

SUMMARY OF COURSE DESCRIPTIONS

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

COURSE DESCRIPTION OF CIVIL ENGINEERING SUBJECTS

A. MATHEMATICS

ALGEBRA (MATH 115) - Set theory; real numbers; algebraic expressions and operations; equations and inequalities; functions, relations and their graphs; exponential and logarithmic functions; systems of equations; combinatorial mathematics; matrices and determinants; progression; binomial theorem; mathematics induction.

CREDIT UNITS : 3 units

TRIGONOMETRY (MATH 113) - Trigonometric functions; identities and equations; solutions of triangles; law of sines; law of cosines; complex number; inverse trigonometric functions.

CREDIT UNITS : 3 units

PLANE AND SOLID ANALYTIC GEOMETRY (MATH 123) - Coordinate systems; equations and their loci; straight lines, conic sections and higher plane curves; transformation of coordinates; spherical trigonometry; transformation of coordinates in space; quadric surface.

CREDIT UNITS : 3 units

PRE-REQUISITE : Algebra; Trigonometry

SOLID MENSURATION (MATH 122) - Mensuration of the area, perimeter and centroid of plane figures, mensuration of the volume, surface area and center of gravity of solids, proofs and applications of cavalieri's theorem, pappus theorem and the prismoidal theorem.

CREDIT UNITS : 2 units

DIFFERENTIAL CALCULUS (MATH 215) - Functions; limit and continuity; derivatives and differentiation; partial derivatives; applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : Analytic and Solid Geometry; Solid Mensuration

INTEGRAL CALCULUS (MATH 225) - Anti-derivatives, integration methods; definite integrals; multiple integrals; applications; infinite series.

CREDIT UNITS : 3 units

DIFFERENTIAL EQUATIONS (MATH 313) - Ordinary differential equations of the first order, linear differential equations with constant coefficients; simultaneously linear differential equations; applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : Integral Calculus

ADVANCED ENGINEERING MATHEMATICS (MATH 323) - Complex numbers, Exponential form of complex number; Polar form of complex number, Trigonometric functions, Inverses trigonometric, Hyperbolic function, Inverse hyperbolic function, logarithms of complex number, Determinants system of linear equation of the unknown, Materials, Laplace transformation.

CREDIT UNITS : 3 units

PRE-REQUISITE : Differential Equations

PROBABILITY AND STATISTICS (STAT 003) - Basic principles of statistics, charts, graphs, presentation and analysis of data averages, median, mode, deviations, probability, normal curves and applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : Advanced Eng'g. Mathematics

B. PHYSICAL SCIENCES

CHEMISTRY 1 (CHEM 113) - Basic concepts of matter and energy; atomic structure and periodic classification of elements, chemical bonding, atomic and molecular masses, chemical equation, water and hydrogen peroxide and important discussion on gaseous, solid and liquid state of matter.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

CHEMISTRY 2 (CHEM 123) - Deals with reduction oxidation reaction properties of solution and method by which concentrations are expressed. Chemical equilibrium is also studied together with the factors which affect reaction rates, ionization and pH determination.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Chemistry 1

PHYSICS 1 (PHYS 213) - Mechanics; work and energy; waves; sound; heat.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Analytic & Solid Geometry; Solid Mensuration

PHYSICS 2 (PHYS 223) - Electricity and magnetism; light and optics; quantum mechanics.

CREDIT UNITS : Lec: 3 units Lab: 1 unit

PRE-REQUISITE : Physics 1 Lec/Lab

C. BASIC ENGINEERING SCIENCES

ENGINEERING DRAWING - Techniques and practices of engineering towards those elements and composites which are relevant to a particular field of engineering design and construction.

CREDIT UNITS : 3 units

ENGINEERING MECHANICS (MECH 315) - Introductory concepts resultant and equilibrium of force systems operations with free body concept, equilibrium of coplanar and non-coplanar systems. Analysis of trusses, friction, kinematics, centroids, center of gravity, moment of inertia of particles and rigid bodies.

CREDIT UNITS : 5 units

PRE-REQUISITE : Integral Calculus; Physics 2

MECHANICS OF MATERIALS (MECH 325) - Axial forces, strain, stress, shear stress, bending moments, shear & stress relationship, torsion, mohr circle, combined stresses, deflection, columns, and riveted connection.

CREDIT UNITS : 5 units

PRE-REQUISITE : Integral Calculus; Engineering Mechanics

BASIC MECHANICAL ENGINEERING (ME 313) - The areas of the mechanical engineering fields whose theory and practice is included in the practice of civil engineering examples are escalators, pumps, however generators, centralized air conditioning etc.

CREDIT UNITS : 3 units

PRE-REQUISITE : Physics 2; Engineering Mechanics

COMPUTER FUNDAMENTALS & PROGRAMMING (CS 002) - An introduction to the use of computers in engineering, algorithms and flow charting and introductory programming using BASIC.

CREDIT UNITS : 3 units

PRE-REQUISITE : 2nd year standing

BASIC ELECTRICAL ENGINEERING (EE 313) - is an introduction to electric power distribution systems in buildings. It introduces mathematical laws of electricity. The course also introduces lighting found in commercial and educational building. Lighting sources and calculations are studied. System conducts such as conductors, transformers motors are analyzed focusing on their application.

CREDIT UNITS : 3 units

PRE-REQUISITE : Integral Calculus; Physics 2

ENGINEERING ECONOMICS & ACCOUNTING (EEco 003) - Time, value of money, economic decision-problems and criteria, and financial mathematics.

CREDIT UNITS : 3 units

PRE-REQUISITE : 4th year standing

ENGINEERING MANAGEMENT (EMan 003) - Management skills, decision making, planning, marketing production and case studies.

CREDIT UNITS : 3 units

PRE-REQUISITE : 4th year standing

ENGINEERING GEOLOGY (GEO 313) - Study of earth, geological agents and processes, structural relations of rock masses earth formation and stratification and their relation to foundations for engineering structures, identification of rocks and minerals with special emphasis in Philippine Condition.

CREDIT UNITS : 3 units

PRE-REQUISITE : Chemistry; Integral Calculus

ENVIRONMENTAL SCIENCE (CE 323) - Knowledge in ecology and human social development, population growth, the impact of population control, variety of resources and outline plans for attaining sustainable society, the enigma of pollution, and the legal, technical and personal solutions for it, environmental crisis against a social backdrop by examining ethics, economics, and politics.

CREDIT UNITS : 2 units

PRE-REQUISITE : Chemistry; Geology

D. PROFESSIONAL AND ALLIED COURSES

ELEMENTARY AND HIGHER SURVEYING (CE 312/CE 322 Lec & Field) - Theory of surveying instruments including tape, compass, transit, stadia, and level running, traverse and leveling preparation of plans of survey, and relocation. Topographic relocation. Topographic surveying methods, Global Positioning System location for latitude, longitude, time and location of shorelines and sounding, measuring velocity and discharge of streams, aerial and satellite surveying. Use of a Global Positioning Systems in surveying and computer software.

CREDIT UNITS : 6 units

PRE-REQUISITE : Integral Calculus

ENGINEERING SURVEY (CE 412 Lec & Field) - A horizontal and vertical curves line grade, earthwork theory of location as applied to highway and railways, mass diagram, overhaul and estimate of cost. Use of computer software for mass diagram. Layout and alignment of civil works structures.

CREDIT UNITS : 3 units

PRE-REQUISITE : Elementary & Higher Surveying

SOIL MECHANICS (CE 483 Lec & Lab) - Introduction to soil identification, identification, classification and structure engineering properties and behavior of soil including permeability and deformation, introduction to theories of effective stress, consolidation, shear strength and failure. Theories of lateral earth pressure, principles of bearing capacity

and settlement for a shallow foundations, stability of slopes and embankments for a shallow and deep foundations, stability of slopes subsurface exploration methods and soil sampling, geotextiles and materials used for construction of retaining walls.

CREDIT UNITS : 4 units

PRE-REQUISITE : Structural Theory 1 Lec/Lab

STRUCTURAL THEORY 1 & 2 (CE 413/CE 423 Lec & Drafting) - Theory of Stress analysis as applied to determinate structures subject to statics and dynamic loads algebraic and graphical analysis of beams, trusses, portals and building frames. Maximum criteria for moving loads, effect of moving in the stress analysis of highway and railway bridges statically indeterminate beams, rigid frames and trusses, application of slope deflect on, moment distribution methods to the analysis of statically indeterminate structures.

CREDIT UNITS : 7 units

PRE-REQUISITE : Mechanics of Materials

STRUCTURAL DESIGN 1 (CONCRETE) (CE 513 Lec & Drafting) - Design of timber structures with careful attention to details of joints and splices, roof and bridge trusses framework and sca-foldings and other engineering structures.

CREDIT UNITS : 5 units

PRE-REQUISITE : Structural Theory 1 & 2

STRUCTURAL DESIGN 2 (STEEL & TIMBER DESIGN) (CE 512/CE 543 Lec & Drafting) - Design of structural elements in steel including details of joints and splices, design and riveted and welded trusses and plate girders as applied to buildings, bridge and other engineering structures.

CREDIT UNITS : 7 units

PRE-REQUISITE : Structural Theory 1 & 2

HYDRAULICS (CE 463 Lec & Lab) - Flow in pipes and network, uniform flow in open channels energy methods, introduction to varied flow phenomena, forces, on submerged bodies, pumps, turbines and hydropower systems, introduction to scouring and erosion and use of hydraulic modeling.

CREDIT UNITS : 4 units

PRE-REQUISITE : Fluid Mechanics

HYDROLOGY (CE 403) - Precipitation, snowmelt, infiltration run off and stream flow measurements, statistical treatment of hydrological data hydrograph analysis and synthesis evaporation, sedimentation groundwater, structure design floods, reservoir storage and flood routing urban run off and drainage.

CREDIT UNITS : 3 units

PRE-REQUISITE : Hydraulics, Statistics

CONSTRUCTION MATERIALS & TESTING (CE 432 Lec & Lab) - Physical properties of common construction materials primarily metals, wood, concrete and asphalt; examination of properties with respect to design and use of end product, design and control of concrete and asphalt mixtures, introduction to reinforced concrete; principle of testing; characteristics of test; properties of materials.

CREDIT UNITS : 3 units

PRE-REQUISITE : Mechanics of Materials

CONSTRUCTION METHODS & PROJECT MANAGEMENT (CE 522 Lec & Lab) - Management of the construction processes control of project items and cost, resource allocation and management and administration of a construction contract and safety engineering.

CREDIT UNITS : 3 units

PRE-REQUISITE : Fifth year standing

CE PROJECT (CE 511/CE 521 Lec & Lab) - A practice oriented design project integrating the various fields in civil engineers works. Students will operate in groups and will complete a feasibility study for a typical engineering undertaking.

CREDIT UNITS : 3 units

PRE-REQUISITE : Fifth year standing

CE LAWS, CONTRACTS & ETHICS (CE 523) - Study of code of ethics, legal procedure in the practice of civil engineering in the Philippines, ethical relations of an engineer with fellow professionals, clients, and general public, elements of contracts, obligations, civil engineering law, National Building Code and labor laws.

CREDIT UNITS : 3 units

WATER RESOURCES ENGINEERING (CE 573) - Pipe systems, introduction to open channel flow basic hydrology demographic studies, water supply pumps, waste water flows.

CREDIT UNITS : 3 units

PRE-REQUISITE : Hydraulics, Hydrology

HIGHWAY ENGINEERING (CE 443) - Highway administration, transportation planning, highway evaluation; traffic, driver, pedestrian and vehicle characteristics; geometric design, roadside design, highway mass transit facilities; intersection, interchanges, terminals; drainage and drainage structures; traffic engineering, highway materials, flexible pavement design, concrete pavements, high type bituminous pavements; survey, plans, estimates, contracts and supervision; earthworks, bases and subbases, highway maintenance and rehabilitation.

CREDIT UNITS : 3 units

PRE-REQUISITE : Engineering Surveys

E. TECHNICAL ELECTIVES

FOUNDATION ENGINEERING (CE 583) - Shallow footings, independent combined continuous, pile and pile foundation, retaining walls, bridge piers and abutment, cofferdams, caissons, underpinning and earthquake effect on soil foundation system.

CREDIT UNITS : 3 units

PRE-REQUISITE : Soil Mechanics & Structural Design 1

EARTHQUAKE ENGINEERING (CE 422) - Introduction to seismology and seismic analysis of buildings. Effects of earthquake on bearing capacity of structures. Correct procedure for the design of earthquake resistant structures. Design of various structures taking into account seismic forces. Analysis of dynamic structures.

CREDIT UNITS : 3 units

PRE-REQUISITE : Structural Theory 1 & 2

TRANSPORTATION ENGINEERING (CE 443) - Urban transportation planning process, design of urban transportation models including trip generation, urban transit planning and design; classification of materials for pavement; design and construction aspects, design concept and methods of flexible and rigid pavements; geometric design of highways and streets; environmental impacts of transportation system.

CREDIT UNITS : 3 units

PRE-REQUISITE : Highway Engineering

MATRIX ANALYSIS (CE 553) - Analysis of truss and frame structures using flexibility and stiffness of matrix analysis; computer applications.

CREDIT UNITS : 3 units

PRE-REQUISITE : Advanced Eng'g Math, Structural Theory 2

PRE-STRESSED CONCRETE (CE 563) - Principles and methods, analysis and design of sections for bending; ultimate strength of section; loss pre-stress; shear design; application to bridges, buildings, and tanks; special properties of materials needed for effective pre-stressing.

CREDIT UNITS : 3 units

PRE-REQUISITE : Reinforced Concrete Design