

# I. TECHNICAL COURSES

## A. MATHEMATICS

<b>Course Name:</b>	<b>COLLEGE ALGEBRA</b>
<b>Course Description</b>	The course is about the introduction to the theories, relations, functions, and operations on expressions in General Algebra.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hours
<b>Prerequisite</b>	None
<b>Course Objectives</b>	At the end of the course, the student must be able to: <ol style="list-style-type: none"> <li>1. Operate and simplify algebraic expressions.</li> <li>2. Determine the solution sets of all types of algebraic equations, exponential and logarithmic equations; and inequalities</li> <li>3. Determine the solutions sets of systems of equations</li> <li>4. Use the acquired manipulative and analytical skills in solving problems</li> <li>5. Identify the domain and range of a given relation or function.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. The Set of Real Numbers <ol style="list-style-type: none"> <li>1.1. Integer Exponents</li> <li>1.2. Polynomials, Operations, Special Products</li> <li>1.3. Binomial theorem</li> <li>1.4. Factoring Polynomials (including adding and subtracting a perfect square)</li> </ol> </li> <li>2. Rational Expressions <ol style="list-style-type: none"> <li>2.1. Partial Fractions</li> <li>2.2. Rational Exponent</li> <li>2.3. Properties Radicals</li> <li>2.4. The Set of Complex Numbers (Definitions only)</li> </ol> </li> <li>3. Equations <ol style="list-style-type: none"> <li>3.1. Applications of Linear equations</li> <li>3.2. Quadratic equations in One variable (Radical, fractional, Quadratic in Form)</li> <li>3.3. Polynomial Equation of Degree</li> </ol> </li> <li>4. Inequalities <ol style="list-style-type: none"> <li>4.1. Polynomial Inequality</li> <li>4.2. Inequality with Absolute value</li> </ol> </li> <li>5. Functions <ol style="list-style-type: none"> <li>5.1. Inverse Function</li> <li>5.2. Exponential &amp; Logarithmic Functions</li> <li>5.3. Exponential &amp; Logarithmic Equations</li> <li>5.4. Systems of Linear Equations</li> </ol> </li> </ol>

	6. Systems involving Quadratics 6.1. Systems Of Linear Equations by Cramer's Rule
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Algebra and Trigonometry. (A Pre-Calculus Approach), 1983, Sobel, Max A. &amp; Lerner, Norbert, Prentice-Hall, Inc. Englewood Cliffs, New Jersey</li> <li>2. College Algebra (Revised Edition), Catalina Dinio Mijares</li> <li>3. College Algebra, Carbonell, Guevarra, Tabamo (2004), University of Santo Tomas, Philippines</li> <li>4. Mathematics Modules. Learning Resource Center. (1997), Myrna Belarmino, University of the Philippines. Diliman, Quezon City</li> <li>5. Modern Algebra and Trigonometry. Addison-Wesley Publishing Co. (1984) Elbridge Vance</li> <li>6. Other Local and Foreign Textbooks</li> <li>7. Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>PLANE TRIGONOMETRY</b>
<b>Course Description</b>	The course is about the theory and application of Trigonometric functions; identities and equations; solutions of triangles; law of sines; law of cosines; inverse trigonometric functions.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hours
<b>Prerequisite</b>	None
<b>Course Objectives</b>	<p>At the end of the course, the student must be able to:</p> <ol style="list-style-type: none"> <li>1. Define angles and how they are measured</li> <li>2. Define and evaluate each of the six trigonometric function</li> <li>3. Prove trigonometric functions.</li> <li>4. Define and evaluate inverse trigonometric functions.</li> <li>5. Solve trigonometric equations.</li> <li>6. Solve problems involving right triangles using trigonometric function definitions for acute angles</li> <li>7. Solve problems involving oblique triangles by the use of the sine and cosine laws.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Trigonometric Functions <ol style="list-style-type: none"> <li>1.1. Angles and Measurement</li> <li>1.2. Trigonometric functions of Angles</li> <li>1.3. Trigonometric Function Values</li> <li>1.4. The Sine and Cosine of Real Numbers</li> <li>1.5. Graphs of the Sine and Cosine Functions</li> <li>1.6. Solutions of Right Triangle</li> </ol> </li> </ol>

	<ol style="list-style-type: none"> <li>2. Analytic Trigonometry <ol style="list-style-type: none"> <li>2.1. The Eight Fundamental Identities</li> <li>2.2. Proving Trigonometric Identities</li> <li>2.3. Sum and Difference Identities</li> <li>2.4. Double-measure and Half-measure Identities</li> <li>2.5. Inverse Trigonometric Functions</li> <li>2.6. Trigonometric Equations</li> <li>2.7. Identities for the Product, Sum and Difference of Sine and Cosine</li> </ol> </li> <li>3. Applications of Trigonometry <ol style="list-style-type: none"> <li>3.1. The Law of Sines</li> <li>3.2. The Law of Cosines</li> </ol> </li> </ol>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Algebra and Trigonometry. (A Pre-Calculus Approach), 1983, Sobel, Max A. &amp; Lerner, Norbert, Prentice-Hall, Inc. Englewood Cliffs, New Jersey</li> <li>2. Plane Trigonometry, Panopio and Ymas</li> <li>3. Plane Trigonometry, Paul Ryder</li> <li>4. Other Local and Foreign Textbooks</li> <li>5. Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>ANALYTIC GEOMETRY</b>
<b>Course Description</b>	<p>The course covers the study of plane surfaces and solid objects as expressed using algebraic equations. It is divided into two sub-courses namely:</p> <ol style="list-style-type: none"> <li>1. Analytic Geometry which studies Coordinate systems; equations and their loci; straight lines, conic sections and higher plane curves; transformation of coordinates; algebraic curves; polar curves; transformation of coordinates in space; quadric surfaces.</li> </ol>
<b>Number of Units for Lecture and Laboratory</b>	Lecture – 2 units
<b>Number of Contact Hours per week</b>	Lecture - 2 hours
<b>Prerequisite</b>	College Algebra and Plane Trigonometry
<b>Course Objectives</b>	<p>At the end of the course, the student must be able to:</p> <ol style="list-style-type: none"> <li>1. Determine the volumes and surface areas of solid such as cylinders, cubes, parallelepiped, spheres, pyramids, cones, frustum of pyramids</li> <li>2. Set-up equations given enough properties of lines and conic curves.</li> <li>3. Draw the graph of the given equation of lines and conic sections.</li> <li>4. Analyze and trace completely the curves given their equations in both rectangular and polar coordinates in two-dimensional space.</li> </ol>

<p><b>Course Outline</b></p>	<ol style="list-style-type: none"> <li>1. Plane Analytic Geometry <ol style="list-style-type: none"> <li>1.1. The Cartesian Planes</li> <li>1.2. Distance Formula</li> <li>1.3. Point-of-Division Formulas</li> <li>1.4. Inclination and Slope</li> <li>1.5. Parallel and Perpendicular Lines</li> </ol> </li> <li>2. The Line <ol style="list-style-type: none"> <li>2.1. The Point-Slope and The Two-Point Forms</li> <li>2.2. Slope-Intercept and Intercept Forms</li> <li>2.3. Distance from a point to a line</li> </ol> </li> <li>3. The Circle <ol style="list-style-type: none"> <li>3.1. The Standard Form of an Equation of a Circle</li> <li>3.2. Conditions that determine the equation of a circle</li> </ol> </li> <li>4. Conic Sections <ol style="list-style-type: none"> <li>4.1. Introduction – The General Form of a 2<sup>nd</sup> degree Equation</li> <li>4.2. The Parabola</li> <li>4.3. The Ellipse</li> <li>4.4. The Hyperbola</li> </ol> </li> <li>5. Transformation of Coordinates <ol style="list-style-type: none"> <li>5.1. Translation of Conic Sections</li> </ol> </li> <li>6. Curve Sketching <ol style="list-style-type: none"> <li>6.1. Symmetry and Intercepts</li> <li>6.2. Sketching Polynomial Equations</li> <li>6.3. Asymptotes (except slant asymptotes)</li> <li>6.4. Sketching Rational Functions</li> </ol> </li> <li>7. Polar Coordinates <ol style="list-style-type: none"> <li>7.1. Polar Coordinates</li> <li>7.2. Graphs in Polar Coordinates</li> <li>7.3. Relationship between Rectangular and Polar coordinates</li> </ol> </li> </ol>
<p><b>Laboratory Equipment</b></p>	<p>None</p>
<p><b>Suggested Textbooks and Reference Materials</b></p>	<ol style="list-style-type: none"> <li>1. Analytic Geometry, Agalabia and Ymas</li> <li>2. Analytic Geometry, Gordon Fuller</li> <li>3. Analytic Geometry, Love and Rainville</li> <li>4. Calculus with Analytic Geometry, Thurman Peterson, 1960,. Harper and Row</li> <li>5. Introduction to Analytic Geometry and Calculus, Deauna and Lamayo, 1999, Sibs Publishing House, Inc. Philippines</li> <li>6. Other Local and Foreign Textbooks</li> <li>7. Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>SOLID MENSURATION</b>
<b>Course Description</b>	<p>The course covers the study of plane surfaces and solid objects as expressed using algebraic equations. It is divided into two sub-courses namely:</p> <ol style="list-style-type: none"> <li>Analytic Geometry which studies Coordinate systems; equations and their loci; straight lines, conic sections and higher plane curves; transformation of coordinates; algebraic curves; polar curves; transformation of coordinates in space; quadric surfaces.</li> <li>Solid Geometry which covers the measurement of Plane figures, cubes, pallelipipeds; cylinders; prisms; pyramids; frustums of a pyramid; spheres; frustums of a cone</li> </ol>
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 2 units
<b>Number of Contact Hours per week</b>	Lecture - 2 hours`
<b>Prerequisite</b>	College Algebra and Plane Trigonometry
<b>Course Objectives</b>	<p>At the end of the course, the student must be able to:</p> <ol style="list-style-type: none"> <li>Determine the volumes and surface areas of solid such as cylinders, cubes, parallelepiped, spheres, pyramids, cones, frustum of pyramids</li> <li>Set-up equations given enough properties of lines and conic curves.</li> <li>Draw the graph of the given equation of lines and conic sections.</li> <li>Analyze and trace completely the curves given their equations in both rectangular and polar coordinates in two-dimensional space.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>Solid Geometry <ul style="list-style-type: none"> <li>Solid for which <math>V = 1/3Bh</math></li> <li>Pyramids</li> <li>Similar figures</li> <li>Cones</li> <li>Frustum of A Regular Pyramid</li> <li>Frustum of A Right Circular Cone</li> <li>Sphere</li> </ul> </li> </ol>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>Analytic Geometry, Agalabia and Ymas</li> <li>Analytic Geometry, Gordon Fuller</li> <li>Analytic Geometry, Love and Rainville</li> <li>Calculus with Analytic Geometry, Thurman Peterson, 1960,. Harper and Row</li> <li>Introduction to Analytic Geometry and Calculus, Deauna and Lamayo, 1999, Sibs Publishing House, Inc. Philippines</li> <li>Other Local and Foreign Textbooks</li> <li>Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>DIFFERENTIAL AND INTEGRAL CALCULUS</b>
<b>Course Description</b>	The course is about the two major parts of Calculus, namely: 1. Differential Calculus which covers functions; limits and continuity; derivatives of algebraic functions; differentials; partial derivatives; indeterminate forms; applications. 2. Integral Calculus which covers anti-derivatives; integration methods and techniques; definite integrals; multiple integrals; applications; infinite series.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 5 units
<b>Number of Contact Hours per week</b>	Lecture - 5 hours
<b>Prerequisite</b>	College Algebra and Plane Trigonometry
<b>Course Objectives</b>	At the end of the course, the student must be able to: 1. To have a working knowledge of the basic concepts of functions and limits 2. To differentiate algebraic and transcendental functions with ease 3. To apply the concept of differentiation in solving word problems involving optimization, related rates, and approximation 4. To analyze and trace transcendental curves 5. To solve the different types of differential equations 6. To apply differential equations to selected architectural problems.
<b>Course Outline</b>	1. A Review on Functions 1.1. Limits (Squeeze Theorem on the Sine Function) 1.2. Continuity 1.3. Tangents and Other Rates of Change (concept only) 1.4. Derivatives  2. Differentiation Rules/ Formulas 2.1. Polynomial & Exponential Functions 2.2. The Product & Quotient Rules 2.3. Chain Rule, Inverse Trig. Functions 2.4. Implicit Differentiation 2.5. Higher Derivatives  3. Tangents and Normals to a Curve 3.1. Rates of change 3.2. Related Rates 3.3. Approximations and Differentials  4. Maximum and Minimum Values (Concavity, Points of Inflection) 4.1. Optimization Problems  5. The chain rule / implicit differentiation  6. Integration Concept / Formulas 6.1. Anti-differentiation 6.2. Simple Power Formula 6.3. Logarithmic Function

<p><b>Course Outline cont . .</b></p>	<p>6.4. Exponential Function  6.5. General Power Formula  6.6. Constant of Integration  6.7. Definite Integral</p> <p>7. Integration Techniques  7.1. Integration by Parts  7.2. Trigonometric Integrals  7.3. Rational Functions  7.4. Rationalizing Substitution  7.5. Table of Integrals</p> <p>8. Application  8.1. Improper Integrals  8.2. Plane Area  8.3. Areas between Curves</p> <p>9. Other Applications  9.1. Volumes  9.2. Centroids  9.3. Moments of Inertia  9.4. Radius of Gyration  9.5. Work  9.6. Hydrostatics Pressure and Force</p> <p>10. Surfaces Multiple Integral as Volume  10.1. Surface Tracing: Planes  10.2. Spheres  10.3. Cylinders  10.4. Quadratic Surfaces  10.5. Double integrals</p> <p>11. Triple Integrals</p>
<p><b>Laboratory Equipment</b></p>	<p>None</p>
<p><b>Suggested Textbooks and References</b></p>	<p>1. Applied Calculus, Coughlin, 1976, Boston, Allyn and Bacon.  2. Calculus 1: A Tutorial Manual. The Calculus with Analytic Geometry (Part 1), 1999, Baes, Gregorio et al.. Learning Resource Center. University of the Philippines, Diliman, Q.C.  3. Calculus with Analytic Geometry. Thurman Peterson, 1960. Harper and Row  4. Calculus with Applications. 6th edition Lial, Greenwell and Miller. 1998. Addison-Wesley. Mass. USA  5. Differential and Integral Calculus. 6th edition, Love &amp; Rainville. The Macmillan Company, New York.  6. Introduction to Analytic Geometry and Calculus Deauna and Lamayo.. 1999. Sibs Publishing House, Inc. Philippines  7. Introduction to Calculus, Mapa et al. 1984, National Book Store, Philippines  8. Other local and foreign textbooks.  9. Approved Internet sources..</p>

## B. NATURAL / PHYSICAL SCIENCES

<b>Course Name:</b>	<b>PHYSICS 1</b>
<b>Course Description</b>	The course is about the following topics: Vectors; Kinematics; Dynamics; Work, Energy & Power; Impulse & Momentum; Rotation; Dynamics of Rotation; Elasticity; and Oscillations
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 2 units Laboratory - 1 unit
<b>Number of Contact Hours per week</b>	Lecture - 2 hrs Laboratory - 3 hrs
<b>Prerequisite</b>	College Algebra and Plane Trigonometry
<b>Course Objectives</b>	<p>At the end of the course the student must be able to:</p> <ol style="list-style-type: none"> <li>1. Differentiate a vector from a scalar</li> <li>2. Determine the resultant of concurrent vectors</li> <li>3. Solve problems in kinematics</li> <li>4. Apply Newton's Laws of Motion</li> <li>5. Determine the gravitational force between different masses</li> <li>6. Solve problems involving centripetal force for horizontal and vertical curves</li> <li>7. Compute the work done on a given body</li> <li>8. Relate work and energy</li> <li>9. Solve problems by applying the law of conservation of energy</li> <li>10. Solve problems in impulse and momentum and collisions</li> <li>11. Determine the stress and strain on body</li> <li>12. Determine the period of a body in simple harmonic motion</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Vector             <ol style="list-style-type: none"> <li>a. Vectors and scalars</li> <li>b. Graphical method</li> <li>c. Analytical method</li> <li>d. Vector subtraction</li> </ol> </li> <li>2. Kinematics             <ol style="list-style-type: none"> <li>a. Equations of Kinematics</li> <li>b. Freely falling bodies</li> <li>c. Projectile Motion</li> </ol> </li> <li>3. Dynamics             <ol style="list-style-type: none"> <li>a. Newton's Laws of Motion</li> <li>b. Friction</li> <li>c. 1<sup>st</sup> Condition of Equilibrium</li> </ol> </li> <li>4. Work, Energy and Power             <ol style="list-style-type: none"> <li>a. Definition of Work, Energy and Power</li> <li>b. Conservation of Energy</li> </ol> </li> <li>5. Impulse and Momentum             <ol style="list-style-type: none"> <li>a. Definition of Impulse &amp; Momentum</li> <li>b. Conservation of Momentum</li> <li>c. Collisions, Coefficient of Restitution</li> </ol> </li> <li>6. Rotation             <ol style="list-style-type: none"> <li>a. Definition of torque</li> <li>b. 2<sup>nd</sup> Condition of Equilibrium</li> <li>c. Center of Gravity</li> </ol> </li> </ol>

Course Outline <i>cont.</i>	<ol style="list-style-type: none"> <li>7. Dynamics of Rotation <ol style="list-style-type: none"> <li>a. Kinematics of Rotation</li> <li>b. Dynamics of Rotation</li> <li>c. Center of Gravity</li> </ol> </li> <li>8. Elasticity <ol style="list-style-type: none"> <li>a. Hooke's Law</li> <li>b. Stress and Strain</li> <li>c. Modulus of Elasticity</li> </ol> </li> <li>9. Oscillations <ol style="list-style-type: none"> <li>a. Definition of Vibration Motion and simple Harmonic Motion</li> <li>b. Kinematics of Simple Harmonic Motion</li> </ol> </li> <li>10. Simple Pendulum</li> </ol>
<b>Laboratory Equipment</b>	Vernier caliper, metal balls, graduated cylinder, force table, pulleys, meter stick, clamps, fulcrum, spring balance, pendulum, beam balance
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Fundamentals of Physics 5<sup>th</sup> edition, D. Halliday, R. Resnick and J. Walker</li> <li>2. Physics 4<sup>th</sup> edition, Cutnell and K.W. Johnsons</li> <li>3. Physics for Scientists and Engineers 6<sup>th</sup> Edition, Raymond A. Serway and John W. Jewett, Jr. J.D.</li> <li>4. University Physics (10<sup>th</sup> edition), Young, Hugh D. and Freedman, Roger A., Addison Wesley Publishing Co., Inc.</li> <li>5. Other local and foreign textbooks.</li> <li>6. Approved Internet sources..</li> </ol>

<b>6. Course Name:</b>	<b>PHYSICS 2</b>
<b>Course Description</b>	The course is about Fluid Mechanics; Thermal Expansion and Stresses; Heat Transfer; Calorimetry; Waves and Sound waves; Electrostatics; Electricity and Magnetism.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 2 units Laboratory - 1 units
<b>Number of Contact Hours per week</b>	Lecture - 2 hrs Laboratory - 3 hrs
<b>Prerequisite</b>	<b>Physics 1</b>
<b>Course Objectives</b>	<p>At the end of the course the student must be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the characteristics of fluids at rest and in motion</li> <li>2. Compute the buoyant force on an object immersed in a fluid</li> <li>3. Compute the pressure and flow speed of a fluid at any point in a flow tube</li> <li>4. Determine the amount of expansion of a given material in relation to temperature change</li> <li>5. Determine the change in temperature of a given amount of material that loses or gains</li> </ol>

<b>Course Objectives cont .</b>	<ol style="list-style-type: none"> <li>6. Solve problems about the law of heat transfer</li> <li>7. Describe the three methods of heat transfer</li> <li>8. Discuss the properties of waves</li> <li>9. Describe the modes of vibration of strings and air columns</li> <li>10. Solve problems on Doppler Effect</li> <li>11. Compute the electric force between electric charges</li> <li>12. Compute the electric field due to electric charges</li> <li>13. Compute the electric potential due to a charge and electric potential energy of charges</li> <li>14. Define electric current, electric resistance and voltage</li> <li>15. Solve problems on resistance and cells in series and parallel</li> <li>16. State Kirchoff's rules and apply them in a given circuit</li> <li>17. Compute the magnetic field of a given current-carrying conductors</li> <li>18. Compute the magnetic torque on a current conductor in a magnetic field.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Fluids       <ol style="list-style-type: none"> <li>a. Pressure, specific gravity, density</li> <li>b. Archimedes' Principle</li> <li>c. Rate of Flow and continuity principle</li> <li>d. Bernoulli's Principle</li> <li>e. Torricelli's Theorem</li> </ol> </li> <li>2. Thermal Expansion, Thermal Stress</li> <li>3. Heat Transfer</li> <li>4. Calorimetry       <ol style="list-style-type: none"> <li>a. Specific Heat</li> <li>b. Law of Heat Exchange</li> <li>c. Change of Phase</li> </ol> </li> <li>5. Waves       <ol style="list-style-type: none"> <li>a. Types of waves and their Properties</li> <li>b. Sounds</li> </ol> </li> <li>6. Electrostatics       <ol style="list-style-type: none"> <li>a. Charge</li> <li>b. Coulomb's Law</li> <li>c. Superposition Principle</li> <li>d. Electric Field Intensity</li> <li>e. Work and Potential</li> </ol> </li> <li>7. Electricity       <ol style="list-style-type: none"> <li>a. Current</li> <li>b. Resistance</li> <li>c. Emf</li> <li>d. Ohm's Law</li> <li>e. Energy &amp; Power in Circuits</li> <li>f. Series and Parallel Connections</li> <li>g. Kirchoff's Rules</li> </ol> </li> </ol>

Course Outline <i>cont.</i>	8. Magnetism <ol style="list-style-type: none"> <li>a. Magnetic Field of Moving Charges</li> <li>b. Magnetic Field of Current Element</li> <li>c. Motion of a Charge in a magnetic field</li> <li>d. Biot-Savart Law</li> <li>e. Force on a moving charge in a Magnetic field</li> <li>f. Torque on a Current-carrying Loop.</li> </ol>
<b>Laboratory Equipment</b>	Jolly balance, weighing scales, solid weights and masses of different materials (steel, brass, copper, stone, glass, wood, etc.), metal rods, expansion apparatus, steam generator, thermometer, meter stick, electric stove, rubber tubing, calorimeter, stirrer, glass beakers, graduated cylinder
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Fundamentals of Physics 5<sup>th</sup> edition, D. Halliday, R. Resnick and J. Walker</li> <li>2. Physics 4<sup>th</sup> edition, Cutnell and K.W. Johnsons</li> <li>3. Physics for Scientists and Engineers 6<sup>th</sup> Edition, Raymond A. Serway and John W. Jewett, Jr. J.D.</li> <li>4. University Physics (10<sup>th</sup> edition), Young, Hugh D. and Freedman, Roger A., Addison Wesley Publishing Co., Inc.</li> <li>5. Other local and foreign textbooks.</li> <li>6. Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>SCIENCE, ENVIRONMENT AND SOCIETY</b>
<b>Course Description</b>	The course is about the environmental classification, laws issues and other factors that affect the natural environment. It is also about issues on Safety and safety precautions.
<b>Number of Units for Lecture and Laboratory</b>	Lecture -3 units
<b>Number of Contact Hours per week</b>	Lecture- 3 hrs.
<b>Prerequisite/Co-requisite</b>	None
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1.0 have adequate information/knowledge of the impact/implications of the built environment to the natural environment</li> <li>2.0 understand the importance of the conservation/preservation of the natural environment vis-à-vis with the development of the built environment</li> <li>3.0 Have the consciousness with respect to the global threats related to environment and how they can contribute to minimize the earth's destruction</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1.0 Fundamental Laws of the Natural Resources/Environment</li> <li>2.0 Classification of the Natural Resources           <ol style="list-style-type: none"> <li>2.1 Inexhaustible Resources</li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>2.2 Renewable Resources</li> <li>2.3 Non-Renewable Resources</li> <li>3.0 The Eco-Systems <ul style="list-style-type: none"> <li>3.1 Marine Eco-Systems</li> <li>3.2 Coastal Eco-Systems</li> <li>3.3 Lowland Eco-Systems</li> <li>3.4 Upland Eco-Systems</li> <li>3.5 Forest Eco-Systems</li> </ul> </li> <li>4.0 Environmental Threats <ul style="list-style-type: none"> <li>4.1 Causes of Environmental Problems</li> <li>4.2 Global Warming-Greenhouse Gases, Effects of Temperature Change, Kyoto Protocol</li> </ul> </li> <li>Ozone Layer-Ozone Depletion Substances, CFC and Halons Pollution</li> <li>5.0 Laws on Environmental Protection <ul style="list-style-type: none"> <li>5.1 Solid Waste <ul style="list-style-type: none"> <li>5.1.1 Ecological Solid Waste Management Act (RA 9003)</li> <li>5.1.2 Waste generation, waste segregation and volume reduction</li> </ul> </li> </ul> </li> </ul>
<b>Course Outline</b>	<ul style="list-style-type: none"> <li>5.2 Water <ul style="list-style-type: none"> <li>5.2.1 RA 4850 Water Quality Management Act;</li> <li>5.2.2 DENR Order #35 s. 1990 – Revised Effluents Regulations of 1990,</li> <li>5.2.3 LLDA Laws, Rules and Regulations;</li> <li>5.2.4 Sources of Water Pollution, General Pollutants;</li> <li>5.2.5 Water Quality Monitoring;</li> <li>5.2.6 Initiatives to Improve Water Quality</li> </ul> </li> <li>5.3 Air <ul style="list-style-type: none"> <li>5.3.1 Pollution Control Law PD 984;</li> <li>5.3.2 Philippine Clean Air Act RA 8749;</li> <li>5.3.3 Air Quality, Air Pollutants, Air Sampling and Monitoring</li> </ul> </li> <li>6.0 Environmentally critical areas</li> <li>7.0 Environmentally critical projects</li> <li>8.0 Toxic Substances &amp; Hazardous &amp; Nuclear waste (RA6969)</li> <li>9.0 Chemical &amp; Toxic Substance used in construction and manufacturing</li> <li>10.0 Hazard Communication &amp; Chemical Safety</li> <li>11.0 Related health &amp; Safety factors in High Risk Industries &amp; Industrial hygiene</li> <li>12.0 Change in Environment during construction</li> <li>13.0 Environment Management Plan</li> <li>14.0 Reduction of Environment Threats</li> <li>15.0 Built Environment Land uses <ul style="list-style-type: none"> <li>15.1 Past Land uses &amp; historic Features</li> </ul> </li> <li>16.0 Cultural diversity / diverse human habitat</li> <li>17.0 Conservation /Preservation concept <ul style="list-style-type: none"> <li>17.1 Sustainable development</li> <li>17.2 Society responsibility</li> <li>17.3 Save &amp; protect policy from waste, injury, etc.</li> </ul> </li> <li>18.0 Bio-eco engineering</li> </ul>
<b>Studio Equipment</b>	Audio-visual equipment
<b>Suggested Textbooks and References</b>	Suggested References Toward Sustainable Development (2002) – Lawn, Joseph IBON Facts and Figures on Environment (latest)

### C. BASIC ENGINEERING SCIENCES

<b>Course Name:</b>	<b>STATICS OF RIGID BODIES</b>
<b>Course Description</b>	The course covers topics in the statics of rigid bodies including force systems, structure analyses, friction, centroids and centers of gravity and moments of inertia.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	Physics 1 and Differential and Integral Calculus
<b>Course Objectives</b>	At the end of the course, the student must be able to: 1. Understand the principles of equilibrium of particles 2. Determine forces of 2D and 3D structures 3. Understand the principles of static frictions, wedges and built frictions. 4. Determine centroids, center of mass and center of gravity of objects. 5. Determine moment of inertia, mass moment of inertia. 6. Analyze the stresses of trusses, beams and frames.
<b>Course Outline</b>	1. Introduction to mechanics (statics) 2. Force vectors and equilibrium of particles 3. Moment of a force 4. Couples, moment of a couple 5. Equivalent force systems in 2D and 3D 6. Reactions and internal forces acting on beams, trusses, frames and machines 7. Uniformly Distributed Loads, Uniformly Varying Loads, and Catenaries; 8. Dry static friction, wedges, belt friction
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	1. Mechanics for Engineers: Statics 7 <sup>th</sup> edition by Beer and Johnson 2. Engineering Mechanics: Statics 3 <sup>rd</sup> edition by Bedford and Fowler 3. Statics of Rigid Bodies SI Edition by Pacheco 4. Other local and foreign textbooks. 5. Approved Internet sources.

<b>Course Name:</b>	<b>STRENGTH OF MATERIALS</b>
<b>Course Description</b>	This is a course covering topics in strength of materials which includes axial stress and strain, stresses for torsion and bending, combined stresses, beam deflections, indeterminate beams and elastic instability.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units

<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	Statics of Rigid Bodies
<b>Course Objectives</b>	At the end of the course, the students will able to: 1. Understand the concepts of stress and strain 2. Calculate stresses due to bending, shears, torsion under plain and combined loading 3. Analyze statically determinate and indeterminate structures. 4. Determine the elastic stability of columns.
<b>Course Outline</b>	1. Hooke's Law - Elasticity, Stress & Strain Relationships. 2. Moment of Inertia, Centroids, and Radius of Gyration 3. Shear & Moment Diagrams 4. Deflection of Beams 5. Determination of statically determinant structures 6. Elastic stability of columns.
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	1. Strength of Materials (SI version), Matias A. Arreola 2. Strength of Materials 3 <sup>rd</sup> Ed., Ferdinand Singer and Andrew Pytel 3. Other local and foreign textbooks. 4. Approved Internet sources..

<b>Course Name:</b>	<b>THEORY OF STRUCTURES</b>
<b>Course Description</b>	The course is about the determination of values of shear, moments and deflections of statically determinate & indeterminate beams
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	Strength of Materials
<b>Course Objectives</b>	At the end of the course, the student must be able to 1. Determine the values of reactions at the supports, values of shearing force and bending moments of statically determinate beams; 2. Be introduced to the determination of values of reactions at the supports, values of shearing force and bending moments of statically indeterminate beams (continuous beams and restrained beams) using the Three-Moment Equation and the Moment Distribution Methods 3. Draw the shear and moment diagram 4. Be introduced to the methods of determining the deflections of beams.
<b>Course Outline</b>	1. Shear & moment diagram of Simply Supported Beams. 2. Shear & moment diagram of Statically Indeterminate Beams using 2.1. Three-Moment Equation 2.2. Moment Distribution Method

	3. Deflection of Beams.
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Strength of Materials (SI version), Matias A. Arreola</li> <li>2. Strength of Materials 3<sup>rd</sup> Ed., Ferdinand Singer and Andrew Pytel</li> <li>3. Other local and foreign textbooks.</li> <li>4. Approved Internet sources.</li> </ol>

<b>Course Name:</b>	<b>STEEL AND TIMBER DESIGN</b>
<b>Course Description</b>	The course is about the structural design and investigation of simple elements of structural timber and steel.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	Theory of Structure
<b>Course Objectives</b>	<p>At the end of the course, the students must be able to:</p> <ol style="list-style-type: none"> <li>1. Design and investigate simple timber and steel structures; and</li> <li>2. Incorporate relevant provisions of the National Building Code upon the results of such design and investigations.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. A review of the shear and moment diagrams of <ol style="list-style-type: none"> <li>1.1. Simply-supported beams</li> <li>1.2. Cantilevered beams</li> <li>1.3. Continuous beams using the Moment Distribution Method</li> </ol> </li> <li>2. Introduction to the design of simply-supported timber beams</li> <li>3. Introduction to the design of cantilevered beams</li> <li>4. Investigation procedures <ol style="list-style-type: none"> <li>4.1. Simply Supported and Cantilevered Beams</li> <li>4.2. Axially-Loaded Columns</li> </ol> </li> <li>5. Introduction to the design of structural steel</li> <li>6. Design of simply-supported steel sections using the ASTM Manual</li> <li>7. Design of continuous beams by Moment Distribution Method</li> <li>8. Design based on various loading conditions</li> <li>9. Design and investigation of timber and steel beams under moving loads.</li> </ol>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. National Structural Code of the Philippines, 4<sup>th</sup> Ed, 1992</li> <li>2. Timber Design &amp; Construction Methods (SI Version), Venancio Besavilla</li> <li>3. Simplified Engineering for Architects &amp; Builders, 8<sup>th</sup> edition, Harry Parker and James Ambrose</li> <li>4. Other local and foreign textbooks</li> <li>5. Approved Internet sources..</li> </ol>

<b>Course Name:</b>	<b>ARCHITECTURAL STRUCTURES</b>
<b>Course Description</b>	The course is about the design and investigation of simple reinforced concrete structures
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture -3 hrs
<b>Prerequisite</b>	Steel and Timber Design
<b>Course Objectives</b>	At the end of the course, the students must be able to: 1. Design/Investigate simple reinforced concrete structures & 2. Be able to incorporate relevant National Building Code Provisions upon their results.
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Review of Simple Supported Structures</li> <li>2. Review of Indeterminate Structures</li> <li>3. Design of Simply Supported R.C. Beams</li> <li>4. Investigation of S.S R.C. Beams</li> <li>5. Design of One way Slab and the Codes</li> <li>6. Design of 2 Way Slab and the Codes</li> <li>7. Design of Continuous Beams and the Codes</li> <li>8. Design of R.C. Columns (short) and the Codes</li> <li>9. Soil Analysis</li> <li>10. Piling</li> </ol>
<b>Laboratory Equipment</b>	Students may be shown video material of the various testing procedures for aggregates and concrete mix design.
<b>Suggested Textbooks and Reference Materials</b>	<ol style="list-style-type: none"> <li>1. Design of Concrete Structures, Cernica;</li> <li>2. Simplified Design of Concrete Structures for Architects, Harry Parker and James Ambrose</li> <li>3. National Structural Code of the Philippines, 4<sup>th</sup> ed.</li> <li>4. Reinforced Concrete Design Volume1, Venancio Besavilla</li> <li>5. The Theory &amp; Practice of Reinforced Concrete, Dunham</li> <li>6. Reinforced Concrete Design, 6<sup>th</sup> Ed., Chu Kia Wang</li> <li>7. Other local foreign textbooks.</li> <li>8. Approved Approved Internet sources..</li> </ol>

<b>Course Name:</b>	<b>SURVEYING</b>
<b>Course Description</b>	The course covers the theory and use of surveying instruments including tape, transit, level and stadia; methods of running traverse and leveling
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 1 Unit Field Work – 1 Unit

<b>Number of Contact Hours per week</b>	Lecture - 1 hour Field Work - 3 hrs
<b>Prerequisite</b>	College Algebra and Plane Trigonometry
<b>Course Objectives</b>	At the end of the course, the student must be familiar with 1. Basic surveying principles; 2. Land laws; 3. Restrictions imposed by various government agencies.
<b>Course Outline</b>	Pace factor, Taping, Differential Leveling, Transit & Level Surveying, Traverses, Area by DMD method.
<b>Laboratory Equipment</b>	1. 6 units - Transit Equipment 2. 6 units - Steel tape 3. 6 pcs - Leveling rods 12 pcs - Range poles 4. 24 pcs - Marking Pins 5. 1 unit (minimum) Total Station
<b>Suggested Textbooks and Reference Materials</b>	1. Surveying, Davis, Foote and Kelley 2. Surveying Practice, Nathanson Kissam 4 <sup>th</sup> Ed.

## D. ALLIED COURSES

<b>Course Name:</b>	<b>ARCHITECTURAL VISUAL COMMUNICATIONS 1 : GRAPHICS 1</b>
<b>Course Description</b>	The study of visual communication, typography, alphabet of lines and their applications and the use and care of instruments, geometric construction, use of scale, mensuration and dimensioning. Emphasis is given to the study of the theory of projection with analysis of the relationship between points, lines and planes in space. Includes exercises on surface development and graphic presentation
<b>Number of Units for Lecture and Studio</b>	Lecture – 1 unit Studio - 2 unit
<b>Number of Contact Hours per week</b>	Lecture – 1 hour Studio - 6 hours
<b>Prerequisite/Co-requisite</b>	None
<b>Course Objectives</b>	At the end of the term, the student should be able to – <ol style="list-style-type: none"> <li>1. Prepare typographic composition using architectural lettering.</li> <li>2. Properly utilize drawing instruments and drafting paraphernalia.</li> <li>3. Apply alphabet of lines and appropriate drafting techniques in producing geometric drawings.</li> <li>4. Prepare orthographic drawings.</li> <li>5. Compile and submit portfolio of works.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Architectural lettering</li> <li>2. Drawing instruments; use and care</li> <li>3. Alphabet of lines: proper applications</li> <li>4. Rules of dimensioning</li> <li>5. Geometric construction; graphical method</li> <li>6. Theory of projection <ol style="list-style-type: none"> <li>6.1 Orthographic projection</li> <li>6.2 Axonometric projection</li> </ol> </li> <li>7. Surface development <ol style="list-style-type: none"> <li>7.1 Plotting using graphical method</li> <li>7.2 3-D modeling</li> </ol> </li> </ol>
<b>Studio Equipment</b>	Drafting tables and chairs
<b>Suggested Textbooks and References</b>	<p><i>Suggested References:</i></p> <ol style="list-style-type: none"> <li>1. Architectural Graphic Standards Ramsey and Sleeper</li> <li>2. How to Draw Hill, Adrian</li> </ol>

	<p>3. Technical Drafting 1 Cardenas, Elpidio J. &amp; Felizardo Y. Francisco</p> <p>4. The Principles of Architectural Drafting (A Sourcebook of Technics &amp; Graphic Standards) Browning, Hugh C. 1996</p> <p>5. Drafting in the Industry Brown , Walter C. 1984</p>
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<b>Course Name:</b>	<b>ARCHITECTURAL VISUAL COMMUNICATIONS - 2 : VISUAL TECHNIQUES 1</b>
<b>Course Description</b>	The study of visualization and graphic presentation in the form of freehand drawings including still-life and architectural forms and entourage using different media, in black and white/monochrome.
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio - 1 unit
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio - 3 hrs.
<b>Prerequisite/Co-requisite</b>	None
<b>Course Objectives</b>	At the end of the term, the student should be able to – <ol style="list-style-type: none"> <li>1. Visualize three-dimensional forms.</li> <li>2. Prepare freehand drawings of still-life, architectural perspectives and other architectural forms using different media in black and white and monochrome.</li> <li>3. Compile and submit portfolio of works.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Principles of freehand drawing including composition, proportioning and shading</li> <li>2. Techniques in the use of different tools and media in presentation such as – Pencil Pen and Ink</li> <li>3. Wet and Dry Brush</li> <li>4. Other Monochromatic media</li> <li>5. Principles of incorporating architectural entourage in perspectives.</li> </ol>

<b>Studio Equipment</b>	Drafting tables and Chairs Studio lights
<b>Suggested Textbooks and References</b>	<p>Suggested References:</p> <ol style="list-style-type: none"> <li>1. Basic Drawing Gallagher, Jean</li> <li>2. Complete Guide in Drawing and Painting Readers Digest 1997</li> <li>3. Entourage</li> <li>4. How to Draw Hill, Adrian</li> <li>5. Drawing (Step-by-step to Guide Drawing Techniques) Gair, Angela 1994</li> <li>6. Barron's Art Handbooks Mixing Colors – 3. Dry Techniques.  2000</li> </ol>

<b>Course Name:</b>	<b>ARCHITECTURAL VISUAL COMMUNICATIONS- 3 : GRAPHICS 2</b>
<b>Course Description</b>	An introduction to measured drawings applying graphic conventions; the study of pictorial presentation and perspective projections; plotting of shades and shadows in both orthographic and perspective drawings.
<b>Number of Units for Lecture and Studio</b>	Lecture – 1 unit Studio - 2 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio - 6 hrs.
<b>Prerequisite/Co-requisite</b>	Architectural Visual Communications 1 : Graphics 1

<b>Course Objectives</b>	<p>At the end of the term, the student should be able to –</p> <ol style="list-style-type: none"> <li>1. Apply graphic and drafting conventions in the production of simple floor plans, elevations and sections using pencil and pen &amp; ink.</li> <li>2. Apply principles of perspective drawing and plotting of shades and shadows.</li> <li>3. Compile and submit portfolio of works.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Architectural graphic conventions <ol style="list-style-type: none"> <li>1.1 Materials</li> <li>1.2 Line weights</li> <li>1.3 Dimensioning rules</li> <li>1.4 Architectural lettering, rules and proportion conventions</li> <li>1.5 Standard size of paper and requirements for title blocks for working drawings</li> <li>1.6 Sheet composition</li> </ol> </li> <li>2. Architectural drawings <ol style="list-style-type: none"> <li>2.1 Introduction to principles and techniques in producing architectural drawings such as floor plans, elevations and sections.</li> </ol> </li> <li>3. Principles of perspective projection; shades and shadows (exterior and interior perspective) <ul style="list-style-type: none"> <li>One-point</li> <li>Two-point</li> </ul> </li> </ol>
<b>Studio Equipment</b>	Drafting tables and chairs
<b>Suggested Textbooks and References</b>	<p>Suggested References:</p> <ol style="list-style-type: none"> <li>1. Architectural Graphic Standards Ramsey and Sleeper</li> <li>2. How to Draw Hill, Adrian</li> <li>3. Technical Drafting 1 Cardenas, Elpidio J. &amp; Felizardo Y. Francisco</li> <li>4. The Principles of Architectural Drafting (A Sourcebook of Technics &amp; Graphic Standards) Browning, Hugh C. 1996</li> <li>5. Drafting in the Industry Brown , Walter C. 1984</li> </ol>

<b>Course Name:</b>	<b>ARCHITECTURAL VISUAL COMMUNICATIONS 4 : VISUAL TECHNIQUES 2</b>
<b>Course Description</b>	An introduction to the study of color as form-giver; psychology of color; theories of light and color; scientific and aesthetic considerations of color; study and exercises on the use of color as presentation tool; architectural presentations and outdoor color rendering using appropriate techniques in color mixing and application and various media such as watercolor, acrylic paints, pastel etc.
<b>Number of Units for Lecture and Studio</b>	Lecture – 1 unit Studio - 1 unit
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio - 3 hrs.
<b>Prerequisite</b>	<b>Architectural Visual Communications 2 : Visual Techniques 1</b>
<b>Course Objectives</b>	At the end of the term, the student should be able to – 1. Prepare colored architectural presentation and rendering using various media such as watercolor, acrylic paints, and pastel. 2. Submit a portfolio of finished works.
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Theories of light and color <ol style="list-style-type: none"> <li>1.1 Additive and subtractive</li> <li>1.2 Color composition and schemes</li> <li>1.3 Light, shade and shadow in color</li> </ol> </li> <li>2 Architectural rendering materials <ol style="list-style-type: none"> <li>2.1 Types of paper</li> <li>2.2 Types of brushes</li> <li>2.3 Types of watercolors</li> <li>2.4 Other coloring materials</li> <li>2.5 Auxiliary tools and materials</li> </ol> </li> <li>3. Techniques in handling color  Rendering in transparent watercolor (wet and dry)  Rendering in opaque watercolor  Rendering in dry media</li> </ol>
<b>Studio Equipment</b>	Drafting Tables and Chairs Studio lights
<b>Suggested Textbooks and References</b>	Suggested References: <ol style="list-style-type: none"> <li>1. Barron's Art Handbooks Mixing Colors – 3. Dry Techniques.</li> <li>2. Basic Drawing Gallagher, Jean</li> </ol>

	<ol style="list-style-type: none"> <li>3. Complete Guide in Drawing and Painting Readers Digest 1997</li> <li>4. Drawing (Step-by-step to Guide Drawing Techniques) Gair, Angela 1994</li> <li>5. Entourage</li>   <li>6. How to Draw Hill, Adrian</li>   <li>7. Light in Watercolor Barrass, Jackie 2000</li> <li>8. Watercolor Basics: Light , Judy Morris 2000</li> <li>9. Watercolor Mixing: The 12-Hue Method Willard, Christopher 2000</li> </ol>
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<b>Course Name:</b>	<b>ARCHITECTURAL VISUAL COMMUNICATIONS - 5 :VISUAL TECHNIQUES 3</b>
<b>Course Description</b>	Covers exercises on advanced techniques of presentation using mixed media. Includes the study of multi-media composition/digital presentation, photography and computer generation.
<b>Number of Units for Lecture and Studio</b>	Lecture – 1 unit Studio - 1unit
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio - 3 hrs.
<b>Prerequisite/Co-requisite</b>	<b>Architectural Visual Communications 4 : Visual Techniques 2</b>
<b>Course Objectives</b>	At the end of the term, the student should be able to – <ol style="list-style-type: none"> <li>1.Prepare presentations in different media using advanced techniques.</li> <li>2.Prepare simple architectural models</li> <li>3. Compile a portfolio of works.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1.Advanced presentation techniques using: <ol style="list-style-type: none"> <li>1.1 Markers</li> <li>1.2 Colored Pencils</li> <li>1.3 Air-brush</li> <li>1.4 Mixed media</li> </ol> </li> <li>2. Model-making principles and techniques</li> <li>3. Architectural Photography</li> </ol>

	<ul style="list-style-type: none"> <li>3.1 Photographing buildings and landscapes</li> <li>3.2 Photographing table models</li> <li>3.3 Photo-montage techniques</li> <li>4. Introduction to computer-generated presentation.</li> </ul>
<b>Studio Equipment</b>	<ul style="list-style-type: none"> <li>1. Drafting Tables and Chairs</li> <li>2. Studio Lights</li> <li>3. At least one (1) set Airbrush set with compressor per class</li> <li>4. At least one (1) computer set</li> <li>5. One (1) Scanner</li> <li>6. One (1) Printer</li> <li>7. Audio-visual equipment</li> </ul>
<b>Suggested Textbooks and References</b>	<p>Suggested References:</p> <ul style="list-style-type: none"> <li>1. An Introduction to Airbrushing and Photo Retouching Breckon, Brett 1987</li> <li>2. Barron's Art Handbooks Mixing Colors – 3. Dry Techniques.</li> <li>3. Basic Drawing Gallagher, Jean</li> <li>4. Complete Guide in Drawing and Painting Readers Digest 1997</li> <li>5. Drawing (Step-by-step to Guide Drawing Techniques) Gair, Angela 1994</li> <li>6. Dynamic Airbrush Miller David and James M. Effler 1987</li> <li>7. Entourage</li> <li>8. How to Draw Hill, Adrian</li> <li>9. Light in Watercolor Barrass, Jackie 2000</li> <li>10. Watercolor Basics: Light Morris, Judy 2000</li> <li>11. Watercolor Mixing: The 12-Hue Method Willard, Christopher 2000</li> <li>12. Books on Photography</li> <li>13. Books on Computer Presentations</li> </ul>

## E. PROFESSIONAL COURSES

Course Name	ARCHITECTURAL DESIGN 1- INTRODUCTION TO DESIGN
Course Description	Design fundamentals involving basic creative design exercises with emphasis on space, form and mass
Number of Units for Lecture and Studio	Lecture – 1unit Studio – 1 unit
Number of Contact Hours per week	Lecture - 1 hour Studio – 3 hours
Prerequisite/ Corequisite	None
Course Objectives	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. learn the nature of architecture by enabling them to discover their ability to manipulate basic forms and shapes into the basis of architectural form</li> <li>2. discover shapes and its translation into mass, form and shape</li> <li>3. learn the basis of architectural design</li> <li>4. express their creativity and skill through manipulation of shapes and forms to achieve the basis of architecture</li> </ol>
Course Outline	<ol style="list-style-type: none"> <li>1. Introduction to the concept of "DESIGN"</li> <li>2. Visual thinking and Graphic Ideas; Design Concepts</li> <li>3. Design Metaphors, Similes and Analogies; Problem Identification, Understanding</li> <li>4. Formulation of Ideas, Problem Solving Activities and Presentation of Solution</li> <li>5. Introduction to Elements of Design focusing on Forms (various shapes as applied in design)</li> <li>6. Introduction to Elements of Design focusing on Visuals (color, texture, line, value, shape, movement, space etc)</li> <li>7. Elements of Architecture</li> <li>8. Introduction to Principles of Design, Order and ordering Elements</li> <li>9. Geometry and Shapes; Scale, Size, Proportion and Optical Weight</li> <li>10. Repetition, Rhythm, Balance, Symmetry, Harmony and Pattern</li> </ol>
Studio Equipment	Drafting Table and drafting chair
Suggested Textbooks and References	Textbooks: <ol style="list-style-type: none"> <li>1. Architectural Graphic Standards: McGraw Hill. Latest Edition</li> <li>2. Building Types: Time Savers: McGraw Hill. Latest Edition</li> </ol> <p><i>References:</i></p>

	<ol style="list-style-type: none"> <li>1. Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</li> <li>2. Architecture And Polyphony : Building In The Islamic World Today. 2004.</li> <li>3. Architecture And The World Outside. Woud, Auke van der. 2001.</li> <li>4. Architecture: Form, Space &amp; Order. Ching, Francis D.K. Latest Edition</li> <li>5. Architecture In The Philippines : Filipino Building In A Cross-Cultural Context. Klassen, Winand. 1986.</li> <li>6. Architecture Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</li> <li>7. Building Design For Handicapped And Aged Person. Haber, Gilda. 1992.</li> <li>8. Contemporary World Architecture. Pearman, Hugh. 1998.</li> <li>9. Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</li> <li>10. The Culture of Building. Davis, Howard. 1999.</li> <li>11. The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</li> <li>12. The World Atlas of Architecture. Norwich, John Julius ed. 1991.</li> </ol>
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Course Name	<b>ARCHITECTURAL DESIGN 2 - CREATIVE DESIGN FUNDAMENTALS</b>
Course Description	Design exercises involving anthropometrics, modular coordination, functional relationships and activity circuits including basic design techniques and tools
Number of Units for Lecture and Studio	Lecture – 1 unit Studio – 1unit
Number of Contact Hours per week	Lecture - 1 hour Studio – 3 hours
Prerequisite	Architectural Design 1 & Theory 1

<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. learn the nature of architecture by enabling them to discover their ability to manipulate basic forms and shapes into the basis of architectural form</li> <li>2. apply lessons learned in shape manipulation and proper anthropometrics and ergonomics to structures fit for human habitation</li> <li>3. develop their interest in architectural design</li> <li>4. express their creativity and skill through manipulation of shapes and forms to achieve the basis of architecture.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Anthropometrics, Ergonomics, Behavioral Settings, Activity Analyses, Spatial Analyses</li> <li>2. Interrelationship of Spaces, Proximity Matrices and Programming</li> <li>3. Concepts of Simple Residential Design</li> <li>4. Concepts of Complex Residential Design</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chair
<b>Suggested Textbooks and References</b>	<p>Textbooks:</p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition.</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p>References:</p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And Polyphony : Building In The Islamic World Today. 2004.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture: Form, Space &amp; Order. Ching, Francis D.K. Latest Edition</p> <p>Architecture In The Philippines : Filipino Building In A Cross-Cultural Context. Klassen, Winand. 1986.</p> <p>Architecture Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</p> <p>Building Design For Handicapped And Aged Person. Haber, Gilda. 1992.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>

<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 3 - CREATIVE DESIGN IN ARCHITECTURAL INTERIORS</b>
<b>Course Description</b>	Design exercises stressing the value of programming, orientation, and inter-relationship of interior spaces
<b>Number of Units for Lecture and Studio</b>	Lecture – 1unit Studio – 2 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 6 hours
<b>Prerequisite</b>	Architectural Design 2 & Theory of Architecture 2
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. learn architectural forms emphasizing on the development and manipulation of the interior spaces</li> <li>2. perform architectural programming</li> <li>3. appreciate the concept of territoriality</li> <li>4. apply architectural relationships of various interior spaces</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Importance of Climatological, Ecological, Solar &amp; Wind Considerations Day lighting to Design</li> <li>2. Basic Space Programming, Basic Proximity Matrices Complex Space Programming, Detailed Proximity Matrices</li> </ol>
<b>Studio Equipment</b>	Drafting Table and various drafting tools
<b>Suggested Textbooks and References</b>	Textbooks: Architectural Graphic Standards: McGraw Hill. Latest Edition Building Types: Time Savers: McGraw Hill. Latest Edition References: Architecture And Identity: Responses To Cultural And Technological Change. Abel, Chris. 2000. Architecture And Landscape : Barragán, Luis. 2003. Architecture And The World Outside. Woud, Auke van der. 2001. Architecture As Environment. Conti, Flavio. 1978. Architecture : Form, Space & Order. Ching, Francis D.K. Architecture In The Philippines : Filipino Building In A Cross-Cultural

<b>Suggested Textbooks and References cont . .</b>	<p>Context. Klassen, Winand. 1986.</p> <p>Architecture Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>
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<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 4 - SPACE PLANNING 1</b>
<b>Course Description</b>	Design exercises involving innovative approaches on vernacular architecture including energy conservation and space management
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio – 2units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 6 hours
<b>Prerequisite</b>	Architectural Design 3
<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. learn the nature of architecture by enabling them to discover their ability to manipulate basic forms and shapes into the basis of architectural forms.</li> <li>2. apply lessons learned in shape manipulation and proper anthropometrics and ergonomics to structures fit for human habitation</li> <li>3. understand human behavior and human interrelationships as viewed in architectural design</li> <li>4. understand vernacular architecture and how it is designed to fit the tropical environment</li> <li>5. design spaces for the various human behaviors</li> <li>6. develop their interest in architectural design</li> <li>7. express their creativity and skill through manipulation of shapes and forms to achieve the basis of architecture</li> </ol>

<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Construction Materials &amp; Systems as Design considerations, Relation of Form to structure, Utility systems as Design consideration</li> <li>2. Indigenous Building Technologies and their influence to design, New Bldg. Technologies,</li> <li>3. Adaptive Reuse and Restoration</li> </ol>
<b>Studio Equipment</b>	Drafting Table and various drafting tools
<b>Suggested Textbooks and References</b>	<p>Textbooks:</p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition.</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p>References:</p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And Polyphony : Building In The Islamic World Today. 2004.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture: Form, Space &amp; Order. Ching, Francis D.K. Latest Edition</p> <p>Architecture In The Philippines : Filipino Building In A Cross-Cultural Context. Klassen, Winand. 1986.</p> <p>Architecture Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</p> <p>Building Design For Handicapped And Aged Person. Haber, Gilda. 1992.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>

<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 5 - SPACE PLANNING 2</b>
<b>Course Description</b>	Design exercises stressing the analysis of space requirements based on organizational structure, functional set up and human behavior to focus on linkages and interaction to spaces
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio – 3 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 9 hours
<b>Prerequisite</b>	Architectural Design 4
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. learn more complex architectural forms emphasizing on the development and manipulation of the site through proper orientation and manipulation</li> <li>2. learn basic architectural relationships with the environment.</li> <li>3. design spaces for the various human behaviors</li> <li>4. develop their interest in architectural design</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Cost as a factor of Design, Design Options and Cost implications, Materials as cost and Design Factor, Cost control in building</li> <li>2. User requirements and cost Limitations / Opportunities, Energy Efficiency in Buildings and Design Considerations</li> <li>3. Site Considerations and its Contribution to Energy Efficiency</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chair
<b>Suggested Textbooks and References</b>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture As Environment. Conti, Flavio. 1978.</p> <p>Architecture As Response : Preserving The Past, Designing For The Future : Greer, Nora Richer. 1998.</p> <p>Architecture For The Future. De Valle, Shiela. 1996.</p> <p>Architecture : Form, Space &amp; Order. Ching, Francis D.K. Latest Edition</p> <p>Architecture In The Philippines : Filipino Building In A Cross-Cultural</p>

	<p>Context. Klassen, Winand. 1986.</p> <p>Architecture Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</p> <p>Building Design For Handicapped And Aged Person. Haber, Gilda. 1992.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>
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<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 6 - SITE DEVELOPMENT PLANNING &amp; LANDSCAPING</b>
<b>Course Description</b>	Design exercises stressing environmental analysis, aesthetic, topographic, geologic, and seismologic conditions, utilities, circulations, legal considerations and sensitivities of man.
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio – 3units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 9 hours
<b>Prerequisite</b>	Architectural Design 5
<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. learn more complex architectural forms emphasizing on the development and manipulation of the site through proper orientation and manipulation</li> <li>2. learn the basics of site development planning and landscaping.</li> <li>3. understand architectural relationships with the environment</li> <li>4. design spaces for the various human behaviors</li> <li>5. develop further their interest in architectural design</li> </ol>

<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. The Natural and the Built Environment, Green Architecture, Sustainable Architecture, Design &amp; Disaster Mitigation</li> <li>2. Topographical considerations in design, Geological considerations in design, Seismological considerations in Design</li> <li>3. Introduction to the fundamentals of Landscaping</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chair
<b>Suggested Textbooks and References</b>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And Landscape : Barragán, Luis. 2003.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture As Environment. Conti, Flavio. 1978.</p> <p>Architecture As Response : Preserving The Past, Designing For The Future : Greer, Nora Richer. 1998.</p> <p>Architecture : Form, Space &amp; Order. Ching, Francis D.K. Latest Edition.</p> <p>Architecture In The Philippines : Filipino Building In A Cross-Cultural Context. Klassen, Winand. 1986.</p> <p>Is Elementary : Visual Thinking Through Architectural Concepts. Winters, Nathan B. 1997.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>

<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 7 - COMMUNITY ARCHITECTURE AND URBAN DESIGN</b>
<b>Course Description</b>	Design exercises giving emphasis on the socio-cultural activities of man, architectural conservation, proxemics and materials for architecture and designing with nature.
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio – 4 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 12 hours
<b>Prerequisite</b>	<b>Prerequisite</b> : Architectural Design 6
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. learn more complex architectural forms emphasizing design applications of basic urban design principles</li> <li>2. further understand architectural relationships with the environment</li> <li>3. design for communities with an understanding of site development and planning</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. The importance of Community in Public Design, The social Construction of Communities</li> <li>2. Creating &amp; identifying Senses of Place, Physical/Urban Design and communities</li> <li>3. Co-Design Process and its application to Urban Design</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chairs
<b>Suggested Textbooks and References</b>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And Landscape : Barragán, Luis. 2003.</p> <p>Architecture And Urban Development : A Vision For The New Age. Thomas, Derek. 2002.</p> <p>Architecture As Response : Preserving The Past, Designing For The Future : Greer, Nora Richer. 1998.</p> <p>Architecture For The Future. De Valle, Shiela. 1996.</p>

	<p>Architecture In The Philippines : Filipino Building In A Cross-Cultural Context. Klassen, Winand. 1986.</p> <p>Building Design For Energy Economy. Ove, Arup and Partners. 1980.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>
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<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 8 - DESIGN OF COMPLEX STRUCTURES</b>
<b>Course Description</b>	Design exercises giving emphasis to process and development of building structures, utilities, laws, structural concepts and ecological planning.
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio – 4units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 12 hours
<b>Prerequisite</b>	Architectural Design 7
<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. learn more architectural forms emphasizing design applications of complex structures and tall buildings</li> <li>2. apply building laws and regulations into their design outputs</li> <li>3. further understand architectural relationships with the environment and ecology</li> <li>4. design for communities with an understanding of site development and planning</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. The Advent of the Skyscrapers, Intelligent Buildings, Advanced Technology and its effect on Human Behavior</li> <li>2. High Rise Structures with design considerations including Utilities, Ecological and other Site considerations</li> <li>3. Complex Structures with design considerations including Utilities, Ecological and other Site considerations</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chairs

<p><b>Suggested Textbooks and References</b></p>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture As Response : Preserving The Past, Designing For The Future : Greer, Nora Richer. 1998.</p> <p>Architecture For The Future. De Valle, Shiela. 1996.</p> <p>Architecture In Transition : Between Deconstruction And New Modernism. Noever, Peter. 1997.</p> <p>Building Design For Energy Economy. Ove, Arup and Partners. 1980.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Culture of Building. Davis, Howard. 1999.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>
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<p><b>Course Name</b></p>	<p><b>ARCHITECTURAL DESIGN 9 – THESIS RESEARCH WRITING</b></p>
<p><b>Course Description</b></p>	<p>Design exercises stressing the importance of collaboration in solving architectural problems; preliminary research and studies for the terminal project</p>
<p><b>Number of Units for Lecture and Studio</b></p>	<p>Lecture - 1 unit Studio – 4 units</p>
<p><b>Number of Contact Hours per week</b></p>	<p>Lecture - 1 hour Studio – 12 hours</p>
<p><b>Prerequisite</b></p>	<p>All courses in 1<sup>st</sup> - 4<sup>th</sup> year level</p>

<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. learn the importance of research in architecture</li> <li>2. select and research on an architectural problem of their own preference</li> <li>3. discover new aspects of architectural planning, technology and research</li> <li>4. solve complex problems based on their own selected research focus.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. An overview of the Architectural Field and the Built Environment, Challenges and Opportunities, A review of Research Process and Methodologies, Student Assessment of areas of Research, Development of Draft of Thesis Proposal</li> <li>2. Deeper establishment of Research need, situation analysis, development of Theoretical Framework, Operational Definitions, Applicable Methodologies</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chairs
<b>Suggested Textbooks and References</b>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture And Urban Development : A Vision For The New Age. Thomas, Derek. 2002.</p> <p>Architecture For The Future. De Valle, Shiela. 1996.</p> <p>Architecture In Transition : Between Deconstruction And New Modernism. Noever, Peter. 1997.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998.</p> <p>Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>

<b>Course Name</b>	<b>ARCHITECTURAL DESIGN 10 – THESIS RESEARCH APPLICATION</b>
<b>Course Description</b>	Terminal project involving a comprehensive problem in building, interior and landscape architecture integrating the process and issues of previous studies
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio - 4 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio – 12 hours
<b>Prerequisite</b>	Architectural Design 9
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. learn the importance of research in architecture</li> <li>2. discover new aspects of architectural planning, technology and research</li> <li>3. solve complex problems based on their own selected research focus</li> <li>4. defend their architectural thesis proposal</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Spatial Translation, Form Concept Translation, Functional Concept translation, Economic Concept Translation</li> <li>2. Thesis Defense</li> </ol>
<b>Studio Equipment</b>	Drafting Table and drafting chairs
<b>Suggested Textbooks and References</b>	<p><b>Textbooks:</b></p> <p>Architectural Graphic Standards: McGraw Hill. Latest Edition</p> <p>Building Types: Time Savers: McGraw Hill. Latest Edition</p> <p><b>References:</b></p> <p>Architecture And Identity : Responses To Cultural And Technological Change. Abel, Chris. 2000.</p> <p>Architecture And The World Outside. Woud, Auke van der. 2001.</p> <p>Architecture And Urban Development : A Vision For The New Age. Thomas, Derek. 2002.</p> <p>Architecture For The Future. De Valle, Shiela. 1996.</p>

	<p>Architecture In Transition : Between Deconstruction And New Modernism. Noever, Peter. 1997.</p> <p>Contemporary World Architecture. Pearman, Hugh. 1998. Environmental Design. Architecture And Technology. : Coltom-Winslow, Margaret. 1995.</p> <p>The Elements of Style. Calloway, Stephen and Mitchell Beazley. 1991</p> <p>The World Atlas of Architecture. Norwich, John Julius ed. 1991.</p>
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<b>Course Name:</b>	<b>THEORY OF ARCHITECTURE- 1</b>
<b>Course Description</b>	Design theories with emphasis on perceptual and proxemic sensitivities in organizing forms and space
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	None
<b>Course Objectives</b>	<p>At the end of the course, the student should:</p> <ol style="list-style-type: none"> <li>1. Be able to acquire sufficient knowledge of the principles of design by relating architecture to other art forms</li> <li>2. Be acquainted with the broader issues of architectural design process</li> <li>3. Be able to assess proxemic requirements of space</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to the course</li> <li>2. Anthropometric basis of architectural design</li> <li>3. Dimensions: Scale and proportion</li> <li>4. Shape, form and unity</li> <li>5. Balance and gravitational curve</li> <li>6. Visual acuity and perception</li> <li>7. User requirement and perception of space</li> <li>8. Space articulation and territoriality</li> <li>9. Kinesthetic quality of space</li> <li>10. Chromatic energy of architectural design</li> <li>11. Light, color and texture</li> <li>12. Signs, symbols, and the cultural basis of architectural design</li> <li>13. Behavioral stress and circuits</li> </ol>

	14. Building materials as expression of architectural design 15. Construction methods and structures as expression
<b>Studio Equipment</b>	None
<b>Suggested Textbooks and References</b>	<i>Suggested References:</i>  Psychology of Space, M.D. Vernon Hidden Dimension, Edward Twitchell Hall, Nachor, 1990 Behavioral Basis for Architectural Programming, UP College of Architecture

<b>Course Name:</b>	<b>THEORY OF ARCHITECTURE 2</b>
<b>Course Description</b>	Evaluation of current concepts, goals, processes and methodologies applicable to architectural design.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	Theory of Architecture 1
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. Acquire sufficient knowledge in assessing current thoughts on architectural design.</li> <li>2. Understand and apply the analytical tools in determining the relevance of architectural design theories to cultural development.</li> <li>3. Comprehend and utilize the critical methods for analyzing design concepts in relation to national development.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to the course; class requirements, class consultation of rules</li> <li>2. Architectural Design Process and Methodologies;</li> <li>3. Conceptualization Techniques of Architectural Design;</li> <li>4. Masters of Architecture</li> <li>5. Functional concepts and the interior Environment;</li> <li>6. Value, Aspirations and culture;</li> <li>7. Design and public policy;</li> <li>8. Activity Analysis and linkages for efficiency in shelter</li> <li>9. Environmental concepts of Architectural Design;</li> <li>10. Energy Conservation and the Design Process</li> </ol>
<b>Studio Equipment</b>	None

Suggested Textbooks and References	<p><i>Suggested References:</i></p> <p>A History of Architectural Theory, Hanno-Walter Kruft, Princeton Architectural Press, 1994</p> <p>Architecture for People, Byron Mikellides, Hot, Rinehart &amp; Winston, 1980</p> <p>Big Ideas: Concepts, Developments, Explanations, Solutions, Jinny Beyer, Harper Collins 2002.</p> <p>Concept Sourcebook, Edward White</p> <p>Form, Space and Order, Francis D.K. Ching, John Wiley &amp; Sons, 1996</p> <p>Vitruvius: Ten Books on Architecture, Cambridge University Press, 1999</p>
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<b>Course Name:</b>	<b>ARCHITECTURAL INTERIORS</b>
<b>Course Description</b>	Basic design of interior spaces geared toward initial understanding of theories and principles in architectural interiors in relation to anthropometrics, proxemics and ergonomics
<b>Number of Units for Lecture and Studio</b>	Lecture - 2 units Studio – 1 unit
<b>Number of Contact Hours per week</b>	Lecture - 2 hrs Studio – 3 hrs
<b>Prerequisite</b>	Theory of Architecture 2
<b>Course Objectives</b>	<p>At the end of the course, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. know the basics of interior space planning concepts in relation to anthropometrics, proxemics and ergonomics</li> <li>2. use simple concepts of colors and decorative elements in architectural interiors</li> <li>3. apply the basic concepts of interior lighting</li> <li>4. understand the basic materials for interior e.g. textiles, paints etc.</li> <li>5. understand the different periods and contemporary styles</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Definition : Design in Architecture</li> <li>3. Fundamental tools of space planning, design and analysis : Anthropometrics, Proxemics and Ergonomics</li> <li>4. Color Basics, color identification systems and color schemes</li> <li>5. Color illusions and advance scheme principles</li> <li>6. Natural and Artificial lighting systems</li> <li>7. Indicative locations of utility elements e.g. air conditioning units, electrical outlets/switches etc.</li> <li>8. Materials for interior e.g. textile, paints etc.</li> <li>9. Furniture, furnishings and other interior elements</li> <li>10. Architectural interiors types</li> <li>11. Period and contemporary styles</li> <li>12. Design presentation</li> </ol> <p>Project simulation: studio work Client presentation</p>

Studio Equipment	Drafting equipment and Computers
Suggested Textbooks and References	<p><i>Suggested References:</i></p> <p>Ching, Francis, D.k., interior design Illustrated  Miller, Mary C., Color for Interior Architecture  Pile, John, F. . interior design  Beginnings of Interior Environment</p>

<b>Course Name:</b>	<b>BUILDING TECHNOLOGY 1 - BUILDING MATERIALS</b>
<b>Course Description</b>	Building materials- its properties, composition, application and articulation including the mode of specifying these materials in building construction.
<b>Number of Units for Lecture and Studio</b>	Lecture– 3 units
<b>Number of Contact Hours per week</b>	Lecture- 3 hrs
<b>Prerequisite</b>	None
<b>Course Objectives</b>	<p>At the end of the course, the student should be able:</p> <ol style="list-style-type: none"> <li>1. to gain considerable knowledge of the basic properties and composition of building construction and finishing materials including their application and articulation in the building envelope.</li> <li>2. to know the practical application of building materials- its application, installation, fabrication and maintenance methods and techniques relative to building design and construction.</li> <li>3. to specify appropriately building materials considering its applicability, practicability and its functionality and in accordance with the standard and uniform system of specification.</li> <li>4. to express well the language of building materials, both English and local, as used in the building construction industry.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction-history of materials as used in building construction, material properties and its application</li> <li>2. Building Materials <ol style="list-style-type: none"> <li>2.1 Wood and wood products</li> </ol> </li> <li>3. Building stone <ol style="list-style-type: none"> <li>3.1 Classifications of building stone</li> </ol> </li> <li>4. Metals <ol style="list-style-type: none"> <li>4.1 Ferrous metals</li> <li>4.2 Non-ferrous metal</li> </ol> </li> <li>5. Glass and Glazing</li> <li>6. Concrete and concrete products <ol style="list-style-type: none"> <li>6.1 Cement</li> </ol> </li> <li>7. Aggregates</li> <li>8. Adhesive and Sealant</li> </ol>

	<p>9. Waterproofing, damp- proofing, termite control systems and Insulation (thermal)</p> <p>10 Paints and Paint Products</p> <p>11. Plastic and Synthetic Materials</p> <p>12 Indigenous materials</p> <p>    12.1 Non-conventional materials such as saw dust, rice husk, Ipil, coco lumber, etc.</p> <p>    12.2 Recyclable material and other Alternative Building Materials</p> <p>13. Fundamentals of building processes, methods and techniques in Construction, Erection, Addition, Repairs, and Renovation of buildings/ structures</p> <p>    13.1 Carpentry and Joinery</p> <p>    13.2 Hardware and Ironmongery</p> <p>    13.3 Sheet metal and Tinsmithry</p> <p>    13.4 Structural Steel Construction</p> <p>    13.5 Fenestration</p> <p>    13.6 Specialized Works</p>
<b>Studio Equipment</b>	Building materials samples and swatches
<b>Textbooks and References</b>	<p>Suggested References</p> <p><i>Architectural Materials for Construction</i> by Harold J. Rosenand New York: McGraw- Hill, 1996</p> <p><i>Basic Construction Materials</i> by Theodore W. Marotta New Jersey: Prentice Hall, 2002</p> <p><i>Building Construction Illustrated</i> by Francis D.K. Ching New York: Van Van Nostrand Reinhold, 1975</p> <p><i>Building Construction: Materials and Types of Construction</i> New York: John Wiley and Sons, 1975</p> <p><i>Building Cost: Materials and Types of Construction</i> by Huntington, Whiting and Clark New York: McGraw Hill book Co., 1989</p> <p><i>Fundamentals of Building Construction and Materials</i> by Edward Allen New York: John Wiley, 2004</p> <p><i>Home Improvement Manual</i> by The Editors of Reader's Digest New York: Reader's Digest Publishing, 1984</p> <p><i>Materials of Construction</i> by Ronald C. Smith Tokyo: McGraw- Hill, 1973</p> <p><i>Sweets Catalog File: International Construction</i> New York: McGraw- Hill Book Co., 2005</p>

<b>Course Name:</b>	<b>BUILDING TECHNOLOGY 2 - CONSTRUCTION DRAWINGS IN WOOD, STEEL AND CONCRETE (1 Storey Building)</b>
<b>Course Description</b>	Construction methods and techniques and the production of working drawings of a one (1)- storey building structure in wood, masonry, reinforced concrete and steel.
<b>Number of Units for Lecture and Studio</b>	Lecture – 2 units Studio – 1 unit
<b>Number of Contact Hours per week</b>	Lecture – 2 hrs Studio – 3 hrs
<b>Prerequisite/Co-requisite</b>	Prerequisite : Building Technology 1 <i>Corequisite: Building Utilities 1</i>
<b>Course Objectives</b>	At the end of the course, the student should be able: <ol style="list-style-type: none"> <li>1. to familiarize the essentials of working drawing production.</li> <li>2. to delineate and appreciate the language of graphical presentation as a tool in the translation of conceptual designs into working drawings.</li> <li>3. to apply effectively the methods and techniques in the production of construction drawing documents as a basis in the construction, erection or assembling of a building or structure.</li> <li>4. to specify the different materials and apply the various systems and methods of constructing a building.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction <ol style="list-style-type: none"> <li>1.1 Working drawing documents, materials used in building construction and building construction methods</li> </ol> </li> <li>2. Basic working drawing and graphical presentation techniques</li> <li>3. Working Drawings Production (Architectural Drawings) <ol style="list-style-type: none"> <li>3.1 Perspective</li> <li>3.2 Floor Plans <ol style="list-style-type: none"> <li>3.2.1 Ground Floor Plan</li> <li>3.2.2 Second Floor Plan</li> </ol> </li> <li>3.3 Elevations <ol style="list-style-type: none"> <li>3.3.1 Front Elevation</li> <li>3.3.2 Right side Elevation</li> <li>3.3.3 Left side Elevation</li> <li>3.3.4 Rear Elevation</li> </ol> </li> <li>3.4 Sections <ol style="list-style-type: none"> <li>3.4.1 Cross Section</li> <li>3.4.2 Longitudinal Section</li> <li>3.4.3 Bay Section</li> <li>3.4.4 Detailed Sections</li> </ol> </li> <li>3.5 Reflected Ceiling Plans and details</li> <li>3.6 Schedule of Doors and Windows</li> <li>3.7 Schedule of Finishes</li> <li>3.8 Kitchen Details</li> <li>3.9 Toilet Details</li> <li>3.10 Stair Details</li> </ol> </li> <li>4. Structural and Civil Works Documents</li> </ol>

	<ul style="list-style-type: none"> <li>4.1 Foundation Plan and Floor System Plan <ul style="list-style-type: none"> <li>4.1.1 Footing and Footing Tie Beam Details</li> <li>4.1.2 Column Details</li> <li>4.1.3 Floor Beam Details</li> <li>4.1.4 Slab Details</li> </ul> </li> <li>4.2 Roof Framing Plan <ul style="list-style-type: none"> <li>4.2.1 Roof Beam Details</li> <li>4.2.2 Truss Diagrams and Details</li> </ul> </li> <li>5. Plumbing Drawings <ul style="list-style-type: none"> <li>5.1 Water Supply Piping Plan</li> <li>5.2 Sanitary Drainage Plan</li> <li>5.3 Storm Drainage Plan</li> <li>5.4 Plumbing Isometry</li> <li>5.5 Plumbing Details <ul style="list-style-type: none"> <li>5.5.1 Septic Tank Detail</li> <li>5.5.2 Catch Basin Detail</li> <li>5.5.3 Cistern Detail</li> </ul> </li> <li>5.6 General Notes and Specification</li> </ul> </li> <li>6. Electrical Documents <ul style="list-style-type: none"> <li>6.1 Electrical/ Auxiliary Plan <ul style="list-style-type: none"> <li>6.1.1 Lighting Layout</li> <li>6.1.2 Power Layout</li> <li>6.1.3 Auxiliary Line Layout</li> </ul> </li> <li>6.2 Schedule of Loads</li> <li>6.3 Panelboard diagrams</li> <li>6.4 Riser diagram</li> <li>6.5 General Notes and Specifications</li> <li>6.6 Location Plan</li> </ul> </li> </ul>
<b>Studio Equipment</b>	Sample working drawing documents
<b>Suggested Textbooks and References</b>	<p><b><i>Suggested References:</i></b></p> <p><i>Architectural Materials for Construction</i> by Harold J. Rosenand New York: McGraw- Hill, 1996</p> <p><i>Building Construction Handbook</i> by Frederick S. Merritt New York: McGraw- Hill, 1975</p> <p><i>Building Construction Illustrated</i> by Francis D.K. Ching New York: Van Van Nostrand Reinhold, 1975</p> <p><i>Building Construction: Materials and Types of Construction</i> by Whitney Clark Huntington New York: John Wiley and Sons, 1975</p> <p><i>Building Construction Specifications</i> by Ivan T. Rathburn New York: John Wiley and Sons, 1975</p> <p><i>Building Cost: Materials and Types of Construction</i> by Huntington, Whiting and Clark New York: McGraw Hill book Co., 1989</p>

	<p><i>Fundamentals of Building Construction and Materials</i> by Edward Allen New York: John Wiley, 2004</p> <p><i>Sweets Catalog File: International Construction</i> New York: McGraw- Hill Book Co., 2005</p>
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<b>Course Name:</b>	<b>BUILDING TECHNOLOGY 3- CONSTRUCTION DRAWINGS IN STEEL CONCRETE AND MASONRY (2-Storey Building)</b>
<b>Course Description</b>	Construction methods and techniques and the production of working drawings of a medium- rise building of reinforced concrete, masonry, glass and steel.
<b>Number of Units for Lecture and Studio</b>	Lecture – 2 units Studio - 1 unit
<b>Number of Contact Hours per week</b>	Lecture – 2 hrs Studio - 3 hrs
<b>Prerequisite</b>	Building Technology -2, Building Utilities -1
<b>Course Objectives</b>	<p>At the end of the course, the student should be able:</p> <ol style="list-style-type: none"> <li>1. to gain more knowledge on essential concepts and principles relative to construction, erection, assembling and fabrication of a medium- rise building through the production of working drawings.</li> <li>2. to accumulate a considerable amount of knowledge gained from the preceding building technology subject and be able to enhance and apply the same on a more complex project.</li> <li>3. to understand improve methods and techniques in the production of construction drawing documents as a basis in the construction, erection or assembling of a building or structure.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction <ol style="list-style-type: none"> <li>1.1 Working drawing documents, materials specifications and building construction methods</li> </ol> </li> <li>2. Advanced working drawing and graphical presentation techniques</li> <li>3. Working Drawings Production (Architectural Drawings) <ol style="list-style-type: none"> <li>3.1 Perspective</li> <li>3.2 Floor Plans <ol style="list-style-type: none"> <li>3.2.1 Ground Floor- Fifth Floor Plans</li> </ol> </li> <li>3.3 Elevations <ol style="list-style-type: none"> <li>3.3.1 Front Elevation</li> </ol> </li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>3.3.2 Right side Elevation</li> <li>3.3.3 Left side Elevation</li> <li>3.3.4 Rear Elevation</li> <li>3.4 Sections <ul style="list-style-type: none"> <li>3.4.1 Cross Section</li> <li>3.4.2 Longitudinal Section</li> <li>3.4.3 Bay Section</li> <li>3.4.4 Detailed Sections</li> </ul> </li> <li>3.5 Reflected Ceiling Plans <ul style="list-style-type: none"> <li>3.5.1 Section Details</li> </ul> </li> <li>3.6 Doors and Windows <ul style="list-style-type: none"> <li>3.6.1 Door Details</li> <li>3.6.2 Window Details</li> <li>3.6.3 Schedule of Doors and Windows</li> </ul> </li> <li>3.7 Schedule of Floor, Wall (Interior/ Exterior) and Ceiling Finishes</li> <li>3.8 Kitchen Details</li> <li>3.9 Toilet Details</li> <li>3.10 Stair Details <ul style="list-style-type: none"> <li>3.10.1 Detailed Plan</li> <li>3.10.2 Sectional Detail</li> </ul> </li> <li>3.11 Other Architectural Details <ul style="list-style-type: none"> <li>3.11.1 Cabinet and Closet Details</li> <li>3.11.2 Moulding, Grilles, etc. Details</li> </ul> </li> <li>4. Structural and Civil Works Documents <ul style="list-style-type: none"> <li>4.1 Foundation Plan and Floor System Plan <ul style="list-style-type: none"> <li>4.1.1 Foundation (Footing- Spread/ Isolated, Combined, Continuous, Strip, Pile Foundation, Footing Tie Beam, etc. Details</li> <li>4.1.2 Column Details and Schedule</li> <li>4.1.3 Floor Beam Details and Schedule</li> <li>4.1.4 Slab Details and Schedule</li> </ul> </li> <li>4.2 Roof Framing Plan <ul style="list-style-type: none"> <li>4.2.1 Roof Beam Details</li> <li>4.2.2 Truss Diagrams and Details</li> </ul> </li> </ul> </li> <li>5. Plumbing Drawings <ul style="list-style-type: none"> <li>5.1 Water Supply Piping Plan</li> <li>5.2 Sanitary Drainage Plan</li> <li>5.3 Storm Drainage Plan</li> <li>5.4 Plumbing Isometry</li> <li>5.5 Plumbing Details <ul style="list-style-type: none"> <li>5.5.1 Septic Tank Detail</li> <li>5.5.2 Catch Basin Detail</li> <li>5.5.3 Cistern Detail</li> </ul> </li> <li>5.6 General Notes and Specification</li> </ul> </li> <li>6. Electrical Documents <ul style="list-style-type: none"> <li>6.1 Electrical/ Auxiliary Plan <ul style="list-style-type: none"> <li>6.1.1 Lighting Layout</li> <li>6.1.2 Power Layout</li> <li>6.1.3 Auxiliary Line Layout</li> </ul> </li> <li>6.2 Schedule of Loads</li> <li>6.3 Panelboard Diagrams</li> <li>6.4 Riser diagram</li> <li>6.5 General Notes and Specifications</li> <li>6.6 Location Plan</li> </ul> </li> </ul>
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<b>Studio Equipment</b>	Samples of Working Drawings and Materials Swatches
<b>Suggested Textbooks and References</b>	<p>Suggested References</p> <p><i>Architectural Materials for Construction</i> by Harold J. Rosenand New York: McGraw- Hill, 1996</p> <p><i>Building Construction Handbook</i> by Frederick S. Merritt New York: McGraw- Hill, 1975</p> <p><i>Building Construction Illustrated</i> by Francis D.K. Ching New York: Van Van Nostrand Reinhold, 1975</p> <p><i>Building Construction: Materials and Types of Construction</i> by Whitney Clark Huntington New York: John Wiley and Sons, 1975</p> <p><i>Building Construction Specifications</i> by Ivan T. Rathburn New York: John Wiley and Sons, 1975</p> <p><i>Building Cost: Materials and Types of Construction</i> by Huntington, Whiting and Clark New York: McGraw Hill book Co., 1989</p> <p><i>Fundamentals of Building Construction and Materials</i> by Edward Allen New York: John Wiley, 2004</p> <p><i>Standard Handbook of Details for Building Construction</i> by Morton Newman New York: McGraw- Hill, 1968</p> <p><i>Standard Handbook of Structural Details for Building Construction</i> by Morton Newman New York: McGraw- Hill, 1993</p> <p><i>Sweets Catalog File: International Construction</i> New York: McGraw- Hill Book Co., 2005</p>

<b>Course Name:</b>	<b>BUILDING TECHNOLOGY 4- SPECIFICATIONS WRITING AND QUANTITY SURVEYING</b>
<b>Course Description</b>	Specifications writing using uniform system or masterformat, estimating methods and quantity surveying.
<b>Number of Units for Lecture and Studio</b>	Lecture – 2 units Studio – 1 unit

<b>Number of Contact Hours per week</b>	Lecture – 2 hrs Studio – 3 hrs
<b>Prerequisite/Co-requisite</b>	Building Technology -3
<b>Course Objectives</b>	At the end of the course, the student should be able: <ol style="list-style-type: none"> <li>1. to apply the essentials of specification writing in identifying, recommending and using the appropriate type of material for a situation and condition.</li> <li>2. to establish the importance of specifications as non- graphical tool that complements working drawings.</li> <li>3. to learn the different methods and techniques in estimating different quantities of materials, equipment and labor resulting in a more accurate data as a basis for sound project programming, scheduling and control.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to Specifications Writing <ol style="list-style-type: none"> <li>1.1 Types of Specifications</li> <li>1.2 Uniform System or Masterformat <ol style="list-style-type: none"> <li>1.2.1 Three (3)- part Format</li> <li>1.2.1 Sixteen (16) Division Uniform Construction Index</li> </ol> </li> <li>1.3 Specifications Writing Techniques</li> </ol> </li> <li>2. Estimating and Quantity Surveying <ol style="list-style-type: none"> <li>2.1 Introduction to Estimating and Quantity Surveying</li> <li>2.2 Measuring Quantities <ol style="list-style-type: none"> <li>2.2.1 Estimating Civil Works <ol style="list-style-type: none"> <li>2.2.1.1 Sitework, Earthworks (Excavation/ Backfill)</li> <li>2.2.1.2 Concrete Works</li> <li>2.2.1.3 Rebars</li> <li>2.2.1.4 Structural Steel Works</li> </ol> </li> <li>2.2.2 Estimating Architectural Materials and Finishes <ol style="list-style-type: none"> <li>2.2.2.1 Masonry</li> <li>2.2.2.2 Doors and Windows</li> <li>2.2.2.3 Wall Finishes</li> <li>2.2.2.4 Floor Finishes</li> <li>2.2.2.5 Ceiling Finishes</li> </ol> </li> <li>2.2.3 Electrical Materials <ol style="list-style-type: none"> <li>2.2.3.1 Wires, conduits and conduit fittings</li> <li>2.2.3.2 Outlets, switches, receptacles, etc.</li> <li>2.2.3.3 Panelboard, circuit breakers, etc.</li> <li>2.2.3.4 Fixtures</li> </ol> </li> <li>2.2.4 Plumbing Fixtures and Materials <ol style="list-style-type: none"> <li>2.2.4.1 Plumbing Fixtures</li> <li>2.2.4.2 Pipes, Fittings and Valves</li> <li>2.2.4.3 Plumbing Accessories and other appurtenances</li> </ol> </li> </ol> </li> </ol> </li></ol>
<b>Studio Equipment</b>	Sample working drawing documents
<b>Suggested Textbooks and References</b>	<b>Suggested References</b>  <i>Architectural Materials for Construction</i> by Harold J. Rosenand

	<p>New York: McGraw- Hill, 1996</p> <p><i>Building Construction Handbook</i> by Frederick S. Merritt New York: McGraw- Hill, 1975</p> <p><i>Building Construction: Materials and Types of Construction</i> by Whitney Clark Huntington New York: John Wiley and Sons, 1975</p> <p><i>Building Construction Specifications</i> by Ivan T. Rathburn New York: John Wiley and Sons, 1975</p> <p><i>Building Cost: Materials and Types of Construction</i> by Huntington, Whiting and Clark New York: McGraw Hill book Co., 1989</p> <p><i>Fundamentals of Building Construction and Materials</i> by Edward Allen New York: John Wiley, 2004</p> <p><i>Fundamentals of Construction Estimating</i> by David J. Pratt Albany: Delmar Publishers, 1995</p> <p><i>Sweets Catalog File: International Construction</i> New York: McGraw- Hill Book Co., 2005</p>
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<b>Course Name:</b>	<b>BUILDING TECHNOLOGY 5- ALTERNATIVE BUILDING CONSTRUCTION SYSTEMS</b>
<b>Course Description</b>	Construction methods and techniques for different types of buildings using any appropriate alternative building construction system.
<b>Number of Units for Lecture and Studio</b>	Lecture – 2 units Studio – 1 unit
<b>Number of Contact Hours per week</b>	Lecture – 2 hrs Studio – 3 hrs
<b>Prerequisite</b>	Building Technology -3
<b>Course Objectives</b>	<p>At the end of the course, the student should be able:</p> <ol style="list-style-type: none"> <li>1. to gain knowledge on the fundamental principles governing the design, purpose and application of the different types of non-conventional systems of construction.</li> <li>2. to acquire ability to provide working details of the various types of alternative building construction systems and systems components.</li> <li>3. to understand better the advantages of using such system.</li> <li>4. to acquire working knowledge of the latest system of construction available in the building industry.</li> </ol>

	<p>Alternative Building Construction Systems</p> <ol style="list-style-type: none"> <li>1. Cast-in- place and Pre-cast <ol style="list-style-type: none"> <li>1.1 Floor System and Roof Slab System <ol style="list-style-type: none"> <li>1.1.1 Flat Slab</li> <li>1.1.2 Flat Plate</li> <li>1.1.3 Ribbed Floor Slab</li> <li>1.1.4 Waffle Slab</li> <li>1.1.5 Lift Slab</li> <li>1.1.6 Spanstress Floor System</li> <li>1.1.7 Slipform Method</li> </ol> </li> <li>1.2 Wall Panel Systems <ol style="list-style-type: none"> <li>1.2.1 Flat type</li> <li>1.2.2 Ribbed type</li> <li>1.2.3 Window type and wall type</li> <li>1.2.4 Tilt-up Wall Panel System</li> </ol> </li> </ol> </li> </ol>
<p><b>Course Outline</b></p>	<ol style="list-style-type: none"> <li>2. Prestressed Concrete <ol style="list-style-type: none"> <li>2.1 Pre-tensioning</li> <li>2.2 Post-tensioning</li> </ol> </li> <li>3. Composite Construction Method</li> <li>4. Cable/ Tensile Structures</li> <li>5. Membrane Structures</li> <li>6. Shell Structures</li> <li>7. Pre-Engineered Buildings</li> <li>8. Geodesic Structure</li> </ol>
<p><b>Studio Equipment</b></p>	<p>Sample working drawing and detailed drawing documents</p>
<p><b>Suggested Textbooks and References</b></p>	<p><b>Suggested References</b></p> <p><i>Architectural Materials for Construction</i> by Harold J. Rosenand New York: McGraw- Hill, 1996</p> <p><i>Building Construction Handbook</i> by Frederick S. Merritt New York: McGraw- Hill, 1975</p> <p><i>Building Construction Illustrated</i> by Francis D.K. Ching New York: Van Van Nostrand Reinhold, 1975</p> <p><i>Building Construction: Materials and Types of Construction</i> by Whitney Clark Huntington New York: John Wiley and Sons, 1975</p> <p><i>Building Construction Specifications</i> by Ivan T. Rathburn New York: John Wiley and Sons, 1975</p> <p><i>Building Cost: Materials and Types of Construction</i> by Huntington, Whiting and Clark New York: McGraw Hill book Co., 1989</p>

	<p><i>Fundamentals of Building Construction and Materials</i> by Edward Allen New York: John Wiley, 2004</p> <p><i>Fundamentals of Construction Estimating</i> by David J. Pratt Albany: Delmar Publishers, 1995</p> <p><i>Membrane Structures</i> by Klaus- Michel Koch Munich, New York: Prestel, 2004</p> <p><i>Pneumatic Structures: A Handbook for Architects and Engineers</i> by Thomas Herzog London: Crosby Lockwood Staples, 1976</p> <p><i>Precast Concrete in Architecture</i> by Anthony Edwin J. Morris New York: Whitney Library of Design, 1978</p> <p><i>Prestressed Concrete</i> by Yves Guyon London: Contractors Record, 1960</p> <p><i>Structure System</i> by Heino Engel Roetherdruck, Germany, 1997</p> <p><i>Sweets Catalog File: International Construction</i> New York: McGraw- Hill Book Co., 2005</p>
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<b>Course Name:</b>	<b>BUILDING UTILITIES 1 (BU 1) - PLUMBING AND SANITARY SYSTEMS</b>
<b>Course Description</b>	Principles and practices in plumbing and sanitary systems- its design, installation, operation and maintenance in buildings in relation to the immediate surroundings or environment. .
<b>Number of Units for Lecture and Studio</b>	Lecture – 3 units
<b>Number of Contact Hours per week</b>	Lecture– 3 hrs
<b>Prerequisite/Co-requisite</b>	None
<b>Course Objectives</b>	<p>At the end of the course, the student should able:</p> <ol style="list-style-type: none"> <li>1. to acquire adequate understanding on the fundamental concepts and principles, general design and installation of water supply, sanitary drainage systems, storm drainage system, waste disposal systems, and fire protection systems in buildings consistent with trade practices and recommendations.</li> </ol>

	<ol style="list-style-type: none"> <li>2. to inculcate in their minds the importance of sanitation as well as plumbing in the context of building structures as a component of the overall building services function.</li> <li>3. to comprehend and apply pertinent code provisions relative to designing, installation, operation and maintenance of plumbing systems and its components.</li> <li>4. to express common engineering language associated with plumbing, sanitary and fire protection systems</li> </ol>
Course Outline	<p>Plumbing and Sanitary Systems Fundamentals</p> <ol style="list-style-type: none"> <li>1. Introduction- concepts and principles, definition of terms</li> <li>2. Fundamentals of Water Supply System <ol style="list-style-type: none"> <li>2.1 Sources and uses of water</li> <li>2.2 Physical, chemical and biological properties of water</li> <li>2.3 Water treatment methods</li> <li>2.4 Water storage and distribution systems (Hot and Cold Water)</li> </ol> </li> <li>3. Sanitary Drainage Systems- Soil, waste (direct and indirect waste piping systems) and vent piping systems <ol style="list-style-type: none"> <li>3.1 Ventilation and Ventilation system</li> <li>3.2 Plumbing traps</li> </ol> </li> <li>4. Storm Drainage Systems (Surface and subsurface storm water)</li> <li>5. Sewage Disposal Systems, Treatment and Recycling</li> <li>6. Plumbing materials (water supply, sanitary and storm drainage) and fittings <ol style="list-style-type: none"> <li>6.1 Valves and Control devices</li> <li>6.2 Types of joints, connections and supports</li> </ol> </li> <li>7. Plumbing fixtures</li> <li>8. Pumps and Pumping Systems</li> <li>9. Plumbing and sanitary system layout (water supply piping, sanitary and vent piping layout, and storm drainage layout)</li> <li>10. Plumbing Symbols</li> <li>11. General notes and specifications</li> <li>12. Fire Protection systems (Wet, dry, combined and fire sprinkler systems and smoke and fire detection systems)</li> </ol>
Studio Equipment	<p>Mock-up model of a basic plumbing unit  Plumbing materials- pipes, fittings, valves, fixtures and plumbing accessories</p>
Suggested Textbooks and References	<p>Suggested References</p> <p><i>Architectural Graphics Standards</i> by Charles G. Ramsey</p>

	<p>New York: John Wiley, 2000</p> <p><i>Basic Plumbing</i> by Sunset Books Editors, Menlo Park, CA: Sunset, 1995</p> <p><i>Environmental Technologies in Architecture</i> by Bertram Y. Kinzey, Englewood Cliffs, N. J.: Prentice Hall, 1997</p> <p><i>How to Design and Install Plumbing</i> by Arthur John Matthias Chicago: American Technical Society, 1960</p> <p><i>International and Uniform Plumbing Codes Handbook</i> by Roger D. Woodson New York: McGraw- Hill, 2002</p> <p><i>Mechanical and Electrical Equipment for Buildings (9<sup>th</sup> Edition)</i> by Benjamin Stein New York: John Wiley and Sons, 2000</p> <p><i>Mechanical and Electrical Systems in Buildings</i> by William K.Y. Tao Englewood Cliffs, N. J.: Prentice Hall, 1997</p> <p>8. <i>Municipal and Rural Sanitation</i> by Victor M. Ehlers McGraw- Hill Book Company, 1958</p> <p>2. <i>Plumbers Handbook</i> by Joseph P. Almond Theodore Audel Publishers, 1997</p> <p>3. <i>Plumbing</i> by Harold E. Babbit McGraw Hill Book Co., 1960</p> <p><i>Plumbing</i> by Richard Demaske Grosset and Dunlop, 1975</p> <p><i>Plumbing Installation and Design</i> by L.V. Ripka Chicago: American Technical Society, 1997</p> <p><i>Plumbing Systems: Analysis, Design and Construction</i> by Tim Wentz Upper Saddle River, N.J.: Prentice Hall, 1997</p> <p><i>Plumbing Technology</i> by Fred Hall London, New York: Longman Publishing, Inc., 1985</p> <p><i>The National Building Code of the Philippines and Its Implementing Rules and Regulations</i> Quezon City: Philippine Law Gazette, 2001</p> <p><i>Water, Sanitary and Waste Services for Buildings</i> by Wise, Alan Frederick E. &amp; Swatfield, J. A. Oxford: Butterworth- Heinemann, 2002</p>
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<b>Course Name:</b>	<b>BUILDING UTILITIES 2 (BU 2) – ELECTRICAL, ELECTRONICS AND MECHANICAL SYSTEMS</b>
<b>Course Description</b>	Electrical and mechanical systems in buildings- materials, equipment, design, installation and maintenance.
<b>Number of Units for Lecture and Studio</b>	Lecture – 3 units
<b>Number of Contact Hours per week</b>	Lecture – 3 hrs
<b>Prerequisite</b>	Physics 2
<b>Course Objectives</b>	<p>At the end of the course, the student should able:</p> <ol style="list-style-type: none"> <li>1. to realize the importance of electrical and mechanical systems as an essential utility system element in any building or structure, with the ultimate aim of providing for human comfort and satisfaction.</li> <li>2. to acquire fundamental knowledge of the systems involved in relation to the activities occurring within the confines of a building in terms of indoor environment control with the power provided by electricity generating devices and appurtenances.</li> <li>3. to know the basic principles of these systems in terms of function, application, operation and maintenance.</li> <li>4. to converse effectively with allied professionals the common engineering language associated with electrical and mechanical systems.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Electrical Systems <ol style="list-style-type: none"> <li>1.1 Introduction to electricity and electrical systems; electricity as an energy, sources and alternative</li> <li>1.2 Sources of energy</li> <li>1.3 Definition of electrical terms and electrical units</li> <li>1.4 Ohm's Law</li> <li>1.5 Power formula</li> <li>1.6 Electrical circuits- parallel and series circuits</li> <li>1.7 Resistance</li> <li>1.8 Electrical conductors and insulator</li> <li>1.9 Insulated copper conductors- wires and cables</li> <li>1.10 Wiring methods- cable wiring method, raceway methods</li> <li>1.11 Switches</li> <li>1.12 Overcurrent protective devices- fuse, circuit breaker, ground fault circuit interceptor</li> <li>1.13 Wiring devices and other electrical materials- junction boxes, utility boxes, pull boxes</li> </ol> </li> </ol>

<p><b>Course Outline</b></p>	<p>1.14 Electrical Instruments  1.15 Electrical symbols  1.16 Electrical plan- power and lighting layout  1.17 Communication Systems  1.18 Telephone, Intercom, Cable TV, Audio/ Video Systems, PA System  1.19 High Technology (Hi-tech) Systems  1.20 Building Automation System (BAS)  1.21 Robotics  1.22 Intelligent Buildings</p> <p>2. Mechanical System  2.1 Introduction to HVAC Systems- theory of heat, heat transfer, air conditioning system  2.2 Definition of terms  2.3 Air-conditioning systems- types, components and application  2.3.1 Types of Air-conditioning Systems  2.3.2 Types of evaporators  2.3.3 Types of condensers  2.3.4 Types of compressors  2.3.5 Air conditioning equipment and controls  2.3.6 Air cleaning  2.4 Air- conditioning systems fundamental Design</p> <p>3. Vertical Transportation Systems  3.1 Introduction to Vertical Transportation Systems- Elevator, Escalator and other Conveying Systems  3.2 Definition of terms  3.3 Elevator system- its components, application and technical information  3.4 Escalator system- its components, application and technical information  3.5 Mechanical regulations on the design and installation elevators and escalators  3.6 Breakthroughs and innovations in Elevator and Escalator Designs</p>
<p><b>Studio Equipment</b></p>	<p>Electrical systems instruments: voltmeter, ammeter, ohmmeter, wattmeter.  Air- conditioning systems instruments: thermometer, humidistat/ hygostat</p>
<p><b>Textbooks and References</b></p>	<p><i>Suggested References</i></p> <p><i>Architectural Engineering Design: Mechanical Systems</i> by Robert B. Brown  New York: McGraw Hill, 2002</p> <p><i>2. Heating, Refrigeration and Air conditioning Engineering Data Book</i> by the American Society of Heating, Refrigeration and Air conditioning Engineering, 1997</p> <p><i>3. Heating, Ventilating, Airconditioning and Refrigeration</i> by Billy C. Langley  Englewood Cliffs, N.J.: Prentice Hall, 1990</p>

	<p><i>Heating, Ventilating and Airconditioning: Analysis and Design</i> by Faye C. McQuiston, New York: John Wiley and Sons, 2000</p> <p><i>Mechanical and Electrical Equipment for Buildings (9<sup>th</sup> Edition)</i> by Benjamin Stein New York: John Wiley and Sons, 2001</p> <p><i>Mechanical and Electrical Systems in Buildings</i> by William K.Y. Tao Englewood Cliffs, N. J.: Prentice Hall, 1997</p> <p><i>National Electrical Code</i> by National Fire Protection Association, Quincy, Mass.: National Fire Protection Association, 1995</p> <p><i>Practical Electricity</i> by Robert G. Middleton London, New York: Collier- Macmillan, 1988</p> <p><i>Refrigeration and Air- conditioning Technology</i> by William C. Whitman New York: Delmar Publishers, 1988</p> <p><i>Vertical: Lift, Escalator and Paternoster- A Cultural History of Vertical Transportation</i> by Vittorio Magnago Limpuganani Berlin: Ernst and Sohn, 1994</p>
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<b>Course Name:</b>	<b>BUILDING UTILITIES 3 (BU 3) – ACOUSTICS AND LIGHTING SYSTEMS</b>
<b>Course Description</b>	The psycho-physics of acoustics and lighting- its measurement, analysis and application to architectural discipline.
<b>Number of Units for Lecture and Studio</b>	Lecture – 3 units
<b>Number of Contact Hours per week</b>	Lecture – 3 hrs
<b>Prerequisite/Co-requisite</b>	Physics 2
<b>Course Objectives</b>	<p>At the end of the course, the student should be able:</p> <ol style="list-style-type: none"> <li>1. to gain adequate knowledge on the different aspects of acoustics and lighting- principles, design and application.</li> <li>2. to inculcate in their minds the importance of acoustics and lighting in the design of buildings or structures.</li> <li>3. to acquire considerable knowledge on the practical application of the concepts and principles in acoustics and lighting relative to designing space and building envelope.</li> <li>4. to gain fundamental knowledge on the psychological and physiological effects of sound and light on building occupants</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Acoustics <ol style="list-style-type: none"> <li>1.1 Introduction</li> <li>1.2 Definition of Acoustic-related terms</li> </ol> </li> </ol>

	<p>1.3 Sound Theory</p> <ul style="list-style-type: none"> <li>1.3.1 Longitudinal and Transverse Waves</li> <li>1.3.2 Frequency</li> <li>1.3.3 Velocity of Sound Wave propagation</li> <li>1.3.4 Speed of Longitudinal and Transverse Sound Waves</li> <li>1.3.5 Wavelength, Sound Intensity (Free Field propagation)</li> <li>1.3.6 Inverse Square Law (Free Field Condition)</li> <li>1.3.7 Sound Pressure and Sound Pressure Level</li> <li>1.3.8 Intensity Level changes</li> </ul> <p>1.4 Sound Absorption, Reflection and Transmission, Mechanism of Absorption</p> <ul style="list-style-type: none"> <li>1.4.1 Sound Absorption Coefficient (SAC)</li> <li>1.4.2 Noise Reduction and Noise Reduction Coefficient (NRC)</li> <li>1.4.3 Sound Absorption and Treatment</li> <li>1.4.4 Absorptive Materials and its Application</li> <li>1.4.5 Relative Efficiency of Sound Absorbers</li> </ul> <p>1.5 Reverberation Time</p> <p>1.6 Room Acoustics</p> <ul style="list-style-type: none"> <li>1.6.1 Directivity Contour for Speech</li> <li>1.6.2 Sight Line</li> <li>1.6.3 Ray Diagram and Sound Paths</li> <li>1.6.4 Echoes and its control</li> </ul> <p>1.7 Auditorium Acoustics - Calculation and Design (Application)</p> <p>2. Lighting Fundamentals</p> <ul style="list-style-type: none"> <li>2.1 Introduction</li> <li>2.2 Luminous Intensity, Luminous Flux, Illuminance</li> <li>2.3 Definition of Terms</li> <li>2.4 Physics of Light <ul style="list-style-type: none"> <li>2.4.1 Inverse Square Law</li> </ul> </li> <li>Quantity of Light</li> <li>2.5 Light Sources: Their characteristics and application <ul style="list-style-type: none"> <li>2.5.1 Incandescent Lamp</li> <li>2.5.2 Fluorescent La</li> </ul> </li> <li>High Intensity Discharge (HID) Lamp</li> <li>2.6 Lighting Design <ul style="list-style-type: none"> <li>2.6.1 Illumination Methods</li> <li>2.6.2 Types of Lighting Systems</li> <li>2.6.3 Lighting fixtures and its distribution</li> <li>2.6.4 Luminaire Efficiency: Coefficient of Utilization (CU)</li> </ul> </li> <li>2.7 Illumination Calculation <ul style="list-style-type: none"> <li>2.7.1 Calculation of Average Illuminance</li> <li>2.7.2 Calculation of Loss Factor (LLF)</li> <li>2.7.3 Calculation of Horizontal Illuminance by Lumen</li> <li>2.7.4 Coefficient of Utilization (CU) Calculation</li> <li>2.7.5 Lumen/ Flux/ Zonal Cavity Method</li> </ul> </li> <li>Point Method</li> <li>2.8 Lighting Application and Design Using Zonal Cavity Method (General Lighting)</li> </ul>
<b>Studio Equipment</b>	Acoustical instrument: sound level meter Lighting instruments: Photometer, luminance meter
<b>Suggested Textbooks and References</b>	<b>Suggested References</b>

	<p><i>Architectural Acoustics</i> by Christopher N. Brooks McFarland and Co., 2003</p> <p><i>Architectural Acoustics</i> by James B. Cowan New York: McGraw- Hill, 2002</p> <p><i>Architectural Acoustics</i> by M. David Egan McGraw- Hill Book Co., 1986</p> <p><i>Architectural Acoustics: Principles and Design</i> by Madan Mehta Prentice Hall, 1999</p> <p><i>Handbook of Acoustics</i> by Malcolm J. Crocker New York: John Wiley, 1998</p> <p><i>Lighting by Design</i> by Christopher Cuttle Oxford: Architectural Press, 2003</p> <p><i>Lighting Design Basics</i> by Mark Karlen Hoboken, NJ: John Wiley and Sons, 2004</p> <p><i>Practical Illumination</i> by James R. Cravath New York: McGraw- Hill Book Co., 1997</p> <p>Simplified Design for Building Sound Control by James Ambrose and Jeffrey E. Ollswang New York: McGraw-Hill Book Co., 1971</p> <p>Fundamental Acoustics for Buildings by Miguel Montaner UST Publishing House, 1980.</p>
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<b>Course Name:</b>	<b>HISTORY OF ARCHITECTURE 1</b>
<b>Course Description</b>	Architectural manifestation of thoughts from the beginning of civilization to the Byzantine Period.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture : 3 Hrs.
<b>Prerequisite/Co-requisite</b>	None
<b>Course Objectives</b>	At the end of the course, the students should be able to:  1. Make the students understand the evolution of architecture from

	<p>the Pre-historic times to the Byzantine Period.</p> <ol style="list-style-type: none"> <li>2. Distinguish a particular architectural style from another.</li> <li>3. Make a comparative analysis of the architectural styles during the periods covered.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Orientation/ Introduction Requirements Policies Other diagnostic assessments <ol style="list-style-type: none"> <li>1. Introduction on the History of Architecture <ol style="list-style-type: none"> <li>2.1 Its definition and objectives Its principles and influences</li> </ol> </li> <li>2. Pre-Historic Architecture Paleolithic and Mesolithic Period <ol style="list-style-type: none"> <li>3.2 Neolithic Man and architecture</li> </ol> </li> </ol> </li> </ol>
	<ol style="list-style-type: none"> <li>3. Historic Architecture Pre-Classical architecture <ol style="list-style-type: none"> <li>a. West Asiatic Architecture</li> <li>b. Egyptian architecture</li> </ol> </li> <li>Classical Architecture <ol style="list-style-type: none"> <li>a. Aegean and Greek Architecture</li> <li>b. Etruscan and Roman Architecture</li> </ol> </li> <li>Early Christian Architecture</li> <li>Byzantine Architecture</li> </ol>
<b>Laboratory Equipment</b>	Multi-media equipment
<b>Textbooks/ References</b>	<p><i>A History of Architecture</i> (latest ed.); Fletcher, Sir Banister  <i>History of Western Architecture</i>; Klassen, Winand W.;1980  <i>Ancient Egypt</i>; Casson, Lionel  <i>Art Past, Art Present</i>, 3<sup>rd</sup> Ed.; Wilkins, Schultz &amp; Linduff  <i>Classic Readings and Architecture</i>; Stein/ Spreckelmeyer</p>

<b>Course Name:</b>	<b>HISTORY OF ARCHITECTURE - 2</b>
<b>Course Description</b>	Architectural manifestation of civilization and thoughts during the era of western dominance towards post modernism
<b>Number of Units for Lecture and Laboratory</b>	Lecture -3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs.

<b>Prerequisite</b>	History of Architecture 1
<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the evolution of architecture from the Romanesque period to the post modern times.</li> <li>2. Distinguish a particular architectural style from another.</li> <li>3. Make a comparative analysis of the architectural styles during the periods covered.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Orientation/ Introduction</li> <li>2. Requirements</li> <li>3. Policies</li> <li>4. Other diagnostic assessments</li> <li>5. Church Architecture</li> <li>6. Romanesque Architecture</li> <li>7. Gothic architecture</li> <li>8. Man and Universal Self: Architecture in the Renaissance Period</li> <li>9. Man and His Emotions: Baroque and Rococo Architecture</li> <li>10. Man and the State; Architecture during the growth of the European States</li> <li>11. Man and A New Nation: Architecture in Colonial &amp; Post Colonial America</li> <li>12. Man and New Technology: Architecture in the Industrial Revolution</li> <li>13. Man and His Individual Creativity: Architecture at the Beginning of the Twentieth Century</li> <li>14. Man and the New Society: The International Style and Modernism</li> <li>15. Man and Uncertainty: Contemporary Architecture</li> </ol>
<b>Laboratory Equipment</b>	Multi-media equipment
<b>Suggested Textbooks and References</b>	<p><i>A History of Architecture</i> (latest ed.); Fletcher, Sir Banister  <i>Nuttgens, Patrick, Simon and Schuster's Pocket Guide to Architecture;</i></p> <p><i>The Story of Architecture:</i> Nuttgens, Patrick  <i>History of Western Architecture;</i> Klassen, Winand  <i>Great Ages of Man, A History of World Cultures: Age of Faith;</i> Stewart, Desmond et al  <i>Modern Architecture Since 1900;</i> Curtis, William Jr.  <i>An Introduction to 20<sup>th</sup> Century;</i> Peel, Lucy et al.</p>

<b>Course Name:</b>	<b>HISTORY OF ARCHITECTURE 3</b>
<b>Course Description</b>	Architectural reflections of traditional Asian thoughts and civilizations: their changes and challenges in contemporary life.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 Hrs.
<b>Prerequisite</b>	History of Architecture 2
<b>Course Objectives</b>	At the end of the course, the students should be able to: <ol style="list-style-type: none"> <li>1. Understand the mutual reinforcement of culture and architecture reflected in the thoughts of the times.</li> <li>2. Gain sufficient insights in the history of human community with special emphasis on the structures built in Asia.</li> <li>3. Understand the contribution of the past architectures in the development of high tech utilities and construction systems.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Islamic Architecture</li> <li>2. Architecture of India</li> <li>3. Architecture of China</li> <li>4. Architecture of Japan</li> <li>5. Architecture of Indonesia</li> <li>6. Architecture of Thailand</li> <li>7. Architecture of Cambodia</li> <li>8. Architecture of Nepal and Tibet</li> </ol>
<b>Laboratory Equipment</b>	Multi-media equipment
<b>Suggested Textbooks and References</b>	<i>A History of Architecture</i> (latest ed.); Fletcher, Sir Banister <i>Tropical Asian Style</i> ; Francione, Gianni; 1998 <i>The Story of Architecture</i> ; Nuttgens, Patrick <i>History of Western Architecture</i> ; Klassen, Winand <i>Great Ages of Man, A History of World Cultures: Age of Faith</i> ; Stewart, Desmond et al <i>Transforming Traditions: Architecture in the ASEAN Countries</i> ; Lim, Jon ed.;2001 <i>Civilizations (Culture, Ambition, and the Transformation of Nature)</i> ; Fernandez-Armesto, Felipe; 2001

<b>Course Name:</b>	<b>HISTORY OF ARCHITECTURE - 4</b>
<b>Course Description</b>	Reflections on architecture in the Philippines: their changes and

	challenges in contemporary life and the ideology of conserving its architectural legacies.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture : 3 Hrs.
<b>Prerequisite</b>	History of Architecture - 3
<b>Course Objectives</b>	<p>At the end of the course, the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Gain insights in the evolution of Philippine architecture; the local culture and traditions.</li> <li>2. Appreciate heritage sites and structures in the country.</li> <li>3. Make himself aware of the natural and built heritage through the conduct of research.</li> <li>4. Understand the Filipino culture, their behavior and traditions and its effects on architectural space and design;</li> <li>5. Apply the cultural methods for analyzing design concepts in relation to national development;</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Philippine Architecture</li> <li>2. Pre- Spanish period</li> <li>3. Spanish period</li> <li>4. American period</li> <li>5. Post-war period</li> <li>6. Conservation, Preservation and Restoration <ol style="list-style-type: none"> <li>6.1 Definitions and Objectives</li> <li>6.2 Relevant Charters and Laws</li> <li>6.3 Issues and Concerns</li> <li>6.4 Applicable Case Studies (research – based)</li> </ol> </li> </ol>
<b>Laboratory Equipment</b>	Multi-media equipment
<b>Suggested Textbooks and References</b>	<p><i>Cultural Center of the Philippines Encyclopedia of Philippine Art</i>, vol. III- Philippine architecture  Cultural Center of the Philippines; 1994  <i>Philippine Ancestral Houses</i>; Zialcita, Fernando N. and Tinio, Martin I. Jr.; 1996  <i>Folk Architecture</i>; Perez, Rodrigo III, et al; 1989  <i>Philippine Architecture in the Pre-Spanish and Spanish Period 2<sup>nd</sup> Ed.</i>; Alarcon, Norma I.; 1998  <i>Angels In Stones: Churches of the Philippines</i>; Galende, Pedro G. O.S.A. and Javellana, Rene S.J.; 1996  <i>Manila, My Manila</i>; Joaquin, Nick  <i>Lugar</i>; Villalon, Augusto; 2001  <i>Trails to Tropical Treasures: A Tour of ASEAN's Cultural Heritage</i>; World Monuments Fund US/ICOMOS; 1992 .</p>

<b>Course Name:</b>	<b>PROFESSIONAL PRACTICE 1 (LAWS AFFECTING THE PRACTICE OF ARCHITECTURE)</b>
<b>Course Description</b>	<p>Legal obligations and responsibilities of the Architect</p> <p>The course is designed to provide the students with the basic knowledge of all laws related to the practice of architecture</p>
<b>Number of Units for Lecture and Laboratory</b>	<b>Lecture - 3 units</b>
<b>Number of Contact Hours per week</b>	<b>Lecture - 3 hours</b>
<b>Prerequisite</b>	<b>none</b>
<b>Course Objectives</b>	<p>At the end of the course the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Define and differentiate the different laws that affect the practice of architecture in the Philippines</li> <li>2. Understand the ethical and value dimensions of the laws as they apply to situations in the practice of the profession</li> <li>3. Understand the moral responsibilities and obligations of an architect to peers, clients, colleagues in the industry, and society in general</li> <li>4. Know the legal consequences of an architect's actions as they relate to the laws</li> </ol>
	<p>The Architects Laws  RA 9266  RA8981, PRC-BOA  Resolutions  Civil Code  RA8293</p> <p>The Building &amp; Planning Laws  PD1096  PD957  BP344  BP220</p>

<b>Course Outline</b>	Other Laws BOT Law Environmental laws HLURB Guidelines Others
<b>Laboratory Equipment</b>	<b>None</b>
<b>Suggested Textbooks and References</b>	<ol style="list-style-type: none"> <li>1. RA 9266 (The Architecture Act of 2005) and its Implementing Rules and Regulations</li> <li>2. RA8981 (PRC Modernization Act of 2000) and its IRR; PRC-BOA Resolutions</li> <li>3. Civil Code provisions pertinent to the practice of architecture</li> <li>4. RA 8296 (Intellectual Property Code of 1997)</li> <li>5. PD1096 (National Building Code of 1978) and its amended IRR, 2004</li> <li>6. PD957 (Condominium and Subdivision Law) and its amended IRR</li> <li>7. BP220 (Socialized Housing Project) and its amended IRR, 2001</li> <li>8. BP344 (Accessibility Law) and its IRR</li> <li>9. EO 278 (Practice of Architecture and Related Consulting Services for Foreign-Assisted Projects) and its IRR and Guidelines</li> <li>10. BOT Law</li> <li>11. Environmental laws</li> <li>12. HLURB Guidelines</li> <li>13. Other laws not specifically mentioned are assumed introduced in other subjects as applicable.</li> </ol>

<b>Course Name:</b>	<b>PROFESSIONAL PRACTICE 2 (ADMINISTERING THE REGULAR SERVICES OF THE ARCHITECT)</b>
<b>Course Description</b>	<p>Architecture as a Profession, Ethical Norms and Office Procedures</p> <p>The course is designed to provide the students with the basic understanding of the practice of architecture pertaining to the basic services the architect renders within the context of professionalism, ethical conduct and quality service delivery.</p>
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 units

<b>Number of Contact Hours per week</b>	Lecture - 3 hours
<b>Prerequisite</b>	Professional Practice 1
<b>Course Objectives</b>	<p>At the end of the course the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Define the role of ethics and professionalism in the practice of architecture</li> <li>2. Delineate the part played by the profession in the building industry in particular and society in general</li> <li>3. Describe and explain the phases of implementing the basic services of the architect</li> <li>4. Understand the need for effective organization, management and operation in delivering the architect's services</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. The Architect <ol style="list-style-type: none"> <li>1.1 an overview of what the architect and the profession is all about <ol style="list-style-type: none"> <li>a. The Architecture Profession <ol style="list-style-type: none"> <li>i. Past and Present</li> <li>ii. Important Issues and Concerns</li> </ol> </li> <li>b. The Architect and the Law <ol style="list-style-type: none"> <li>i. The Virtues and Values of an Architect</li> <li>ii. The Spectrum of the Architect's Services</li> <li>iii. The 3-D Wheel</li> </ol> </li> <li>c. The Architect's Role in Society <ol style="list-style-type: none"> <li>i. The Building Enterprise</li> <li>ii. Public Interest and Safety</li> </ol> </li> </ol> </li> <li>1.2 Professional Education and Training <ol style="list-style-type: none"> <li>a. The Architect's Education</li> <li>b. Apprenticeship and Diversified Training</li> <li>c. Continuing Professional Development</li> </ol> </li> <li>1.3 Professional Life <ol style="list-style-type: none"> <li>a. Professions and Professional Life</li> <li>b. Professions and Society</li> <li>c. The Professional Practice of Architecture in the Philippines</li> </ol> </li> <li>1.4 Professional Ethics <ol style="list-style-type: none"> <li>a. Professionalism in architectural practice</li> <li>b. Code of Ethical Conduct</li> </ol> </li> </ol> </li> <li>2. The Architect's Regular Services <ol style="list-style-type: none"> <li>The Client Support Circle</li> <li>The Design Service <ol style="list-style-type: none"> <li>a. Design Process</li> <li>b. Contractual Framework</li> <li>c. Delivery Approaches</li> <li>d. Design Documentation</li> </ol> </li> <li>2.3 Construction Related Services <ol style="list-style-type: none"> <li>a. Bidding and Negotiations</li> <li>b. Construction Contract Administration</li> </ol> </li> <li>2.4 The UAP Standard of Professional Practice</li> <li>2.5 Professional Fees</li> <li>2.6 Professional Contracts and Agreements</li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>a. Contractual Issues</li> </ul> <ul style="list-style-type: none"> <li>3. The Firm <ul style="list-style-type: none"> <li>3.1 The Firm : An Overview <ul style="list-style-type: none"> <li>a. Architectural Firms</li> <li>b. The Small Practice</li> </ul> </li> <li>3.2 Firm Organization <ul style="list-style-type: none"> <li>a. Legal Organization/Firm Start Up</li> <li>b. Organizational Choices</li> </ul> </li> <li>3.3 Firm Management <ul style="list-style-type: none"> <li>a. Planning and Positioning</li> <li>b. Design Excellence and Quality Principles</li> <li>c. ISO 9001:1994</li> <li>d. Techniques for Managing Quality</li> </ul> </li> <li>3.4 Human Resources Management</li> </ul> </li> <li>4. The Project: An Introduction <ul style="list-style-type: none"> <li>4.1 The Project : An Overview <ul style="list-style-type: none"> <li>a. Range of Projects</li> <li>b. Complex Projects</li> <li>c. Simple Project</li> </ul> </li> <li>4.2 Project Initiation/Acquisition <ul style="list-style-type: none"> <li>a. The Decision to Build</li> <li>b. Selection of the Design Team</li> <li>c. Seeking the Project</li> </ul> </li> </ul> </li> </ul>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and References</b>	Architects National Code Code of Ethical Conduct Standards of Professional Practice UAP Documents 200 series UAP Documents 300 series Alvienda Law of Private Corporations in the Philippines. Year

<b>Course Name:</b>	<b>PROFESSIONAL PRACTICE 3 (GLOBAL PRACTICE FOR THE 21<sup>ST</sup> CENTURY )</b>
<b>Course Description</b>	The Architect, the Firm, the Project in the Global Arena The course is designed to provide the students with an expanded view of the role of the architect in the built environment and the emerging transformation of the practice of architecture in a global setting.
<b>Number of Units for</b>	<b>Lecture - 3 units</b>

<b>Lecture and Studio</b>	
<b>Number of Contact Hours per week</b>	<b>Lecture - 3 hours</b>
<b>Prerequisite</b>	<b>Professional Practice 2</b>
<b>Course Objectives</b>	<p>At the end of the course the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Identify and delineate the expanded role of the architect beyond the regular services</li> <li>2. Define and explain the comprehensive design services of the architect</li> <li>3. Describe the processes involved in the generation of a globally competitive quality office project management system</li> <li>4. Appreciate the implications of a globally open practice</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Supplemental Services of the Architect <p>The expanded role of the architect in the built Environment</p> <ol style="list-style-type: none"> <li>1.1 Pre Design Services</li> <li>1.2 Allied Services <ol style="list-style-type: none"> <li>a. Architectural Interiors</li> <li>b. Landscape Architecture</li> </ol> </li> <li>1.3 Planning Services <ol style="list-style-type: none"> <li>a. Site Planning</li> <li>b. Subdivision Planning</li> <li>c. Urban and Community Design</li> </ol> </li> <li>1.4 Environmental Planning Services <ol style="list-style-type: none"> <li>a. Urban Planning</li> <li>b. Regional Planning</li> </ol> </li> </ol> <p>The scope of services, responsibilities and compensation packages involved in undertaking any of the supplemental services that an architect can engage in.</p> <ol style="list-style-type: none"> <li>1.5 Post Construction Services</li> <li>1.6 Construction Services</li> <li>1.7 Construction Management</li> </ol> </li> <li>2. The Comprehensive Services of the Architect <p>(The compendious scope of the practice of architecture; the primacy of the architectural professional in the design of the built environment.)</p> <p>The Comprehensive Service of the Architect</p> </li> <li>3. Office Project Management <ol style="list-style-type: none"> <li>3.1 Project Management <ol style="list-style-type: none"> <li>a. The Small Project</li> <li>b. The Project Teams</li> <li>c. Project Operations</li> <li>d. Project Controls</li> </ol> </li> <li>3.2 Risk Management <ol style="list-style-type: none"> <li>a. Managing Project Risks and Opportunities</li> <li>b. Project Disputes</li> </ol> </li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>c. Firm Insurance</li> </ul> <p>3.3 Inter-Professional Relationships</p> <ul style="list-style-type: none"> <li>a. Inter-Firm Alliances</li> <li>b. Design Team Arrangements</li> </ul> <p>4. The Business of Architecture (Managing and marketing an office towards a global practice; financial management of such a practice.)</p> <ul style="list-style-type: none"> <li>4.1 Marketing and Public Relations <ul style="list-style-type: none"> <li>a. Strategies</li> <li>b. Public Relations</li> <li>c. Project Sourcing</li> </ul> </li> <li>4.2 Financial Management <ul style="list-style-type: none"> <li>a. Financial Systems</li> <li>b. Financial Planning</li> <li>c. Financial Health</li> <li>d. Acquiring Capital</li> <li>e. Services and Compensation</li> </ul> </li> </ul> <p><b>5. Global Practice (Seminar Mode)</b></p> <ul style="list-style-type: none"> <li>5.1 The Political Reality of Globalization and the Open Practice of the Architecture in the Philippines <ul style="list-style-type: none"> <li>a. Issues of Practice in the Global Context</li> <li>b. APEC Architect Operations Manual</li> <li>c. ASEAN Architects Operations Manual</li> <li>d. MRAs (Mutual Recognition Agreements)</li> </ul> </li> </ul>
<b>Studio Equipment</b>	<b>None</b>
<b>Suggested Textbooks and References</b>	<b>GATS (General Agreement on Trade in Services)</b> <b>UIA Accord</b> <b>APEC Architect Operations Manual</b> <b>ASEAN Architects Operations Manual</b> <b>MRAs (Mutual Recognition Agreements)</b>

<b>Course Name:</b>	<b>PLANNING 1 – SITE PLANNING AND LANDSCAPE ARCHITECTURE</b>
<b>Course Description</b>	The artistic and functional arrangement of buildings, open spaces, service areas, circulation and other external areas; techniques in the enhancement and design of exterior environments.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs.

<b>Prerequisite</b>	Surveying and Science, Environment and Society
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the art of site planning &amp; landscape architecture, exposition on their principles and methods of construction.</li> <li>2. Describe the ecological, social, psychological, aesthetic &amp; functional basis of site planning.</li> <li>3. Relate the social Issues &amp; implications of site planning.</li> <li>4. To relate history &amp; planning theories to ecology and sustainable development.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1.0 Introduction to Site Planning and Landscape Architecture</li> <li>2.0 Parameters of Site Selection and Analysis</li> <li>3.0 Ecological Considerations of Site: <ol style="list-style-type: none"> <li>3.1 Ground form</li> <li>3.2 Soil and geology</li> <li>3.3 Water Resources</li> <li>3.4 Microclimate</li> <li>3.5 Orientation</li> </ol> </li> <li>4.0 Social and Psychological Considerations <ol style="list-style-type: none"> <li>4.1 Site Values/Social Impact</li> <li>4.2 Behavior Settings</li> <li>4.3 User requirements</li> <li>4.4 Cultural/Historical Significance</li> <li>4.5 Activity/Communication Linkages</li> <li>4.6 Pertinent Laws <ol style="list-style-type: none"> <li>4.6.1 Local government ordinances</li> <li>4.6.2 Land use and zoning</li> <li>4.6.3 Others</li> </ol> </li> </ol> </li> <li>5.0 Aesthetic and Physical Considerations <ol style="list-style-type: none"> <li>5.1 Site Context</li> <li>5.2 Image/Symbols</li> <li>5.3 Sensuous Qualities</li> <li>5.4 Vocabulary of space <ol style="list-style-type: none"> <li>5.4.1 Sensuous Forms</li> </ol> </li> </ol> </li> <li>6.0 Movement Systems: <ol style="list-style-type: none"> <li>6.1 Pedestrian</li> <li>6.2 Vehicular</li> <li>6.3 Road layouts</li> </ol> </li> <li>7.0 Site Development</li> <li>8.0 Landscape Design</li> <li>9.0 Concepts and Principles of Green Architecture as applied in site planning and landscape design</li> <li>10.0 Cost Factors</li> </ol>
<b>Studio Equipment</b>	Audio-visual equipment
<b>Suggested Textbooks and References</b>	<p>Suggested References:</p> <p>Site Planning – Lynch, Kevin (latest edition)  Site Planning Standards – De Chiara &amp; Koppelman</p>

	<p>A Pictorial Cyclopedia of Philippine Ornamental Plants – Madulid, Domingo A.</p> <p>Time Saver Standards for Landscape Architecture – CW Harris/NT Dines (latest edition)</p> <p>Landscape Architect's Portable Handbook – Dines, Nicholas T. and Brown, Kyle D., 2001</p> <p>Construction Design for Landscape Architects – Minson, Albe E.</p> <p>Site Design and Construction Detailing – Walker, Theodore E.</p>
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<b>Course Name:</b>	<b>PLANNING 2 – FUNDAMENTALS OF URBAN DESIGN &amp; COMMUNITY ARCHITECTURE</b>
<b>Course Description</b>	<b>Spatial Order, Socio –Cultural expression</b> in the design of the exterior environment in neighborhoods, communities, towns & cities.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 Hrs.
<b>Prerequisite</b>	Planning 1
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. acquire a sense of spatial order, scale, culture and history in handling urban design and community architecture problems;</li> <li>2. develop awareness on the need for <b>socio-cultural expression</b> and communication in the design of specific place in towns and cities;</li> <li>3. have a working knowledge of organization and behavior in the design of specific towns and cities.</li> <li>4. have an awareness on the importance of community involvement/participation and co-design techniques in urban/community architecture.</li> <li>5. to design the built environment in the context of ecological balance, sustainable development and conservation of cultural and historical heritage.</li> </ol>

<p><b>Course Outline</b></p>	<ol style="list-style-type: none"> <li>1. Introduction to Urban Design &amp; Community Planning:             <ol style="list-style-type: none"> <li>1.1 Contextualization of urban design &amp; community architecture</li> </ol> </li> <li>2. Socio-Cultural Basis of Design of Communities</li> <li>3. Historical Background:             <ol style="list-style-type: none"> <li>Aesthetics/ Community Architecture</li> </ol> </li> <li>4. Orientation &amp; Identity in Community Architecture</li> <li>5. Creating and Identifying the Sense of Place and Sense of Time</li> <li>6. Signs and Symbols in Urban Design</li> <li>7. Elements of Urban Design</li> <li>8. The Image of the City</li> <li>9. Responsive Environment</li> <li>10. Space in Urban Design, Urban Aesthetics, Urban Pattern</li> <li>11. Documenting the City: The system of design and process of presentation</li> <li>12. Theories, Rules, and Process in Urban Design</li> <li>13. Legal Considerations in Urban Design</li> <li>14. Design Requirements of Specific Places in Towns &amp; Cities.             <ol style="list-style-type: none"> <li>14.1 Cluster Housing and Planned Unit Development (PUD)</li> <li>14.2 Areas for Priority Development (APDs)/ Mixed Use Development and commercial centers</li> <li>14.3 Industrial parks and districts</li> <li>14.4 Planning Educational Campuses</li> <li>14.5 Government Center and the Plaza Complex</li> <li>14.6 Coastal/Lakeside Community Planning</li> <li>14.7 Resort Community Design</li> <li>14.8 Parks and Open Spaces, Recreational Areas</li> </ol> </li> <li>15. Design as a Public Policy</li> </ol>
<p><b>Studio Equipment</b></p>	<p>Audio-visual Equipment</p>
<p><b>Suggested Textbooks and References</b></p>	<p>Suggested References:</p> <p>Urban Design: The American Experience – Lang, Jon 1994          The Image of the City – Lynch, Kevin          Communities within Cities – Davies, W.K.D. / Herbert, D.T.          Extension Space in Architecture -Ashihara          Design of Cities – Bacon, Edmond          Streets and Squares, The Green Dimension, Designing the City (1999) (4 vol.) – Burton, Hugh          Color in Architecture: design Methods for Building Interiors and Urban Spaces – Linton, H.          Urban Landscape Design - Eckbo, Garrett</p>

<b>Course Name:</b>	<b>PLANNING 3 – INTRODUCTION TO URBAN AND REGIONAL PLANNING</b>
<b>Course Description</b>	Concepts & emerging trends, methods & techniques in urban and regional planning; design of human settlements, and overview of land use in the planning of regions.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 Hrs.
<b>Prerequisite</b>	:Planning 2
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. have a general understanding of the planning process;</li> <li>2. understand the basic foundation of planning;</li> <li>3. have a boarder framework upon which the student in architecture can foresee the implication of specific projects;</li> <li>4. learn useful planning techniques relevant to the rank of the architect as a design professional;</li> <li>5. to relate history &amp; theories of urban &amp; regional planning to ecology &amp; sustainable development.</li> <li>6. understand the current thoughts and practices with regards to plan formulation &amp; implementation;</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1.0 Introduction: Humans in their ecological setting</li> <li>2.0 Ekistics: The Science of Human Settlements</li> <li>3.0 Location Theory: The Foundation of Planning</li> <li>4.0 Definition of Planning</li> <li>5.0 Historical Overview and Influences</li> <li>6.0 Basic Planning Concepts</li> <li>7.0 Overview of Urban and Regional Planning Theories and Issues: Implications to Architectural Practice</li> <li>8.0 The Comprehensive Planning Process</li> <li>9.0 Planning of Particular Projects <ol style="list-style-type: none"> <li>9.1 Land Use Planning</li> <li>9.2 Physical Planning</li> <li>9.3 Transportation and Public Facilities Planning (Infrastructure)</li> <li>9.4 Environmental Planning (Agrarian, Forest, Coastal)</li> <li>9.5 Tourism Planning</li> <li>9.6 Historic Preservation</li> <li>9.7 Fiscal Planning</li> </ol> </li> <li>10.0 Plans related to urban and regional planning</li> <li>11.0 The State of Philippine Urban and Regional Planning</li> <li>12.0 Institutions in Planning</li> <li>13.0 Pertinent Planning Laws ( HLURB Guidelines, BP 957, NEDA, Local Government Units, MMDA, DILG, NHA, etc.)</li> <li>14.0. Environmental Impact Assessment</li> <li>15.0 Current State, Challenges and Issues</li> </ol>

<b>Studio Equipment</b>	Audio visual requirement
<b>Suggested Textbooks and References</b>	<p><i>Suggested References:</i></p> <p>Sustainable Cities (2003) McGraw Hill Publication  Toward Sustainable Development (2002) – Lawn, Joseph  Introduction to Planning - Earnest Alexander 2<sup>nd</sup> ed. 1993  Introduction to Urban Planning - Catanese, Joseph (latest edition)  Introduction to Urban and Regional Planning - Hall, Peter  Possible Urban Worlds INURA (2000)  Time-Saver Standards in Urban Planning - De Chiara, et al  HLRB Planning Guides  National Urban Development and Housing Framework Report- HLRB  Urban Development and Planning in Metro Manila -MMDA</p>

<b>Course Name:</b>	<b>COMPUTER-AIDED DESIGN &amp; DRAFTING FOR ARCHITECTURE 1</b>
<b>Course Description</b>	A basic introduction on computer and software programs useful in architectural practice. The course deals with aspects of architectural 2D & 3D drafting and design.
<b>Number of Units for Lecture and Studio</b>	Lecture – 1 unit Studio - 2 units
<b>Number of Contact Hours per week</b>	6 hours (minimum) Lecture - 1 hr. Studio - 6 hrs.
<b>Prerequisite</b>	Architectural Visual Communications 5
<b>Course Objectives</b>	At the end of the term, the student should be able to – <ol style="list-style-type: none"> <li>1. Prepare plans, elevations, sections and other 2D drawings.</li> <li>2. Prepare 3D architectural drawings.</li> <li>3. Prepare computer-aided architectural perspectives.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to CADD.</li> <li>2. Paper Space / Settings / Basic Commands.</li> <li>3. Layering / Text / Dimensioning</li> <li>4. Introduction to Industry- Standards</li> <li>5. Setting up icons and commands in 3D.</li> <li>6. Manipulating user coordinate system (UCS).</li> <li>7. 3D Surfaces and Solids</li> <li>8. Architectural components in 3D.</li> <li>9. Computer-Aided perspective.</li> <li>10. Rendering</li> <li>11. Plotting</li> </ol>

<b>Laboratory Equipment</b>	1. Computer workstations Class size (1 computer: 1 student ratio) 1.2.1 Ideal - 20 students 1.2.2 Maximum - 40 students 2. One (1) Plotter 3. One (1) Scanner 4. One (1) Printer 5. One (1) LCD projector
<b>Textbooks and References</b>	Current CADD books available

<b>Course Name:</b>	<b>COMPUTER-AIDED DESIGN &amp; DRAFTING FOR ARCHITECTURE 2</b>
<b>Course Description</b>	An advanced computer-aided architectural rendering, modeling and animation using current software.
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio - 2 units
<b>Number of Contact Hours per week</b>	<i>6 hours (minimum)</i> Lecture - 1 hour Studio - 6hrs.
<b>Prerequisite</b>	<b>Computer-Aided Design &amp; Drafting For Architecture 1</b>
<b>Course Objective</b>	At the end of the term, the student should be able to – 1. Prepare 3D architectural drawings and perspectives. 2. Prepare computer-aided architectural perspective renderings. 3. Prepare computer-aided walkthroughs and animations.
<b>Course Outline</b>	1. Introduction: Building Modeling 2. User Interface 3. Conceptual Design using Massing 4. Designing with Components 5. Detailing 6. Rendering 7. Creating and Editing Walkthroughs 8. Importing and Linking Files
<b>Studio Equipment</b>	1. Computer workstations Class size (1 computer: 1 student ratio) 1.2.1 Ideal - 20 students 1.2.2 Maximum - 40 students 2. One (1) Plotter

	<ol style="list-style-type: none"> <li>3. One (1) Scanner</li> <li>4. One (1) Printer</li> <li>5. One (1) LCD projector</li> </ol>
<b>Textbooks and References</b>	All current CADD books available

<b>Course Name:</b>	<b>RESEARCH METHODS FOR ARCHITECTURE</b>
<b>Course Description</b>	Quantitative and operational methods in architectural design research activity, requirement in use analysis
<b>Number of Units for Studio</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs
<b>Prerequisite</b>	<b>Junior standing, English 3-Technical Report Writing</b>
<b>Course Objectives</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. Apply workable research methods and procedures</li> <li>2. Acquire basic research skills</li> <li>3. Obtain a broader framework upon which the requirements and implications of specific projects are foreseen</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Overview and introduction to the course</li> <li>2. Research definitions, types, importance, etc.</li> <li>3. Methodologies/tools and techniques in research: <ol style="list-style-type: none"> <li>3.1 Research Design</li> <li>3.2 Sampling Design</li> <li>3.3 Data Collection Methods</li> <li>3.4 Data Processing and Tabulation</li> <li>3.5 Basic Statistics</li> <li>3.6 Data Analysis and interpretation</li> </ol> </li> <li>4. Preparation of a thesis proposal <ol style="list-style-type: none"> <li>4.1 The research problems and objectives</li> <li>4.2 The research report : Writing the research proposal</li> <li>4.3 Consolidation and Final evaluation</li> </ol> </li> </ol>
<b>Studio Equipment</b>	None
<b>Suggested Textbooks and References</b>	<p>Any book in Thesis Writing:</p> <ol style="list-style-type: none"> <li>1. <b>Methods &amp; Technique of Research</b>, C.A. Sanchez, Ph.D.</li> <li>2. <b>Research Method</b>, Consuelo G. Sevilla Ed.D., Jesus A. Ochave</li> <li>3. <b>Research &amp; Thesis Writing</b>, Jose Arias Ade</li> </ol> <p><b>4. Architectural Research Methods</b></p>

<b>Course Name:</b>	<b>TROPICAL DESIGN</b>
<b>Course Description</b>	Techniques for the design and planning of buildings within the technological and social constraints prevailing in the hot-humid tropics.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs.
<b>Prerequisite</b>	Physics 2
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the significance of climate in the design process;</li> <li>2. illustrate the different processes and instruments that may be applied in a climate-responsive design;</li> <li>3. explain the different concepts and theories of tropical design;</li> <li>4. Apply the different tropical design concepts in an architectural design problem.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Climatic Design Factors</li> <li>2. Introduction to Environmental/ Climatic Design</li> <li>3. History and Background</li> <li>4. Types of Climates and Corresponding Characteristics</li> <li>5. Climatic Data and Analysis</li> <li>6. Comfort: Concepts, Indices and Analysis</li> <li>7. Climatic Concepts, Elements and Factors</li> <li>8. Microclimatic Considerations</li> <li>9. Tropical Design Theories</li> <li>10. Tropical Climates: Hot, Humid Climates Characteristics Design Problems Design Objectives</li> <li>11. Tropical Climates: Hot, Dry Climates 11.3 Characteristics 11.2 Design Problems 11.3 Design Objectives</li> <li>12 General Concepts: Low Rise Design Design Objectives Design Strategies General Concepts in Ventilation</li> <li>12.4 Sun Protection</li> <li>12.5 The Site &amp; Building Layout</li> <li>12.6 Space Planning</li> <li>13. Building Elements Building Materials</li> <li>14. Tropical Design Problem (Application) Discussion of Design Brief and Design Considerations Design Theories Discussion</li> </ol>

<b>Studio Equipment</b>	Audio-visual equipment, compass, etc.
<b>Suggested Textbooks and References</b>	

<b>Course Name:</b>	<b>HOUSING</b>
<b>Course Description</b>	Socio-Cultural and Institutional Challenges for Effective Delivery of Housing in the Phil.
<b>Number of Units for Lecture and Studio</b>	Lecture - 3 Units
<b>Number of Contact Hours per week</b>	Lecture - 3 Hrs.
<b>Prerequisite</b>	Planning 2, Professional Practice 1
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the basic issues relative to housing and its effective delivery;</li> <li>2. acquire a more rational basis for housing design;</li> <li>3. familiarize the relevant laws and codes pertaining to housing delivery.</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to Housing <ul style="list-style-type: none"> <li>Housing and the delivery process</li> <li>Physical configurations as outcomes of socio-economic systems</li> </ul> </li> <li>2. Philippine Perspective on Housing <ul style="list-style-type: none"> <li>Current Housing Needs, Demand and Supply</li> </ul> </li> <li>3. Cultural Beliefs in Housing: Regional Characteristics</li> <li>4. Housing Typologies</li> <li>5. Theories on Housing</li> <li>6. Comprehensive Approach to Housing <ul style="list-style-type: none"> <li>Behavioral Aspects of Housing</li> <li>Economic and Social Challenges of Housing</li> <li>Organizational and Institutional Challenges for Effective Housing Delivery Systems</li> <li>Community Development Aspect of Housing</li> </ul> </li> <li>7. Market Analysis and Housing Finance</li> <li>8. Technological Issues in Mass Housing (Housing Technology)</li> <li>9. Housing Beyond the Shelter</li> <li>10. The Evolution of Philippine Housing Policy and Institutions</li> <li>11. Current Issues and Future Trends in Housing</li> </ol>
<b>Studio Equipment</b>	Audio-visual equipment

<b>Suggested Textbooks and References</b>	<p><i>Suggested References:</i></p> <p>Philippine Shelter System and Human Settlements – Ministry of Human Settlements  Site Planning Standards for Residential Developments – De Chiara &amp; Koppelman  Time-Saver Standards in Urban Planning - De Chiara, et al  HLRB Planning Guides  National Urban Development and Housing Framework Report- HLRB</p>
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### **F. ARCHITECTURE COMPREHENSIVE COURSE**

<b>Course Name</b>	<b>ARCHITECTURE COMPREHENSIVE COURSE</b>
<b>Course Description</b>	<p>The architecture comprehensive course provides an opportunity for each student to show evidence of his or her ability to synthesize information through learning acquired from the following subject areas: Theory of Architecture; History of Architecture; Architectural Interiors, Building Technology; Building Utilities; Urban Planning; Architectural Design; Engineering Sciences; and Professional Practice.</p>
<b>Number of Units</b>	Lecture – 3 Units
<b>Number of Contact Hours per Week</b>	Lecture – 3 hours
<b>Prerequisite</b>	<p>Completion of all courses covered in each module. Please refer to the Course Modules shown below.</p> <p>Note: As an option, a school may offer the Comprehensive Course in progressions of two or three courses of 1.5 units or 1.0 unit each, respectively, in lieu of a one time offering of 3 units depending on the curriculum structure adopted. However, ensuing courses must only be offered to students who have at least completed all courses in the 4<sup>th</sup> year level.</p>
<b>Course Objectives</b>	<p>At the end of the course, the student must be able to:</p> <ol style="list-style-type: none"> <li>1. analytically relate history and theories of architecture, technologies and human sciences to current issues on development;</li> <li>2. critically understand the fundamentals of building systems and utilities;</li> <li>3. effectively apply the rudiments of professional practice; and</li> <li>4. exhibit evidence of his or her profound understanding of architecture through knowledge acquired during the course of study resulting in passing the comprehensive examinations given after each module.</li> </ol>
	<p>Module 1:  Review covering the progression of courses in Theory of</p>

<b>Course Modules</b>	<p>Architecture; History of Architecture; Architectural Interiors; Building Technology and Building Utilities.</p> <p>Module 2: Review covering the progression of courses in Urban Planning; Architectural Design 1 to Architectural Design 8</p> <p>Module 3: Review covering the progression of courses in Engineering Sciences and Professional Practice</p>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	Please refer to the list of textbooks and references per course.

### **G. SPECIALIZATION COURSES**

<b>Course Name:</b>	<b>COMMUNITY PLANNING DEVELOPMENT</b>
<b>Course Description</b>	Introduction to the study of the community, focusing on community organization, ecology and major social institutions and groups within the community services is discussed within the context of patterns of community interaction, processes and dynamics.
<b>Number of Units for Lecture and Studio</b>	Lecture -3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hrs.
<b>Prerequisite</b>	Planning 2
<b>Course Objectives</b>	<p>At the end of the course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. to understand the basic concepts in the field of community development and illustrate community processes through case study materials</li> <li>2. understand community organizations, ecology, social institutions and groups within the community and their implications to community planning development</li> <li>3. develop sensitivity to patterns of interaction within the community dynamics</li> <li>4. explore approaches in community planning to answer the communities' spatial needs and to reflect their collective aspiration</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1. Introduction to Community Development</li> <li>2. Definition of a Community</li> <li>3. Elements of Community Structure</li> <li>4. Community Processes, Dynamics and Empowerment</li> <li>5. Community Development Planning Approaches</li> <li>6. Case Studies in Community Development</li> <li>7. Laws Related to Community Planning Development</li> <li>8. Issues in Community Development Planning in the Philippines</li> <li>9. Skills in Community Planning Facilitation</li> </ol>

<b>Studio Equipment</b>	Audio-visual equipment
<b>Suggested Textbooks and References</b>	Communities within Cities - WKD Davies/DT Herbert 1993 Co-Design: A Process of Design Participation - Stanley Ring, et. al National Urban Development and Housing Framework Report- HLRB

<b>Course Name:</b>	<b>URBAN DESIGN STUDIO</b>
<b>Course Description</b>	Design exercises on complex design problems in real urban settings
<b>Number of Units for Lecture and Studio</b>	Lecture - 1 unit Studio- 2 units
<b>Number of Contact Hours per week</b>	Lecture - 1 hour Studio - 6 hrs
<b>Prerequisite/Co-requisite</b>	Architectural Design 7, Planning 2
<b>Course Objectives</b>	At the end of the course, the student will be able to: <ol style="list-style-type: none"> <li>1. To consolidate lessons learned from prior design and community planning courses</li> <li>2. To collaborate with other students in a large-scale and complex project in the urban area</li> </ol>
<b>Course Outline</b>	<ol style="list-style-type: none"> <li>1.0 Introduction to Urban Design</li> <li>2.0 Urban Design Concepts</li> <li>3.0 Urban Design Process and Techniques</li> <li>4.0 Urban design documentation workshop: the system of design &amp; process of presentation</li> <li>5.0 Pertinent Laws</li> <li>6.0 Application of Concepts and Techniques to an Urban Design Problem Situation <ol style="list-style-type: none"> <li>6.1 Design Brief and Design Considerations</li> <li>6.2 Design Theories Discussion</li> </ol> </li> </ol>
<b>Studio Equipment</b>	<ol style="list-style-type: none"> <li>1. Drafting Tables and Chairs</li> <li>2. Drafting Equipment</li> </ol>
<b>Suggested Textbooks and References</b>	<p>Suggested References</p> <p>Introduction to Urban Planning - Catanese, Joseph (latest edition) Time Saver Time-Saver Standards in Urban Planning - De Chiara, et al HLRB Planning Guides</p>

<b>Course Name:</b>	<b>CONSTRUCTION MANAGEMENT</b>
<b>Course Description</b>	This course is about methodologies and tools necessary for each aspect of construction project life-cycle broken into organizing, planning, monitoring, and controlling, as well as the theories upon which these are built. Students will learn about cost and risk control, developing and applying policies and procedures as well as subcontractor management, purchasing and project financing.
<b>Number of Units for Lecture and Laboratory</b>	Lecture - 3 units
<b>Number of Contact Hours per week</b>	Lecture - 3 hours
<b>Prerequisite</b>	Building Technology 5, Professional Practice 3
<b>Course Objectives</b>	<p>At the end of the course, the student must be able to:</p> <ul style="list-style-type: none"> <li>5.1. Know how to apply basic management ideas, principles and skills to the management of a construction project.</li> <li>5.2. Know how to participate in project pre-construction planning activities to get the project off to a good start.</li> <li>5.3. Be able to show the organizational structure of the project by using an organization chart.</li> <li>5.4. Understand the role of planning and scheduling in the pre-construction phase of a construction project.</li> <li>5.5. Use test models and pilot studies for planning field work.</li> <li>5.6. Plan crew size and crew activities for key construction operations.</li> <li>5.7. Participate in project layout and start up.</li> <li>5.8. Plan for efficient material handling.</li> <li>5.9. Understand the role that computers play in modern construction management and project cost control.</li> <li>5.10. Apply subcontractor management techniques</li> <li>5.11. Coordinate the close out of a construction project</li> <li>..</li> </ul>
<b>Course Outline</b>	<ul style="list-style-type: none"> <li>7. Introduction to Construction Management</li> <li>8. Pre-Construction Planning - Getting Started <ul style="list-style-type: none"> <li>2.1 Project organization</li> <li>2.2 Design Structure Matrix</li> </ul> </li> <li>3. Developing the Project Plan <ul style="list-style-type: none"> <li>3.1 Work Breakdown Structure</li> <li>3.2 Project Budget and Cost Breakdown Structure</li> <li>3.3 Scheduling and Risk Analysis <ul style="list-style-type: none"> <li>3.3.1 The Critical Path Method (CPM)</li> <li>3.3.2 The Precedence Diagramming Method (PDM)</li> <li>3.3.3 The Program Evaluation and Review Technique (PERT)</li> <li>3.3.4 The Graphical Evaluation and Review Technique (GERT)</li> <li>3.3.5 Queue - Graphical Evaluation and Review Technique</li> </ul> </li> </ul> </li> </ul>

	<p>(GERT)</p> <p>3.3.6 Simulation Language for Alternative Modelling (SLAM)</p> <p>3.3.7 Dynamic Planning and Control Methodology (DPM)</p> <p>3.3.8 Critical Chain Planning</p> <p>3.3.9 Resource Loading</p> <p>4. Planning for Production</p> <p>    4.1 Resource Allocation</p> <p>5. Planning for Project Layout</p> <p>6. In The Field - Starting Up the Project</p> <p>7. Project Monitoring</p> <p>    7.1 Earned value Monitoring</p> <p>    7.2 Cost and Risk Control</p> <p>    7.3 Monitoring and Info. System</p> <p>    7.4 Quality Assurance</p> <p>    7.5 Conflict Management</p> <p>8. Project Control</p> <p>    8.1 Subcontractor Management</p> <p>    8.2 Project Crashing</p> <p>    8.3 Change Management</p> <p>    8.4 Critical Chain</p> <p>9. Purchasing, Expediting, and Receiving</p> <p>10. Project Completion and Close-out</p> <p>11. Project Learning</p> <p>    11.1 Life Cycle and Post Mortem Analysis</p> <p>    11.2 Methodology for Performance Evaluation</p>
<b>Laboratory Equipment</b>	None
<b>Suggested Textbooks and Reference Materials</b>	<p>8. Project Management: <i>A Managerial Approach</i> Fourth Edition, Jack R. Meredith and Samuel J. Mantel, (John Wiley and Sons, 1995)</p> <p>9. Managing the Construction Process Estimating, Scheduling and Project Control, Frederick Gould (Pearson, 2002)</p> <p>10. Introduction to Engineering Construction Inspection, Edward Fisk (Wiley, 2004)</p> <p>11. Management of Construction Projects: A Constructor's Perspective, John Schauerberger and Len L. Holm (Pearson, 2002)</p> <p>12. Managing Construction Equipment, S. W. Nunnally (Pearson, 2000)</p> <p>13. Construction Jobsite Management, William R. Mincks (Thomson Delmar Learning, 2004)</p> <p>14. Project Management software: Microsoft Project, Primavera Suretrack, or other</p> <p>15. Critical Chain, Goldratt, North River, 1997</p>

*Nothing follows.*