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"অনুসন্ধান কলি"

Syllabus .

B.Sc. Engineering Course Calendar
Academic Session: 2014 - 2015

Department of Civil Engineering
Sylhet Engineering College
Sylhet, Bangladesh

This Booklet is only for -

2014 - 2015

2015 - 2016

2016 - 2017

2017 - 2018

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COURSE REQUIREMENTS FOR UNDERGRADUATE CIVIL ENGINEERING STUDENTS

Undergraduate students of the Department of Civil Engineering have to follow a particular course schedule which is given in this chapter according to semester wise distribution of the course:

First Year: Semester I

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 101	Engineering Mechanics-I	2		2
2	MATH 103	Differential Calculus, Integral Calculus & Matrices	3		3
3	CHEM 101	Chemistry I	3		3
4	PHY 103	Physics- I (physical optics, heat, waves and oscillation)	3		3
5	ENG 101	English I	2		2
6	SS 103	Economics	2		2
7	SS 105	Sociology & Industrial Law	2		2
8	CE 100	Civil Engineering Drawing		3	1.5 ✓
9	PHY 104	Physics Sessional		3	1.5
Total					20.0

First Year: Semester II

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 201	Engineering Mechanics-II	2		2
2	CE 203	Surveying	3		3
3	PHY 201	Physics II (Structure of matter, Electricity and magnetism and Modern physics)	2		2
4	CHEM 203	Chemistry II	2		2
5	MATH 203	Differential Equation, Definition Partial Differential Equation & Three Dimensional Co-ordinate Geometry	3		3
6	EEE 211	Basic Electrical Technology	3		3
7	CE 200	Computer Aided Drawing		3	1.5
8	CHEM 204	Chemistry Sessional		3	1.5
9	ENG 202	Communication in English (Practice)		2	1.0
10	EEE 212	Electrical Technology Lab		3	1.5
Total					20.5

CE 101
SS 103
PHY 103
CHEM 203
MATH 203
ENG 101
CE 100
PHY 104

Second Year: Semester I

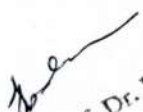
SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 305	Mechanics of Solids I	3		3
2	CE 307	Engineering Materials	3		3
3	CE 309	Numerical Analysis	2		2
4	MATH 303	Vector Analysis, Laplace transforms, Fourier Analysis & Harmonic Functions	3		3
5	SS 301	Principles of Accounting	2		2
6	CE 300	Details of Construction		3	1.5
7	CE 306	Mechanics of Solids Sessional		3	1.5
8	CE 304	Practical Surveying (Field work)		8 days	1.5
9	ME 302	Carpentry Shop, Machine shop and Welding shop sessional		3	1.5
10	CE 308	Engineering Materials Sessional		3	1.5
Total					20.5

Second Year: Semester II

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 405	Mechanics of Solids II	3		3
2	CE 461	Fluid Mechanics	3		3
3	CE 463	Hydrology	2		2
4	CE 481	Engineering Geology & Geomorphology	2		2
5	CSE 411	Introduction to Computer Language	2		2
	SS 403	Statistics	2		2
6	CE 450	Remote Sensing and GIS		3	1.5
7	CE 462	Fluid Mechanics Sessional		3	1.5
8	CSE 412	Computer Programming Sessional		3	1.5
9	CE 410	Quantity Surveying		3	1.5
Total					20.0

Third Year: Semester I

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 511	Structural Analysis I	3		3
2	CE 523	Reinforced Concrete Design I	3		3
3	CE 531	Environmental Engineering I	2		2
4	CE 541	Geotechnical Engineering I	3		3
	CE 565	Open Channel Flow	3		3
5	CE 580	Plumbing for Water Supply and Sewerage System		3	1.5
7	CE 524	Reinforced Concrete Design Sessional I		3	1.5
8	CE 532	Environmental Engineering Sessional I		3	1.5
9	CE 542	Geotechnical Engineering Sessional I		3	1.5
Total					20.0


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Third Year: Semester II

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 613	Structural Analysis II	2		2
2	CE 625	Reinforced Concrete Design II	3		3
3	CE 669	Hydraulics and Hydraulic Structures	3		3
4	CE 643	Geotechnical Engineering II	3		3
5	CE 683	Project Planning & Management	2		2
6	CE 651	Transportation Engineering I	3		3
7	CE 612	Structural Analysis & Design Sessional I		3	1.5
8	CE 652	Transportation Engineering Sessional I		3	1.5
9	CE 662	Open Channel Flow Sessional		3	1.5
Total					20.5

Fourth Year: Semester I

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit
			T	P	
1	CE 715	Structural Analysis III	2		2
2	CE 717	Steel Structure	2		2
3	CE 733	Environmental Engineering II	2		2
4	CE 753	Transportation Engineering II	3		3
5	CE 767	Irrigation and Flood Control	2		2
6	CE 785	Fundamental of Earthquake Engineering	2		2
7	CE 726	Reinforced Concrete Design Sessional II		3	1.5
8	CE 714	Structural Analysis & Design Sessional II		3	1.5
9	CE 768	Irrigation and Flood Control Sessional		3	1.5
10	CE 700	*Project / Thesis		3	1.5
Total					19.0

*To register in division of major and minor specialization from Structural, Environmental, Geotechnical, Transportation, and Water Resources Engineering.


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Fourth Year: Semester II

SL. No.	Course Code	Course Title	Contact Hrs/Week		Credit	Selection
			T	P		
For All Specialization						
1	CE 800	Project / Thesis	6		3	Compulsory
2	CE 887	Professional Practices & Communication	2		2	Any One
	CE 889	Socio-economic Aspects of Development Projects				
Specialization: Structure						
3&4 / 5/6/7	CE 821	Theory of Elasticity and Elastic Instability of Structures	2 * 2		2*2	Any Two
	CE 827	Pre-stressed Concrete				
	CE 819	Dynamics of Structures				
8/9/10	CE 816	Structural Analysis & Design Sessional III		3	1.5	Compulsory
Specialization: Environment						
3&4 / 5/6/7	CE 835	Environmental Engineering III	2 * 2		2 * 2	Any Two
	CE 837	Environmental Engineering IV				
	CE 839	Environmental Engineering V				
	CE 829	Urban and Regional Planning				
8/9/10	CE 832	Environmental Engineering Sessional II		3	1.5	Compulsory
Specialization: Geotechnical						
3&4 / 5/6/7	CE 845	Geotechnical Engineering III	2 * 2		2 * 2	Any Two
	CE 847	Geotechnical Engineering IV				
	CE 849	Geotechnical Engineering V				
8/9/10	CE 844	Geotechnical Engineering Sessional II		3	1.5	Compulsory
Specialization: Transportation						
3&4 / 5/6/7	CE 855	Transportation Engineering III	2 * 2		2 * 2	Any Two
	CE 857	Transportation Engineering IV				
	CE 859	Transportation Engineering V				
8/9/10	CE 854	Transportation Engineering Sessional II		3	1.5	Compulsory
Specialization: Water Resources						
3&4 / 5/6/7	CE 871	Groundwater Engineering	2 * 2		2 * 2	Any Two
	CE 873	River Engineering				
	CE 875	Coastal Engineering				
8/9/10	CE 872	Water Resources Engineering Sessional		3	1.5	Compulsory
Total					19.5	

Student should take two theory courses and one sessional course from his /her thesis related field (major specialization).

Student should take three theory courses and two sessional courses from other specialization field (minor).

NB: Every student should have to complete 160.00 credits for obtaining the B.Sc. Engineering degree in Civil Engineering.

Handwritten: All students should finish all ^{open} laboratories / ^{sessional courses} training courses.

* Summary:

Theory Courses 1/6
Sessional " 1/1

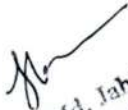
Training / project 1/1

Basic Science 1/1

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* Prerequisite courses ~~at~~ must be identified

Semester	Hours/Week		Credits	Pre-requisite
	Theory	Sessional		
First Year: Semester I	17	6	20.0	
First Year: Semester II	15	11	20.5	
Second Year: Semester I	13	12	20.5	
Second Year: Semester II	14	12	20.0	
Third Year: Semester I	14	12	20.0	
Third Year: Semester II	16	9	20.5	
Fourth Year: Semester I	13	12	19.0	
Fourth Year: Semester II	12	15	19.5	
	114	89	160.0	


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Detailed outline of undergraduate courses offered by the department of Civil Engineering

First Year: Semester I

CE 101: Engineering Mechanics I

2.00 credit, 2 hrs/week.

Introduction to SI Units, resultants and components of forces, coplanar concurrent forces, moments and parallel coplanar forces, non-concurrent non-parallel coplanar forces, maximum and minimum forces; non-coplanar forces, centroids, moment of inertia of areas, moment of inertia of masses.

MATH 103: Differential Calculus, Integral Calculus & Matrices

3.00 Credit, 3 hrs/week.

Differential Calculus: Limit, Continuity and differentiability. n -th derivatives of standard functions. Leibniz's theorem. Rolle's theorem, Mean value theorem. Expansion in finite and infinite forms. Indeterminate form. Partial differentiation. Euler's theorem. Tangent and Normal. Subtangent and subnormal in partial and polar co-ordinates. Maxima and minima of functions of single variables. Curvature.

Integral Calculus: Integration by parts. Standard integrals. Integration by the method of successive reduction. Definite integrals. Improper integrals. Beta function. Gamma function. Multiple integrals. Area, Volume of solids of revolution.

Matrices: Definition of matrix. Algebra of matrices. Multiplication of matrices. Transpose of a matrix and inverse of matrix. Rank and elementary transformation of matrices. Solution of linear equations. Linear dependence and independence of vector. Quadratic forms. Matrix polynomials. Determination of characteristic roots and vectors. Null space and nullity of matrix. Characteristic subspace of matrix.

CHEM 101: Chemistry - I

3.00 Credit, 3 hrs/week.

Atomic structure, periodic table, chemical bonds. Chemistry of cement, silicates and limes. Physical and chemical properties of water.

Different types of solutions, concentration units. Chemical equilibria and thermochemistry.

PHY 103: Physics- I (physical optics, heat, waves and oscillation)

3.00 Credit, 3 hrs/week

Physical Optics: Theories of light: Huygen's principle and construction. Interference of light: Young's double slit experiment, Fresnel bi-prism, Newton's rings, interferometers. Diffraction of light: Fresnel and Fraunhofer diffraction, diffraction by single slit, diffraction by double slit,


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diffraction gratings, polarization, production and analysis of polarized light, optical activity, optics of crystals.

Heat and Thermodynamics: Temperature, zeroth law of thermodynamics. Thermometers: constant volume, platinum resistance, thermocouple. First law of thermodynamics and its application, molar specific heats of gases, isothermal and adiabatic relations, work done by a gas. Kinetic theory of gases: explanation of gas laws, kinetic interpretation of temperature, equipartition of energy and calculation of ratio of specific heats, mean free path, Vander Waals equation of state, second law of thermodynamics: reversible and irreversible processes, Carnot cycle, efficiency, Carnot's theorem, entropy.

Waves and Oscillations: Simple harmonic motion, damped simple harmonic oscillations, forced oscillations, resonance, vibrations of membranes and columns. Combination and composition of simple harmonic motions, Lissajous figures. Transverse and longitudinal nature of waves, travelling and standing waves, intensity of a wave, energy calculation of progressive and stationary waves, phase velocity, group velocity. Sound waves: velocity of longitudinal wave in a gaseous medium. Doppler effect. architectural acoustics: Sabine's formula, requisites of a good auditorium.

ENG 101: English-I

2 Credit, 2 hrs/week

English phonetics: the places and manners of articulation of the English sounds; Vocabulary; English grammar; construction of sentences, some grammatical problem; Comprehension; Paragraph writing; Précis writing; Amplification; Report writing; Business communication and tenders; Short stories written by some well-known classic writers.

SS 101 : Economics

2.00 Credit, 2 hrs/week.

Definition of Economics. Economics and Engineering. Principles of Economics.

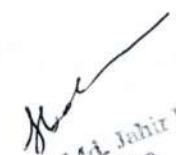
Micro economics: The theory of demand and supply and their elasticities. Price determination. Nature of an economic theory, applicability of economic theories to the problems of developing countries. Indifference curve technique. Marginal analysis. Optimization. Market. Production, Production function, types of productivity. Rational region of production of an engineering firm. The Short run and the Long run. Fixed cost and variable cost. Internal and external economics and diseconomies.

Macro - economics: Savings, investment. National income analysis. Inflation. Monetary policy, Fiscal policy and Trade policy with reference to Bangladesh. Planning in Bangladesh.

SS 101: Sociology & Industrial Law

2.00 Credit, 2 hrs/week.

Scope, some Basic Concepts. Social evolution and techniques of production. culture and civilization. Social structure of Bangladesh. Population and world resources. Oriental and Occidental societies, Industrial revolution. Family urbanization and industrialization, Urban Ecology, Co-operative and Socialist movements. Rural Sociology.


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CE 100: Civil Engineering Drawing

1.50 credit, 3 hrs/week.

Introduction - Lines and lettering, Plane geometry: drawing of linear and curved geometric figures. e.g. pentagon, hexagon, octagon, ellipse, parabola, hyperbola. Solid geometry: Projections of cube, prism, cone, cylinder, developments, true shapes and sections of cube, pyramid, cone, prism, isometric and oblique drawings of cube, pyramid, cone. Plan, elevations and sections of one storied buildings and bridges.

PHY 104: Physics Sessional.

1.50 Credit, 3 hrs/week.

Determination of the specific heat of a liquid by the method of cooling. Determination of the thermal conductivity of a bad conductor by Lee's method. Determination of the pressure coefficient of air by constant volume air thermometer. Determination of the frequency of a tuning fork by Melde's apparatus. Determination of the focal length of concave lens by auxiliary lens method. Measurement of unknown resistance and verification of the laws of resistance by P.O. (Post Office) box. Comparison of the E.M.Fs of two cells by potentiometer. Determination of the mechanical equivalent of heat by electrical method. Determination of the radius of curvature of a plano-convex lens by Newton's ring method. Determination of threshold frequency for the photoelectric effect of a photocathode and the value of the Planck's constant. To plot thermo-electromotive force-temperature (calibration) curve for a given thermocouple. Determination of the melting point of a solid using the calibration curve. Determination of the specific rotation of sugar solution by a polarimeter. Determination of the temperature coefficient of the resistance of the material of a wire. Determination of the refractive index of the material of a prism using spectrometer. Determination of the spring constant and the effective mass of a loaded spring.


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First Year: Semester II

CE 201 : Engineering Mechanics II

2.00 credit, 2 hrs/week.

Friction, flexible cords, graphical methods, plane motion, force systems that produce rectilinear motion, work, kinetic energy; power, impulse and momentum.

CE 203 : Engineering Materials

3.00 credit, 3 hrs/week.

Introduction: Importance and functional impact of engineering materials in the point of view of environmental engineering; Basic civil engineering materials: Properties and uses of Bricks, Cement, Aggregates, Cement and lime mortars, Concrete, Stone, Sand and Fineness modulus; Concrete: Constituent of Concrete; Properties of Concrete; Design of Concrete mix; Glass: Nature, forms and types of glasses; Timber: Nature, forms and types of timber and classification; Plastics: Fundamental characteristics, classification, some typical examples of plastics and their uses; Rubber: sources of natural rubber, chemical treatment of latex, raw materials, synthetic reactions and properties of synthetic rubber; Corrosion: Nature, Forms and types of corrosion, electrochemical mechanism and prevention of corrosion. Paints, varnishes and metallic coatings, methods used in applying coatings on metal surface; Atomic structure and bonding: Yielding, Fractures and Elasticity.

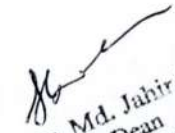
PHY 201: Physics II (Structure of matter, Electricity and magnetism and Modern physics)

2.00 Credit, 2 hrs/week.

Structure Matter: States of matter: solid, liquid and gas. Classification of solids: amorphous, crystalline, ceramics and polymers. Atomic arrangement in solids. Different types of bonds in solids: metallic, Vander Waals, covalent and ionic bond, packing in solids, interatomic distances and forces of equilibrium, x-ray diffraction; Bragg's law. Plasticity and elasticity. Distinction between metal, insulator and semi-conductor.

Electricity and Magnetism: Electric charge, Coulomb's law. the electric field: calculation of the electric field strength, E ; a dipole in an electric field, electric flux and Gauss's law, some application of Gauss's law; electric potential V , relation between E and V , electric potential energy. Capacitors; capacitance, dielectrics: an atomic view, dielectrics and Gauss's law; current and resistance: current and current density, Ohm's law, resistivity: an atomic view, Ampere's law, Faraday's law, Lenz's law, self inductance and mutual inductance. Magnetic properties of matter: magnetomotive force, magnetic field intensity, permeability, susceptibility, classifications of magnetic materials, magnetisation curves.

Modern Physics. Michelson Morley's experiment, Galilean transformation, special theory of relativity, Lorentz-transformation, relative velocity, length contraction, time dilation, mass-energy relation. Photo-electric effect, Compton effect, de-Broglie wave, Bohr's atom model. Radioactive decay, half life, mean life, isotopes, nuclear binding energy, alpha, beta, gamma decay.


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CHEM 203 : Chemistry-II

2.00 Credit Hours, 2 hrs/week.

Reactions kinetics: rate of chemical reactions; order and molecularity of reactions, different types of rate expressions, methods of determining rate and order, effect of temperature on reaction rate and energy of activation.

Colloid and colloidal solution: classification, preparation, purification, properties, protective action and application of colloids.

Chemical corrosion: introduction to chemical corrosion, corrosion of metals and alloys in dry and wet environments, mechanism of corrosion, atmospheric and soil corrosion and their protective measures.

Chemistry of environmental pollution: environment and its characteristics, chemistry of toxic metal and non-metal pollutants, analytical techniques used in the determination of pollutants, chemical concept of DO, BOD, COD and threshold odor number, chemistry involved in water treatment plants, quality of industrial waste water.

Polymers: chemistry of polymerization, different types of polymers and their properties, polymer degradation, elastomers and composite materials.

Paints and varnishes: introduction to paints and varnishes, pretreatment of the surface, metallic, non-metallic and organic protective coating, types of paints and their uses.

MATH 203: Differential Equation, Definition Partial Differential Equation & Three Dimensional Co-ordinate Geometry

3.00 Credit, 3 hrs/week.

Differential Equation: Definition. Formation of differential equations. Solution of first order differential equations by various methods. Solution of differential equation of first order and higher degrees. Solution general linear equations of second and higher orders with constant co-efficient. Solution of Euler's homogeneous linear equations. Solution of differential equations in series by the method of Frobenius. Bessel's functions, Legendre's polynomials and their properties.

Partial Differential Equation: Introduction. Equations of the linear and non-linear first order. Standard forms. Linear equations of higher order. Equations of the second order with variable co-efficient.

Three Dimensional Co-ordinate Geometry: System of co-ordinates. Projection. Direction Cosines. Equations of planes and lines. Angle between lines and planes. Distance from a point to a plane. Co-planar lines. Shortest distance between two given straight lines. Standard equation of conicoids; sphere ellipsoid. Hyperboloid of one sheet, hyperboloid of two sheets. Tangent planes. Normal lines. Condition of tangency.

EEE 211 : Basic Electrical Technology

3.00 Credit, 3 hrs/week.

Electrical units and standards, Electrical network and circuit solution series, parallel and mesh current methods. Instantaneous current, voltage and power, effective current and voltage, average power. Sinusoidal single phase RLC circuits: phasor algebra, balanced three phase circuits. Electrical wiring for residential and commercial loads. Introduction to transformers and induction motors.


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CE 200 : Computer Aided Drawing

1.50 credit, 3 hrs/week.

Introduction to computer usage. Introduction to CAD packages and computer aided drafting: drawing editing and dimensioning of simple objects. Plan, elevations and sections of multi-storied buildings; reinforcement details of beams, slabs, stairs etc. Plan and section of septic tank, Detailed drawings of roof trusses, Plans, elevations and sections of culverts, bridges and other hydraulic structures, Building services drawings.

CHEM 204 : Chemistry Sessional

1.5 Credit, 3 hrs/week.

Volumetric analysis: acid-base titration, oxidation-reduction titrations, determination of Fe, Cu and Ca volumetrically.

ENG 202: Communication in English (Practice)

1 Credit, 2 hrs/week.

Grammar: Tense, article, preposition, subject-verb agreement, clause, conditional and sentence structure.

Vocabulary building: Correct and precise diction, affixes, level of appropriateness, Colloquial and standard informal and formal.

Developing writing skill: Sentences, sentence variety, generating sentences; clarity and correctness of sentences, linking sentences to form paragraphs, writing paragraphs, essays, reports and formal & informal letters.

Listening skill and note taking: Listening to recorded text and class lectures and learning to take useful notes based on listening.

Developing speaking skill: Oral skills including communicative expressions for personal identification, life at home, giving advice and opinion, instruction and directions, requests, complaints, apologies, describing people and places, narrating events.

EEE 212 : Electrical Technology Lab.

1.50 credit, 3 hrs/week.

Laboratory experiments based on EEE 165.

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Second Year: Semester I

CE 305 : Mechanics of Solids I

3.00 credit, 3 hrs/week.

Fundamental concepts of stress and strain. Mechanical properties of materials, strain energy, stresses and strains in members subjected to tension, compression, shear and temperature changes, bending moment and shear force diagrams of beams and frames, flexural and shearing stresses in beams, shear centre, thin walled pressure containers, rivetted and welded joints.

CE 307 : Surveying

3.00 credit, 3 hrs/week.

Introduction: Calculation of area and volumes; Survey: chain; traverse, Plane table; Leveling; Tachometry; Principles and problems on Tachometry; Curves and Curve ranging; Transition curve; Vertical curves; Introduction of Geodetic surveying. Project surveying; Errors in surveying; Field procedure, Correction for base line, Problems on geodetic surveying; Introduction of photogrammetry, Terrestrial photography; aerial photography; Meteorology; General Meteorology, Agricultural and Forest Meteorology. Enhancement Total station equipment handling and global position station (GPS)

CE 309 : Numerical Analysis

2.00 credit, 2 hrs/week.

Numerical solution of algebraic and transcendental equations; solution of systems of linear equations; linear and non-linear curve-fitting by least square regression; finite differences; divided differences; interpolation; numerical differentiation and integration; numerical solution of differential equations.

MATH 303: Vector Analysis, Laplace transforms, Fourier Analysis & Harmonic Functions

3.00 Credit, 3 hrs/week.

Vector Analysis: Scalars and vectors, equality of vectors. Addition and subtraction of vectors. Multiplication of vectors by scalars. Position vector of a point. Resolution of vectors. Scalar and vector product of two vectors and their geometrical interpretation. Triple products and multiple products. Application to geometry and mechanics. Linear dependence and independence of vectors. Differentiation and integration of vectors together with elementary applications. Definition of line, surface and volume integral. Gradient, divergence and curl of point functions. Various formulae. Gauss's theorem, stoke's theorem, Green's theorem and their applications.

Laplace transforms: definition of Laplace transforms, sufficient conditions for existence of Laplace transforms; inverse Laplace transforms; Laplace transforms of derivatives; the unit step function; periodic function; some special theorems on Laplace transforms; partial fraction; solutions of differential equations by Laplace transforms.

Fourier Analysis: Fourier series, convergence of Fourier series; Fourier integral; Fourier transforms and their applications.


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Harmonic Functions: Definition of harmonic function; Laplace equation in Cartesian, polar, cylindrical and spherical coordinates, solutions of these equations with applications; Properties of harmonic functions.

SS 301: Principles of Accounting

2.00 Credit, 2 hrs/week.

Principles of accounting: accounts, transactions, the accounting procedures and financial statements. Cost in general: objectives and classifications. Overhead costing. Cost sheet under job costing operating costing and process costing. Marginal costing: tools and techniques, cost-volume-profit analysis. Relevant costing: analyzing the profitability within the firm, guidelines for decision making. Long-run planning and control: capital budgeting.

CE 300 : Details of Constructions

1.50 credit, 3 hrs/week.

Foundations, different types of foundations, brick masonry, framed structures and bearing walls; arches and lintels, details of floors and roofs, pointing, plastering and interior finishing, scaffolding, staging, shoring and underpinning, thermal insulation and acoustics, House plumbing.

CE 306 : Mechanics of Solids Sessional

1.50 credit, 3 hrs/week.

Tension, direct shear and impact tests of mild steel specimen, compression test of timber specimen, slender column test, static bending test, hardness test of metals, helical spring tests, determination of shear centre, load-deflection behavior of simple beam.

CE 304 : Practical Surveying

1.50 credit, 3 hrs/week.

Chain survey, Plane table survey, Traverse survey, Leveling and contouring, Route project, Tachometry and Stadia surveying, Height and Distance problem, House setting, Curve setting, Use of Total Station and Global Position Station (GPS)

ME 302 : Carpentry shop, Machine shop and Welding shop sessional

1.50 Credit, 2 hrs/week.

Wood working tools: Wood working machine: Band saw, scroll saw, circular saw, jointer, thickness planer, disc sander, weed lathe; Types of sawing; Common cuts in wood works; Types of joint; Defects of timber: Natural defects and artificial defects; seasoning; Preservation; Substitute of timber; Commercial forms of timber. Characteristics of good timber; Use of fastening; Shop practice: Practical job, planning and estimating of a given job.


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Machine shop (3/4 hrs/week)

Kinds of tools: Common bench and hand tools: Marking and layout tools, measuring tools, cutting tools, machine tools, bench work with job. Drilling, Shaper, Lathe and Milling Machines: Introduction, type, size and capacity, uses and applications.

Welding shop (3/4 hrs/week)

Methods of metal joints: Riveting, grooving soldering, welding; Types of welding joints and welding Practice; of arc welding and polarity: Flat, vertical, horizontal, overhead; Electric Arc welding and its machineries; Welding of different types of materials: Low carbon steel, cast iron, brass, copper, stainless steel, aluminum; Types of electrode, fluxes and their composition; Arc welding defects; Test of Arc welding: Visual, destructive and non-destructive tests.

Types of gas welding system and gas welding equipment: Gases and types of flame; welding of different types of materials; Gas welding defects; test of gas welding.

CE 308 : Engineering Material Sessional

1.50 credit, 3 hrs/week.

General discussion on preparation and properties of concrete. Test for specific gravity. Unit weight, voids and bulking of aggregates moisture content and absorption of coarse and fine aggregates; normal consistency and initial setting time of cement, direct tensile and compressive strengths of cement mortar, gradation of coarse and fine aggregates, design and testing of a concrete mix.


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Second Year: Semester II

CE 405 : Mechanics of Solids II

3.00 credit, 3 hrs/week.

Deflection of beams: Integration and moment area methods; Torsion; Helical springs; principal stress; Mohr's Circle; Columns; Euler's formula; Intermediate column formulas; the secant formula; Flesure formula of curved beams; Truss; Joint method section method.

CE 461: Fluid Mechanics

3.00 Credit, 3 hrs/week.

Development and scope of fluid mechanics. Fluid properties. Fluid statics. Kinematics of fluid flow. Fluid flow concepts and basic equations continuity equation, Bernoulli's equation, energy equation, momentum equation and forces in fluid flow. Similitude and dimensional analysis. Steady incompressible flow in pressure conduits, laminar and turbulent flow, general equation for fluid friction. Empirical equations for pipe flow. Minor losses in pipe flow. Fluid measurement: Pitot tube, orifice, mouthpiece, nozzle, venturimeter, weir. Pipe flow problems pipes in series and parallel, branching pipes, pipe networks.

CE 463: Hydrology

2.00 Credit, 2 hrs/week.

Hydrologic cycle. Weather and Hydrology. Precipitation, Evaporation and transpiration. Infiltration. Streamflow. Application of telemetry and remote sensing in hydrologic data acquisition. Rainfall runoff relations. Hydrographs, unit hydrographs. Hydrologic routing. Statistical methods in hydrology.

CE 481: Engineering Geology and Geomorphology

2.00 credit, 2 hrs/week.

Minerals, identification of minerals, common rock forming minerals, physical properties of minerals, mineraloids rocks, types of rocks, cycle of rock change, earthquake and seismic map of Bangladesh.

Structural geology, faults, types of faults, fold and fold type, domes, basins, erosional process, quantitative analysis of erosional land forms.

Channel development, channel widening, valley shape, stream terraces, alluvial flood plains, deltas and alluvial fans, channel morphology, channel patterns and the river basin, geology and geomorphology of Bangladesh.

CSE 411 : Introduction to Computer Language

2.00 credit, 2 hrs/week.

Computer Basics: Concept on Computer Hardware, Software and its classification, networking and Internet.

C-Language: Preliminaries, Program constructs variables and data types in C. Input and Output, Character and formatted I/O; Arithmetic Expression and Assignment statements; Loops


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and Nested Loops; Decision making; Arrays, Function; Arguments and local variables, calling functions and arrays, Recursion and recursive function; Structures within structure, files, file functions for sequential and Random I/O ; Pointers; Pointers and structures; Pointer and functions; Pointer and arrays; Operation and Pointer, Pointer and memory addresses; Operation on Bits; Bit Operation; Bit field; Advanced features; Standard and Library.

SS 403: Statistics

2.00 Credit, 2 hrs/week.

Statistics: Frequency distribution. Mean, median, mode and other measures of central tendency. Standard deviation and other measures of dispersion. Moments, skewness and kurtosis. Elementary probability theory and discontinuous probability distribution, e.g. binomial, poison and negative binomial. Continuous probability distributions, e.g. normal and exponential. Characteristics of distributions. Elementary sampling theory. Estimation. Hypothesis testing and regression analysis.

CE 450: Remote Sensing and GIS

1.5 Credit, 3 hrs/week.

Introduction to remote sensing and GIS, aerial photography, digital image processing, use of arc-views.

CE 462: Fluid Mechanics Sessional

1.5 Credit, 3 hrs/week.

Centre of pressure. Proof of Bernoulli's theorem. Flow through Venturimeter. Flow through orifice. Coefficient of velocity by coordinate method. Flow through mouthpiece. Flow over V notch. Flow over sharp crested weir. Fluid friction in pipe.

CSE 412 : Computer Programming Sessional

1.50 credit, 3 hrs/week.

Computer Basics: Student will learn the basic concept of Windows operating system, Word Processor software, spread sheet software and presentation software.

C-Language: Programming concepts and algorithms. Number systems, internal representation of data. Elements of structured programming language: data types, operators, expressions, control structures, functions, pointers and arrays, input and output. Concept of Object Oriented Programming (OOP): encapsulation, inheritance, polymorphism and abstraction. Template functions and classes. Development of programs related to Civil Engineering.

CE 410 : Quantity Surveying

1.50 credit, 3 hrs/week.

Quantity estimates of items of civil works e.g. building, bridge, truss and highway. Analysis of rates, detail estimate of all item of works of a building, use of software in quantity surveying; Specifications of materials of construction projects.


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Third Year: Semester I

CE 511: Structural Analysis I

3.00 credit, 3 hrs/week

Stability and determinacy of structures, analysis of statically determinate trusses and arches, influence lines, moving loads on beams, frames and trusses, cables and cable supported structures.

Wind and earthquake loads, approximate analysis of statically indeterminate structures. e.g. braced trusses, portal frames, mill bent and multi storied building frames, deflection of beams, trusses and frames by virtual work method, space trusses, analysis of statically indeterminate structures by consistent deformation.

CE 523: Reinforced Concrete Design I

3.00 credit, 3 hrs/week

Fundamental behavior of reinforced concrete; introduction to WSD and USD methods; analysis and /design of singly reinforced, doubly reinforced and T-beams according to WSD and USD methods; diagonal tension, bond and anchorage according to WSD and USD methods, one way slabs.

CE 531 : Environmental Engineering I

2.00 credit, 2 hrs/week

Water Supply Engineering: introduction, water demands, water supply sources, ground water exploration: aquifer properties and ground water flow, well hydraulics, water well design, drilling, construction and maintenance, water demand for rural communities, shallow hand tubewells and deep set Tara pumps for problem areas.

Surface water collection and transportation, head works, pumps and pumping machineries, water distribution system, analysis and design of distribution network, fire hydrants, water meters, leak detection, unaccounted for water.

Water quality requirements, water treatment - plain sedimentation, flocculation and settlement, filtration, disinfection, miscellaneous treatment methods, low cost treatment methods for rural communities.

CE 541 : Geotechnical Engineering I

3.00 credit, 3 hrs/week

Introduction to geotechnical engineering, formation, type and identification of soils, soil composition, soil structure and fabric, index properties of soils, engineering classification of soils, soil compaction, principles of total and effective stresses permeability and seepage, stress-strain-strength characteristics of soils, compressibility and settlement behavior of soils, lateral earth pressure, stress distribution.


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CE 665: Open Channel Flow

3.00 Credit, 3 hrs/week.

Open channel flow and its classification. Velocity and pressure distributions. Energy equation, specific energy and transition problems.

Critical flow and control. Principles of flow measurement and devices. Concept of uniform flow, Chezy and Manning equations, estimation of resistance coefficients and computation of uniform flow. Momentum equation and specific momentum. Hydraulic jump. Theory and analysis of gradually varied flow. Computation of flow profiles. Design of channels.

CE 580 : Plumbing for water supply and sewerage system

1.5 credit, 3 hrs/week

Water pipes and pipe fittings including valves, washouts, hydrants etc; pump and pumping machinery; Water distribution; Analysis and design of network; Pipe Sizing, Fire hydrant; Maintenance, monitoring and sanitary protection of water distribution systems, Leak detection and unaccounted water or system loss; Cost and billing of piped water supply; Water supply system in rural and urban areas. Analysis of building's planning system.

Sewerage and Waste Water Plumbing: Conventional sewerage system; small bore sewerage system; simplified sewer system; sewer and sewer materials, fittings and design; Hydraulics of sewer design; Construction of sewer; Sewer and sewer appurtenances, Maintenance of sewer and sewer appurtenances. Analysis of building's sewerage system & storm system.

CE 524 : Reinforced Concrete Design Sessional I

1.50 credit, 3 hrs/week.

Analysis and design problems based on CE515, design of a slab bridge, simple girder bridge and a low-rise building.

CE 532 : Environmental Engineering Sessional I

1.50 credit, 3 hrs/week.

Water and wastewater sampling techniques, sample preservation, physical, chemical and biological tests of water and wastewater, breakpoint chlorinating, alum coagulation, sampling and laboratory analysis of air, sampling and laboratory analysis of solid waste.

CE 542 : Geotechnical Engineering Sessional I

1.50 credit, 3 hrs/week.

Field identification tests, grain size analysis by sieve and hydrometer, specific gravity test, atterberg limits test, permeability tests, unconfined compression test, compaction test, relative density test, direct shear tests, consolidation tests.


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Third Year: Semester II

CE 613 : Structural Analysis II

2.00 credit, 2 hrs/week.

Analysis of statically indeterminate structures by displacement method, slope deflection, moment distribution, stiffness matrix, member stiffness, stiffness transformations, assembly of stiffness matrices and solution for beams, frames and trusses. Flexibility matrix. Influence lines for statically indeterminate beams, frames, arches and grids. Structural forms and their applications.

CE 625 : Reinforced Concrete Design II

3.00 credit, 3 hrs/week.

Two-way slabs, columns, footings, retaining walls, reinforced concrete floor and roof systems. Review of codes, yield line method, introduction of prestressed concrete. Analysis and preliminary design of prestressed beam section.

CE 669: Hydraulics and Hydraulic Structures

3.00 Credit, 3 hrs/week

Theories of Seepage; Embankment, Dam & design of Dam; Sluice gate; spillways; flood control reservoir, energy dissipater; diversion head work; irrigation structure; cross drainage works; regulator design; out falls; Gates; Cut off; Coastal structure, impact on coastal zone and force on coastal structure; Beach and port management; Sediment properties; Transport process; Along shore line sediment transport process, wind transport of sand; Management of coastal environment: Coastal water quality, Coastal water supply and sewage, Intrusion of saline water to estuary; Coast pollution; Preservation of coastal environment.

CE 643 : Geotechnical Engineering II

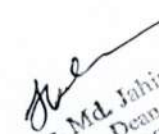
3.00 credit, 3 hrs/week.

Soil investigation techniques; settlement computation; types of foundations; bearing capacity of shallow and deep foundations; settlement and distortion of foundations; design and construction of footings, rafts and piles; slope stability analyses.

CE 651 : Transportation Engineering I

3.00 credit, 3 hrs/week

Introduction to transportation engineering, development of transportation systems, elements of transportation system, transportation in Bangladesh, modal share, transportation planning concepts: collection, study and analysis of basic data, highway location and surveys, geometric design of highways: elements of design, cross-section elements, curves and sight distances, road intersections, traffic engineering: the road/traffic system, vehicle and traffic characteristics, traffic control devices, traffic studies, parking and roadway lighting, waterways and terminals.


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CE 583 : Project Planning and Management

2.00 credit, 2 hrs/week

Principles of management, principles of construction management, construction contracts and specifications, inspection and quality control, construction safety, construction planning and scheduling: PERT, CPM, case studies, resource scheduling; PERT: a cost accounting system, linear programming. Psychology in administration, materials management, demand forecasting, inventory control, stores management, procurement. Project planning and evaluation, feasibility reports, cash flow, pay back period, internal rate of return. Benefit-cost ratio, construction equipments and plants. Replacement studies.

CE 612 : Structural Analysis and Design Sessional I

1.50 credit, 3 hrs/week

Analysis of steel structures e.g. truss, plate girder, design of members and joints of structures, use of software in analysis and design problems.

CE 652: Transportation Engineering Sessional I

1.50 credit, 3 hrs/week

Tests of bituminous materials, tests on subgrade, sub-base and base materials, bituminous mix design, roadway capacity analysis, application of analytical, simulation and statistical packages.

CE 662: Open Channel Flow Sessional

1.5 Credit, 3 hrs/week

Broad crested weir. Sluice gate. Venturi flume. Parshall flume. Cut throat flume. Hydraulic jump. Velocity distribution profile. Manning's roughness coefficient. Specific force and specific energy.


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Fourth Year: Semester I

CE 715 : Structural Analysis III

2.00 credit, 2 hrs/week

Introduction to finite element method as applied to Civil Engineering problems. One dimensional stress deformation and time dependent flow problem. Two dimensional plane stress and plane strain analysis of stress deformation problems.

CE 717: Steel Structure

2.00 credit, 2 hrs/week

Behavior of the structural steel members and frames, design of tension and compression members by ASD and LRFD methods, design of beams, columns and joints.

Behavioral principles and design of structural steel; design of tension members, bolted and welded connections; compression members; residual stress, local buckling, effective length; flexural members; lateral torsional buckling; design of beam-columns; connection design, moment connections, column bases; detailing of steel structures

CE 733 : Environmental Engineering II

2.00 credit, 2 hrs/week

Wastewater Engineering: introduction, water supply, sanitation and health, estimation of wastewater, wastewater collection systems, hydraulics of sewer, design, construction and maintenance of sanitary sewer and storm drainage system, sewer appurtenances, plumbing system.

Microbiology of sewage and waste water, wastewater characteristics, preparatory, primary and secondary treatment methods and disposal, treatment and disposal of industrial effluents, sludge treatment and disposal, sanitation for low income communities, on-site sanitation systems for rural communities, low cost small bore sewerage for small townships, design and construction of septic tanks, soak wells and subsurface drain fields, rural sanitation in Bangladesh.

Sustainability of water and sanitation services, participatory development approach in water and sanitation sector, community management of water and sanitation services, introduction to environment, environmental pollution, environment protection and management.

CE 753 : Transportation Engineering II

3.00 credit, 3 hrs/week

Highway materials, subgrade, subbase and base courses, soil stabilization and soil aggregates in road constructions, low-cost roads, production, properties and uses of bituminous materials and mix design methods, design, construction and maintenance of flexible and rigid road pavements, equipments, railways: general requirements, alignment, permanent way, station and yards, signalling, points and crossings, maintenance.


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CE 767: Irrigation and Flood Control

2.00 Credit, 2 hrs/week

Importance of irrigation. Sources and quality of irrigation water. Soil water relationship. Consumptive use and estimation of irrigation water requirements. Methods of irrigation. Design of irrigation canal system. Irrigation structures. Irrigation pumps. Problems of irrigated land. Flood and its control.

CE 785 : Fundamental of Earthquake Engineering

2.00 credit, 2 hrs/week.

Definition, causes and effects of earthquake, Measuring earthquakes, Predicting earthquakes. Earthquake loads; Earthquake ground motion and response spectra, Earthquakes in history, Seismic status of Bangladesh, Loss estimation due to damage of buildings, loss estimation due to damage of life lines (Electric power system, water and sewerage system, telecommunication system, traffic system) Design of structures considering earthquake loads.

CE 726 : Reinforced Concrete Design Sessional II

1.50 credit, 3 hrs/week.

Design of multistoried buildings considering wind and earthquake loads.

CE 714 : Structural Analysis and Design Sessional II

1.50 credit, 3 hrs/week

Design of various reinforced concrete structures, e.g. cantilever bridge and multistoried building.

CE 768: Irrigation and Flood Control Sessional

1.5 Credit, 3 hrs/week

Soil water relationship, soil properties, use of tensiometer, infiltration rate. Losses in irrigation system. Irrigation requirement and scheduling. Aquifer characteristics and estimation of yield from irrigation wells. Analysis of hydrologic data for irrigation and flood control. Design of irrigation and drainage canal network. Pumps in series and parallel. Pump characteristics. Flow through canal regulating structures.

CE 700: Project and Thesis

1.50 credit, 3 hrs/week

Experimental and theoretical investigation of various topics in structural engineering, concrete technology, environmental engineering, transportation engineering, geotechnical engineering, and Water Resources Engineering. Individual or group study of one or more topics from any of the above fields. The students will be required to submit thesis/project report at the end of the work.


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Fourth Year: Semester II

CE 800: Project and Thesis

3.0 credit, 6 hrs/week

Experimental and theoretical investigation of various topics in structural engineering, concrete technology, environmental engineering, transportation engineering, geotechnical engineering, and Water Resources Engineering. Individual or group study of one or more topics from any of the above fields. The students will be required to submit thesis/project report at the end of the work.

CE 887 : Professional Practices and Communication

2.00 credit, 2 hrs/week

The project cycle, project proposal, contractual provisions, techniques of specification writing, evaluation of bids, project evaluation.

Interpretation of literature, documents etc., communicating, preparation of report, industrial and labour relations, professional ethics in Civil Engineering.

CE 889: Socio-Economic Aspects of Development Projects

2.00 credit, 2 hrs/week

Economic and social structure, development and economic growth, socio-economic indicators, population, prosperity and poverty, employment of workforce, population displacement, rehabilitation strategy, productivity, landloss, landuse and land ownership patterns, fisheries and aquaculture, deforestation and afforestation, communication, commerce, industries and other economic benefits, water supply, sanitation, health and nutrition, inequalities in distribution of benefits and losses, socio-economic survey, case studies.

CE 821: Theory of Elasticity and Elastic Instability of Structures

2.00 credit, 2 hrs/week

Introduction to theory of elasticity, plane stress and plane strain conditions, Two-dimensional problems in rectangular and polar coordinates, torsion of circular and non-circular shafts, instability of structures, stability functions.

CE 827 : Prestressed Concrete

2.00 credit, 2 hrs/week

Prestressed concretes, materials, prestressing systems, loss of prestress, analysis of sections for flexure, shear, bond and bearing, beam deflections and cable layout, partial prestress.

Design of prestressed sections for flexure, shear, bond and bearing.


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CE 819: Dynamics of Structures

2.00 credit, 2 hrs/week

Formulation of equation of motion; free vibration response, SDOF and MDOF systems, response to harmonic and impulse loading and vibration analysis by Rayleighs method.

CE 816 : Structural Analysis & Design Sessional III (Computer Aided Analysis and Design of Structures) *1.50 credit, 3 hrs/week*

Use of structural analysis and design software; design of various reinforced concrete structures, e.g. building, water tower, folded plate roof.

Structural software development, Applications of the available structural software such as GEAR, GRASP, STAADPRO etc.

CE 835: Environmental Engineering III (Solid Waste Management)

2.00 credit, 2 hrs/week

Solid Waste Management: sources and types of solid wastes, physical and chemical properties of solid wastes, solid wastes generation, on-site handling, storage and processing, collection of solid wastes, transfer stations and transport, ultimate disposal methods, resources and energy recovery, soil pollution.

Industrial solid waste collection and disposal, hazardous waste management.

CE 837 : Environmental Engineering IV (Environmental Pollution Control)

2.00 credit, 2 hrs/week

Environment Pollution and Its Control: water pollution - sources and types of pollutants, waste assimilation capacity of streams, dissolved oxygen modeling, ecological balance of streams, industrial pollution, heavy metal contamination, detergent pollution and eutrophication; ground-water pollution , marine pollution, pollution control measures - water quality monitoring and management.

Air pollution - sources and types of pollutants, effects of various pollutants on human health, materials and plants, air pollution meteorology, global warming and greenhouse effects , air pollution monitoring and control measures.

CE 839 : Environmental Engineering V (Environment & Development Projects)

2.00 credit, 2 hrs/week

Environment and Development Projects, environment and sustainable development, environmental policies and legislation, environmental implication of sectoral development, environmental quality standards, environmental issues and priorities, environmental impact assessment of development schemes - baseline studies, assessment methodologies, economics of environmental management, special topics.


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CE 829: Urban and Regional Planning

2.00 credit, 2 hrs/week

Introduction to urban planning; Historical thoughts of urban planning, Urban environmental matters, Urban management and brown agenda, Evaluative image of environment of a city/town, Environmental disasters and hazards; GIS in urban environmental planning, Town and city planning, transport planning, environmental planning, Ecological planning. Urban environmental planning in Bangladesh; accelerating urbanization, selected urban planning project in Bangladesh.

CE 832 : Environmental Engineering Sessional II

1.50 credit, 3 hrs/week

Design of water supply and sewage system, design of water and wastewater treatment plant, computer application in environmental engineering, field visits and reporting.

CE 845 : Geotechnical Engineering III

2.00 credit, 2 hrs/week

Foundation for structures subjected to lateral loads, retaining walls and abutments, operation and methods of construction, dewatering and slurry-wall construction.

Flexible earth retaining structures, sheet piles, cofferdams, caissons, machine foundations-elementary vibrations, shear modulus and elastic constants, foundation design for vibration, fundamentals of soil liquefaction.

CE 847 : Geotechnical Engineering IV

2.00 credit, 2 hrs/week

Introduction to critical state soil mechanics, SHANSEP and stress path methods, Stress deformation and failure of soil masses. One, two and three dimensional consolidation problems, pore pressure coefficients, soil structure-interaction, earthquake and liquefaction problems, soil improvement, numerical solution of geotechnical engineering problems.

CE 849: Geotechnical Engineering V

2.00 credit, 2 hrs/week

Introduction to soil-water interaction problems. Permeability, capillarity and soil suction. Seepage analysis, stability of natural, man made slopes and excavations subjected to seepage, water current, wave action etc. Theories of filters and revetment design; hydraulic fills.

CE 844: Geotechnical Engineering Sessional II

1.50 credit, 3 hrs/week

Computer aided design of foundations, retaining walls and reinforced soils, slope stability analysis, techniques of soil improvement, use of computer in geotechnical engineering.


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CE 855: Transportation Engineering III (Traffic Planning & Management)

2.00 credit, 2 hrs/week

The transportation planning process; traffic management concepts, traffic accident investigations; city road and street networks: grade separation and interchanges, pedestrian and bicycle facilities. The urban bypass, environmental aspects of highway traffic and transportation projects, elements of traffic flow.

CE 857: Transportation Engineering IV (Highway Drainage & Airports)

2.00 credit, 2 hrs/week

Highways drainage and drainage structures. Evaluation and strengthening of pavements, importance, advantages and trends in air transportation, planning and design of airports, aircraft characteristics related to airport design, types and elements of airport planning studies, airport configuration, geometric design of the landing area, Terminal area, heliports, design of airport pavements, lighting, marking and signing, Airport drainage.

CE 859: Transportation Engineering V (Transport Projects and Operations)

2.00 credit, 2 hrs/week

Highway needs study, highway planning, economics and financing, evaluation and analysis of transportation projects. management, monitoring, organization and implementation of transportation projects, selected case studies, traffic engineering administration and legislation, urban public transportation and freight movement.

CE 854 : Transportation Engineering Sessional II

1.50 credit, 3 hrs/week

Design of rigid and flexible highway and air field pavements, geometric design, road intersections and interchanges, capacity calculations, traffic studies and design.

CE 871: Groundwater Engineering

2.00 Credit, 2 hrs/week

Groundwater in hydrologic cycle and its occurrence. Physical properties and principles of groundwater movement. Groundwater and well hydraulics. Groundwater resource evaluation. Groundwater levels and environmental influences. Water mining and land subsidence. Groundwater pollution and contaminant transport. Recharge of groundwater. Saline water intrusion in aquifers. Groundwater management

CE 873: River Engineering

2.00 Credit, 2 hrs/week

Behaviour of alluvial rivers. River channel pattern and fluvial processes. Aggradation and degradation, local scours, river training and bank protection works. Navigation and dredging. Sediment movement in river channels, bed forms and flow regimes.


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CE 875: Coastal Engineering

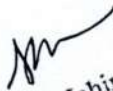
2.00 Credit, 2 hrs/week

Coast and coastal features. Tides and currents. Tidal flow measurement. Waves and storm surges. Docks and harbours. Forces of waves and tides in the design of coastal and harbour structures. Coastal sedimentation processes. Deltas and estuaries. Shore protection works. Dredging and dredgers.

CE 872: Water Resources Engineering Sessional

1.5 Credit, 3 hrs/week

Design of hydraulic structures, river training works. Groundwater resource assessment and water well design.


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