plane.	Modern Tool Usage	C-3
	CLO-3	Able to practice engineering drawing manually and through softwares with supervision.	Communication	S-3
	Statics and Dynamics (UE-102)			
	CLO-1	Able to apply the basic principles of engineering mechanics and able to apply learning in new situations through their problem analysis capability.	Engineering Knowledge	C-3
	CLO-2	Able to use the mathematical tools and the standard procedures to determine internal loadings in members of truss, beam, frame and cable with good problem solving skills.	Problem Analysis	C-3
	CLO-3	Able to use their creativity, imagination and knowledge to practice skills of analysis or design as required by the engineering discipline.	Investigation	S-3

	Engineering Materials (UE-104)			
	CLO-1	Able to select, describe and recognize building materials based on manufacturing methods, types, properties and uses.	Engineering Knowledge	C-1
	CLO-2	Able to solve complex engineering problems related to concrete mix design based on experimental values.	Problem Analysis	C-3
	CLO-3	Able to perform, manipulate laboratory tests related to different engineering materials and also able to answer freely about the practical procedure.	Investigation	S-3 A-2
3 Fall	Engineering Surveying - II (UE-215)			
	CLO-1	Able to calculate areas and volume from topographic maps and able to solve problems related to highways and railroad curves.	Problem Analysis	C-3
	CLO-2	Able to describe concepts of geospatial positioning, construction and bathymetric survey.	Engineering Knowledge	C-2
	CLO-3	Able to operate digital equipments in the field of surveying.	Modern Tool Usage	S-3
	Mechanics of Solids (UE-212)			
	CLO-1	Able to use the concepts of material strength and their behavior under loads.	Engineering Knowledge	C-3
	CLO-2	Able to analyze structural components like beams, shafts and thin and thick walled cylinders.	Problem Analysis	C-4 A-2
	CLO-3	Able to apply knowledge in investigation of stresses.	Investigation	C-4
	CLO-4	Able to develop skills for identifying appropriate materials for Civil engineering structures.	Lifelong Learning	S-2

Engineering Drawing & Drafting -II (UE-205)			
CLO-1	Able to apply building regulations to carry out residential planning and prepare engineering drawings in architectural and structural modes.	Design/Development of Solutions	C-3
CLO-2	Able to sketch digital drawing of residential units using CAD latest version.	Modern Tool Usage	C-3 S-3
CLO-3	Able to produce and communicate the details of project (architectural and structural) through the drawings.	Communication	S3
Urban Sociology (AR-204)			
CLO-1	Able to describe interactive methods, types and uses of social gen to select best behavior for working with people of city, and society at large and built environment.	The Engineer and Society	C-2
CLO-2	To learn social mix design method in order to select appropriate amount of ingredients of good social engagement that helps to build safer society.	Ethics	C-2
CLO-3	Able to describe the individual characteristics of city and social issues and able to discuss the importance of team work to prevent chaos in society.	Individual and team Work	C-2
Computing Tools & Application (UE-114)			
CLO-1	Ability to perform computations and data analysis using spread sheet software.	Communication	S-3
CLO-2	Ability to describe and work on simple database using database software.	Modern Tool Usage	C-2 S-3
CLO-3	Ability to apply the programming skills to solve basic engineering problems using computer programming software (MATLAB).	Lifelong Learning	C-3 S-3

4 Spring	Planning & Design of Transportation Systems (UE-361)			
	CLO-1	Able to apply the basic concepts of planning for transportation systems.	Engineering Knowledge	C-3
	CLO-2	Able to perform geometric and pavement design of highways and runways.	Design/Development of Solutions	C-5
	CLO-3	Able to produce automated geometric and pavement design.	Individual and Team Work	S-4
	Fluid Mechanics (UE-214)			
	CLO-1	Able to describe the basic concepts and principles of fluid mechanics.	Engineering Knowledge	C-2
	CLO-2	Able to apply the basic fluid principles in general engineering problem.	Problem Analysis	C-3
	CLO-3	Able to detect basic fluid properties and flow types.	Investigation	S-1
	Analysis of Structures (UE-209)			
	CLO-1	Able to estimate loads and able to apply deformation characteristics by small deflection theory and energy methods.	Lifelong Learning	C-3
	CLO-2	Able to analyze determinate and indeterminate pin connected and frame structures by various techniques.	Problem Analysis	C-3
	Geology for Engineers (UE-216)			
	CLO-1	Able to identify interior parts of the earth, Define crystals, rocks and minerals, Identify geological structures.	Engineering Knowledge	C-1
	CLO-2	Able to describe process of internal and external origin, properties of rocks and aggregates.	Engineering Knowledge	C-2
	CLO-3	Able to recognize minerals, rocks and geological structures and processes.	Investigation	S-1
	Law and Regulatory Control Studies (UE-218)			
	CLO-1	Able to describe the law and rights for owning the property.	The Engineer and Society	C-2

	CLO-2	Able to prepare and share documents for project submission plans with considering by-laws non-violations.	Communication	C-3
	CLO-3	Able to discuss the professional and ethical obligations for managing work at site.	Ethics	C-2
5 Fall	Civil Works Quantity & Cost Estimations (UE-321)			
	CLO-1	Able to describe basic concepts of quantity surveying and cost estimation for the preparation of cost estimates of construction projects.	Engineering Knowledge	C-2
	CLO-2	Able to calculate civil works quantities and prepare BOQs, tender documents and contracts for civil engineering projects with consideration of estimating project budget and cost.	Problem Analysis	C-3
	CLO-3	Able to demonstrate basic quantity estimation manually and through software.	Modern Tool Usage	S-4
	Traffic Engineering and Management (UE-316)			
	CLO-1	Ability to apply methods for investigation of traffic related problems and evaluation of existing traffic conditions.	Investigation	C-3
	CLO-2	Ability to develop plans for improved traffic operations and management.	Design/Development of Solutions	C-4
	CLO-3	Able to collect, analyze and present the traffic data.	The Engineer and Society	S-3
	Principles of Engineering Construction (UE-322)			
	CLO-1	Ability to analyse project management aspects related to building delivery process.	Project Management	C-4
	CLO-2	Ability to apply understanding of construction aspects related to earthworks and substructure elements.	Engineering Knowledge	C-4

	CLO-3	Ability to apply understanding of construction aspects related to superstructure element and non-structural elements.	Engineering Knowledge	C-4
	Reinforced Concrete Design (UE-304)			
	CLO-1	Able to comprehend principles of reinforced concrete design based on codes and standards.	Engineering Knowledge	C-2
	CLO-2	Able to investigate reinforced concrete members based on codes and standards.	Investigation	C-3
	CLO-3	Able to design reinforced concrete members based on codes and standards.	Design/Development of Solutions	C-5
6 Spring	Soil Mechanics-I (UE-305)			
	CLO-1	Able to use properties of soil and to identify the soil based on soil classification system.	Engineering Knowledge	C-3
	CLO-2	Able to determine strength, stresses and effect of water, compaction and consolidation on soil.	Problem Analysis	C-3
	CLO-3	Able to perform and investigate the lab and field tests of soil for the construction of safer infrastructure.	Investigation	S-3
	Structural Analysis and Design (UE-306)			
	CLO-1	Able to analyse the structural elements of superstructure and substructure subjected to different loads including wind and earth quake loads.	Problem Analysis	C-4
	CLO-2	Able to design the structural elements of superstructure and substructure.	Design/Development of Solutions	C-5
	CLO-3	Able to use learning for the investigation of prestressed members.	Lifelong Learning	C-3
	Introduction to Geo-Informatics (UE-217)			
	CLO-1	Able to describe the fundamental principles of Geo-informatics.	Engineering Knowledge	C-2

	CLO-2	Able to describe and handle spatial data and Geo-processing.	Modern Tool Usage	C-2 S-3
	Environmental Engineering - I (EN-301)			
	CLO-1	Describe environmental pollution.	Environmental Sustainability	C-2
	CLO-2	Design of water treatment system.	Design/Development of Solutions	C-6
	CLO-3	Detect concentration of pollutants in environmental samples.	Investigation	P-1
	Urban Hydrology and Municipal Engineering (UE-323)			
	CLO-1	Able to describe various components of hydrological cycle for a catchment area.	Engineering Knowledge	C-2
	CLO-2	Able to solve problems related to Urban Storm Water System and to carry out design of services.	Problem Analysis	C-3
	CLO-3	Able to locate and apply Knowledge of Municipal Engineering and concepts of land development process.	Investigation	S-2
7 Fall	Soil Mechanics-II (UE-403)			
	CLO-1	Able to illustrate soil investigation methods, prepare bore log, determine soil settlement and bearing capacity.	Problem Analysis	C-3
	CLO-2	Able to analyse stability of retaining structures and slopes based on standard theories and methods.	Design/Development of Solutions	C-4
	CLO-3	Able to conduct laboratory based experiment and perform soil investigation in the lab and in the field.	Investigation	S-3
	Environmental Engineering - II (EN-401)			
	CLO-1	Discuss recycling and its environmental impacts.	Environmental and sustainability	C-1
	CLO-2	Design waste water treatment and disposal system.	Design/Development of Solutions	C-4

	CLO-3	Explain elements of solid waste management systems.	The Engineer and Society	C-2
	Hydraulic Engineering and Water Resources Management (UE-418)			
	CLO-1	Able to describe hydrology, hydraulics, irrigation and drainage concepts.	Engineering Knowledge	C-2
	CLO-2	Able to analyze the water resources system for water-use and water-control.	Problem Analysis	C-4
	CLO-3	Able to calibrate and measure basic parameters of hydrology and hydraulic processes.	Investigation	S-4
	Construction Planning & Management (UE-405)			
	CLO-1	Able to describe basic construction management principles.	Project Management	C-2
	CLO-2	Able to apply time and cost management principles on a construction project.	Project Management	C-3
	CLO-3	Able to discuss ethics of contracts of construction projects.	Ethics	C-2
	Advanced Technologies and Disaster Management (UE-407)			
	CLO-1	Able to describe the significance of sustainable materials in infrastructures and able to discuss the strengthening techniques.	Environmental and sustainability	C-2
	CLO-2	Able to explain innovative technologies for construction.	Lifelong Learning	C-2
	CLO-3	Able to analyze natural hazards and their associated risk manually and through modern tools.	Modern tool usage	C-4
8 Spring	Mechanics and Design of Steel Structures (UE-413)			
	CLO-1	Able to apply the elementary theory of elasticity, plasticity, theories of failure for isotropic materials.	Engineering Knowledge	C-3
	CLO-2	Able to analyze steel structural members in tension, compression and flexure.	Problem Analysis	C-4

	CLO-3	Able to design steel structural members in tension, compression, flexure and bolted & welded simple connections.	Design/Development of Solutions	C-5
Urban Mass Transportation (UE-402)				
	CLO-1	Able to comprehend needs and significance of public mass transportation in local and international context.	Lifelong Learning	C-2
	CLO-2	Able to collect travel data, investigate travel patterns and develop transportation demand models.	Investigation	C-3
	CLO-3	Able to develop plan for improved operations and management of public transportation systems.	Design/Development of Solutions	C-4
Financial Resource Management (CF-410)				
	CLO-1	An ability to identify and analyze the options in obtaining the requisite finance to fund the projects	Engineering Knowledge	C-2
	CLO-2	An aptitude to prepare financial statements of any project and to analyze prospective investment in projects.	Project Management	C-3
	CLO-3	Capability to apply for Consumer Credits; and loans and practice the rules regarding exchange rates.	Development of Solutions	C-3
Environmental Impact Assessment (EN-402)				
	CLO-1	Able to describe the environmental pollutants.	Environment and Sustainability	C-2
	CLO-2	Able to interpret and analyse the environmental adverse impacts and their mitigation.	Design/Development of Solutions	C-4
	CLO-3	Able to analyze environmental impacts of a project based on SEPA 2014 and EIA/IEE regulation 2014.	The Engineer and Society	C-4
Additional Courses	Reinforced Concrete Design-II (UE-453)			
	CLO-1	DESIGN of RC elements of superstructure.	Design/Development of Solutions	C-6

	CLO-2	DESIGN of foundations substructure elements.	Design/Development of Solutions	C-6
	CLO-3	DESIGN of prestressed concrete members.	Design/Development of Solutions	C-2
Structural Analysis -II (UE-359)				
	CLO-1	ANALYZE Statistically Indeterminate Structures using Classical Methods.	Problem Analysis	C-4
	CLO-2	ANALYZE statistically indeterminate structures using matrix method.	Problem Analysis	C-4
Mechanics of Solids-II (UE-360)				
	CLO-1	ANALYZE beams subjected to unsymmetrical bending, curved beams and beams on elastic foundations.	Problem Analysis	C-4
	CLO-2	APPLY of theory of elasticity under generalized loading.	Problem Analysis	C-3
	CLO-3	DISCUSS theory of plasticity and plastic analysis of beams and frames.	Problem Analysis	C-2