Course details: 1st Year Even Semester

ECE 1201 Circuits and Systems II Credits : 3
Poly phase system: balanced and unbalanced three phase circuit analysis.
Two-port network analysis. Coupled circuit. Analogous system, Response to non-sinusoidal voltage.
Linear system: Transform methods, Purpose and nature of transform, Fourier and Laplace transforms. Impulse function. Convolution integral and their application to network and system analysis.
Filter: Introduction to filter, Filter equations, Modern filters.

ECE 1202 Circuits and Systems II Sessional Credits : 0.75
Sessional based on the theory of course ECE 1201.

ECE 1203 Object Oriented Programming Credits : 3
Fundamentals of OOP: Introduction to Object Oriented Programming, Principles of Object Oriented Design, Encapsulation and Information-hiding, Inheritance, Polymorphism, Data binding, Static and Dynamic binding.
Classes and Objects: Structure of Class, Access Modifiers, Nested Classes, Abstract Classes, Arrays of Objects, Pointer to Objects, Friend function, Data abstraction.
Constructors and Destructors: Default constructor, Copy constructor, Dynamic constructor, Constructor function for derived class and their order of execution, Destructor.
Inheritance: Single inheritance vs. multiple inheritance, Mode of inheritance, Virtual inheritance.
Polymorphism: Operator and Function overloading, Run-time and Compile time Polymorphism, Virtual function, Errors and Exception Handling.
Advanced Topics: Persistent Objects, Objects and Portable Data, UML Basics, Design Patterns, Multithreading.

ECE 1204 Object Oriented Programming Sessional Credits : 1.5
Sessional based on the theory of course ECE-1203.

ECE 1205 Analog Electronic Circuits -I Credits : 3
Signal: Signals, their origin and processing in electronic system. Development of electronic processing devices; Vacuum tubes and semiconductor devices; P-N junction semiconductor diodes; Application of diode as rectifier, Zener diode and its application.
BJT, FET, MOSFET : Characteristics, Biasing techniques, Stabilization factors, Compensation. Equivalent circuits, single stage amplifiers at midband frequencies. Power amplifiers and Heat sink.

ECE 1206 Analog Electronic Circuits-I Sessional Credits : 0.75
Sessional based on the theory of course ECE-1205.

Math 1217 Differential Equations Credits : 3
Ordinary Differential Equation: Degree and order of ordinary differential equations. Formation of differential equations. Solutions of first order differential equations by various methods, Solutions of general linear differential equations of second and higher orders with constant coefficients, Solution of homogeneous linear differential equations. Solution of higher order differential equations when the dependent of independent variables are absent. Solution of differential equation with constant coefficients by operator method. Differential equations with variable coefficients.
Partial differential equations: Four rules for solving simultaneous equations of the form $P = Q = r$; Lagrange's
method of solving PDE of order one, Integral surfaces passing through a given curve, Non linear PDE of order one (Complete, Particular, Singular and general integrals), Charpit's method, Second order PDE; Its nomenclature and classifications to canonical (Standard) parabolic, elliptic, hyperbolic, Solution by separations of variables, Linear PDE with constants coefficients.
Series solution: Solution of differential equations in series by the method of Frobenius, Bessel's functions, Legendre's Polynomials and their properties.

Hum 1217 Economics, Government & Sociology Credits : 3
Economics: Nature of the economics theory applicability of economic theory to the problems of developing countries, Some basic concepts supply, demand and their elasticity. Economics and technology. Producer's equilibrium-isoquant. Production - factors of production, production possibility curve-equilibrium of a firm, fixed cost and variable cost, laws of returns ,internal and external economics and dis-economics, Input output analysis. Economic growth and economic development and planning basic concept-saving, investment, GNP, NNP, per-capita income, growth rate, Fiscal policy, monetary policy and trade policy and their relative applicability in Bangladesh, Planning- Five year plans of Bangladesh, development problems related to agriculture. Industry and population of Bangladesh.
Government: Basic concepts of government and politics. Functions, Organs and forms of modern state and Government, Socialism. Capitalism, UNO, government and politics of Bangladesh, Some major administrative systems of developed counties. Local self - government. Central government, Public opinion.
Sociology: Scope, Culture and civilization Relationship, Social structure of Bangladesh. Industrial revolution, Urbanization and industrialization, Urban Ecology, Cyber crime and delinquency, Sociology of Education. Relationship-Sociology and cyber crime. Causes and remedies of cyber crime.

ECE 1200 Electrical Shop Practice Credits : 1.50
Electrician's tools, splices, soldering, code practices. Electrical and electronic symbols, Safety rules, electricity rules and electricity codes. Electrical wiring system design drawing and estimation for residential and commercial house wiring and Industrial installation wiring. Use of meggers, Insulation test, Grounding earth resistance measurement using earth resistance tester. Battery charging.