FIRST YEAR			1ST SEMESTER (HOURS/WEEK)			2ND SEMESTER (HOURS/WEEK)		
CODE	**SUBJECT**	**UNITS**	**THEO.**	**TUT.**	**LAB.**	**THEO.**	**TUT.**	**LAB.**
GS101	DEMOCRACY AND HUMAN RIGHTS	2	1	-	-	1	-	-
GS102	ENGLISH LANGUAGE I	2	1	-	-	1	-	-
GS103	COMPUTER I	2	1	-		1	-	
GS104	SPORT EDUCATION	Sat.	-	-	-	-	-	-
ECE101	MATHEMATICS I	6	3	1	-	3	1	-
ECE102	LOGIC CIRCUITS	4	2	-	-	1	1	2
ECE103	ELECTRONICS I	6	3	1	-	3	1	-
ECE104	COMPUTER PROGRAMMING I	4	1	1	2	1	1	2
ECE105	ELECTRICAL CIRCUITS I	6	3	1	-	3	1	-
ECE106	ENERGY CONVERSION	3	2	-	-	1	1	-
ECE107	WORKSHOP OF ELECTRONICS	2	-	1	2	-	1	2
ECE108	ELECTRICAL MEASUREMENTS LAB.	3	-	-	3	-	-	3
TOTAL UNITS		**40**	**17**	**5**	**7**	**15**	**7**	**9**
TOTAL HOURS PER WEEK			**29**			**31**		

CLASS	**FIRST**			***THEORY***	3	**Hrs./Week**
SUBJECT	**MATHEMATICS I**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 101	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Calculus Prerequisites	Coordinates Systems: distance between two points, graphs, and symmetry; Slope and Line Equation; Functions and Their Graphs: intervals, domain and range, integer-valued functions, function defined in pieces and compositions of functions; Circles, Parabolas, and Shift of Graphs; Review of Trigonometric Function: definition and identities; Absolute Value and Target Value.	12
Complex Numbers	Addition, Subtraction, Multiplication, Division, and Complex Conjugate; Polar Form: conversion from rectangular to polar and vice versa, multiplication and division in polar form.	12
Matrices and Determinants	Definition of Matrix, Determinants, Minors, and Cofactors; Some Useful Properties of Determinants; Matrix Multiplication; System of Linear Equations; Cramer's Rule.	12
Limits and Continuity	Limits and Their Properties; Right-Hand and Left-Hand Limits; Sandwich Theorem; Limits Involving Infinity, Changing Variables; Continuous Functions and Continuity Test.	12
Derivatives	Slope of Tangent, Rate of Change of Function, and Definition of Derivative; Differentiation Rules; Derivative of Trigonometric Functions; The Chain Rule; Implicit Differentiation and Derivatives of Higher Order; Linear Approximation; Newton's Method for Approximating Solutions of Equations.	12
Application of Derivatives	Related Rate of Change; Maxima, Minima, and Mean Value Theorem; Curve Sketching with y' and y": maximum points, minimum points, points of inflection, rise and fall and concavity; Graphing of Rational Functions: horizontal, vertical, and oblique asymptotes.	12
Integration	Area Under the Curve and Definition of Integration; Finite Sums and Sigma Notation; Definite Integral and Rules of Definite Integral; Indefinite Integral; Differential Equations and Initial Value Problem; Integration by Substitution; Numerical Integration: Trapezoidal rule and Simpson's rule; Logarithms and Exponentials: the natural logarithm ($ln\ x$) and the exponential function (e^x); Rules of Logarithms and Exponential, Derivatives, and Integral of Logarithms and Exponentials; Application: capacitor discharge current.	12

Application of Definite Integral	Area between Curves: curves that cross, boundaries with changing formulas, integration with respect to y and geometric evaluation of some integrals; Volume of Solids of Revolution: disks and washers; Cylindrical Shells; Length of Curves (arc length); Area of Surface of Revolution.	12
The Calculus of Transcendental Function	Inverse Functions and their Derivatives; Logarithmic Differentiation; General Exponential and Logarithmic Functions: derivatives, integral, and logarithmic equations; L'Hopital's Rule; Rate at which Functions Grow: relative rate of change; Inverse Trigonometric Functions; Derivatives of Inverse Trigonometric Functions; Hyperbolic Functions: definition and identities, derivatives and integrals, inverse hyperbolic functions.	12
Techniques of Integration	Algebraic Procedure and Trigonometric Identities: completing the square and reducing fractions; Integration by Parts: repeated use, tabular integration, and solving for unknown integral; Trigonometric Integrals: integral of power of *sin x*, *cos x*, *tan x*, and *sec x*, eliminating the square; Trigonometric Substitutions: integrals involving $\sqrt{a^2-u^2}$, $\sqrt{a^2+u^2}$, $\sqrt{u^2-a^2}$, a^2+u^2, and ax^2+bx+c; Rational Functions and Partial Fractions; Improper Integral.	12
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**THOMAS' CALCULUS**
	AUTHOR	**Joel R. Hass, Christopher Heil, and Maurice D. Weir**
	EDITION	**14th Edition**
	YEAR	**2018**
REFERENCE(S)	**-**	

CLASS	**FIRST**			***THEORY***	2	**Hrs./Week**
SUBJECT	**LOGIC CIRCUITS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 102	UNITS	4	***LABORATORY***	2 *	**Hrs./Week**

* LABORATORY IS STUDIED DURING THE SECOND SEMESTER ONLY.

ARTICLE		**HOURS**
Number Systems	Decimal Numbers; Binary Numbers; Decimal to Binary Conversion; Binary Arithmetic; 1st and 2nd Complements of Binary Numbers; Hexadecimal Numbers; Octal Numbers.	10
Codes	Binary Coded Decimal (BCD); Digital Codes: Gray code, ASCII code, Unicode.	10
Logic Gates	The Inverter; The AND Gate; The OR Gate; The NAND Gate; The NOR Gate; The Exclusive OR and Exclusive NOR Gates.	8
Boolean Algebra and Logic Simplification	Boolean Operations and Expressions; Laws and Rules of Boolean Algebra; DeMorgan's Theorems; Boolean Analysis of Logic Circuits; Simplification Using Boolean Algebra; Boolean Expressions and Truth Tables; The Karnaugh Map.	10
Combinational Logic Analysis	Basic Combinational Logic Circuits; Implementing Combinational Logic; Universality of the NAND Gate; Basic Adders; Parallel Binary Adders; Comparators; Decoders; Encoders; Code Converters; Multiplexers; Demultiplexers; Parity Generators/Checkers.	10
Basic Sequential Circuits	Latches; Edge-Triggered Flip Flops; S-R, T, D, and J-K Flip Flops Operating Characteristics; Flip Flop Applications.	10
Counters	Asynchronous Counters; Synchronous Counters; Up-Down Synchronous Counters; Design of Synchronous Counters; Cascaded Counters.	8
Shift Registers	Basic Shift Register Operation; Serial (Parallel) In/Serial (Parallel) Out Shift Registers; Bidirectional Shift Register; Shift Register Counters; Shift Register Applications.	9
TOTAL HOURS		75

TEXT BOOK(S)	**TITLE**	**DIGITAL FUNDAMENTALS**
	AUTHOR	**THOMAS L. FLOYD**
	EDITION	**10th Edition**
	YEAR	**2008**
REFERENCE(S)	**DIGITAL DESIGN BY M. MORRIS MANO**	

CLASS	**FIRST**			***THEORY***	3	**Hrs./Week**
SUBJECT	**ELECTRONICS I**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 103	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Atomic Structure	Atom, Nucleus, Atomic Number, Atomic Mass; Isotopes	12
Electronic Structure of an Atom		8
Conduction in Metals and Semiconductors		10
P-N Junction Operation and Characteristics		10
Diodes	Diode Equation; Ideal Diode; V-I Characteristics of Ideal Diode; Diode Forward and Reverse Bias; Diode Models: Ideal Diode, Constant Voltage Drop Model, Two Straight Lines Model.	16
Rectifier Circuits	Half Wave Rectifier: Half Wave Rectifier Considering Ideal Diode, Half Wave Rectifier Considering Constant Voltage Drop Diode Model, Half Wave Rectifier Considering Two Straight Lines Diode Model; Full Wave Rectifier; Full Wave Rectifier Using Transformer with Center Tap; Bridge Rectifier; Filter; Voltage Regulator; Limiter or Clipper Circuits; Clamping Circuits.	16
Zener Diode	Equivalent Circuit of Zener Diode; Zener Diode as Voltage Regulator.	8
Logic Circuits using Diodes		8
Special Diodes	Schottky Diode; Varactor Diode (Varicap); Tunnel Diode; Photo Diode; Light-Emitting Diode (LED).	12
Transistors	Transistor Operation; Common Base (CB) Transistor Amplifier; Common Emitter (CE) Transistor Amplifier; CB Transistor Amplifier Current Amplification; CE Transistor Amplifier Current Amplification; Analysis of Transistor Circuit at DC; DC Biasing of a Transistor: fixed bias circuit, bias circuit with emitter resistor, DC bias circuit independent of β, DC bias with voltage feedback.	20
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**ELECTRONICS DEVICES AND CIRCUITS**
	AUTHOR	**JACOB MILLMAN**
	EDITION	**1ST Edition**
	YEAR	**1967**
REFERENCE(S)	**ELECTRONIC DEVICES AND CIRCUIT THEORY**	

CLASS	**FIRST**			***THEORY***	1	**Hrs./Week**
SUBJECT	**COMPUTER PROGRAMMING I**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 104	UNITS	4	***LABORATORY***	2	**Hrs./Week**

ARTICLE		**HOURS**
Introduction to the Computer System		2
Programming Language Types	High level languages; low level languages	2
Algorithms And Flow Charts		4
BASIC Programming Language	Introduction; Constants and Variables in BASIC Language; Arithmetical, Relational, and Operations in BASIC Language	10
BASIC Statements	LET statement; REM statement; input/output statements: READ/DATA statement, INPUT statement, PRINT statement; Control statements: unconditional GOTO statement, conditional ON/GOTO statement, IF-THEN statement.	10
Subscripted Variables	DIM Statement; Vector Operation; Matrix Operation	4
Visual Basic Language	Introduction; Steps to Create an Application; Properties; Methods; Events; Working with Visual Basic Window; Project Explorer Window; Properties Window; Form Layout Window; Tool Box.	10
Standard Tool Box Controls	FORM window; Controls: Command Button, Label, Text Box, Check Box, Option Button, Frame, List Box, Combo Box, Hscroll Bar, Vscroll Bar, Timer, Drive List Box, Dir List Box, File List Box, Picture Box, Image, Line, Shape.	10
Data Types In Visual Basic	Levels of Data Definition; Scope of Procedure; Procedure Type; Select Case Statement; Conditional Looping Statements; With/End Statement; Call Statement; Arrays	8
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**VISUAL BASIC PROGRAMMING REFERENCE**
	AUTHOR	**ROD STEPHENS**
	EDITION	**1ST Edition**
	YEAR	**2012**
REFERENCE(S)	**-**	

CLASS	**FIRST**			***THEORY***	3	**Hrs./Week**
SUBJECT	**ELECTRICAL CIRCUITS I**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 105	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Basic Concepts	Units and Notations; Current, Voltage, and Resistance; Ohm's Law.	8
Series, Parallel, and Series-Parallel Resistive Circuits.		10
D.C. Network Analysis Techniques	Voltage Sources and Current Sources; Source Transformation; Kirchhoff's Laws; Mesh and Nodal Analysis	10
Delta-Star Transformation	Star to Delta and Delta to Star Transformations.	8
D.C. Network Theorems	Superposition Theorem; Thevenin's Theorem; Norton's Theorem; Millman's Theorem; Maximum Power Transfer Theorem.	10
Bridge circuits Principles and Applications.		8
D.C. Transient Circuits	R-C Circuits; R-L Circuits.	10
A.C. Circuits	Sinusoidal Voltages and Currents; Phase Relations; Average Value and Effective Value; Impedance Calculations: resistor, capacitor, and Inductor A.C. Circuits; Single Phase A.C. Circuits: series and parallel RC, RL and RLC circuits; Complex Numbers; Phasor Diagram and Notation.	10
A.C. Source Transformations	Voltage Sources and Current Sources; Source Transformation.	10
Power Calculations in A.C. Circuits	Power Calculations; and Power Factor; Power factor Correction; Average Power; Apparent Power; Complex Power.	8
A.C. Network Analysis Techniques	Voltage Sources and Current Sources; Source Transformation; Kirchhoff's Laws; Mesh and Nodal Analysis	10
A.C. Delta-Star Transformations	Star to Delta and Delta to Star Transformations.	8
A.C. Network Theorems	Superposition Theorem; Thevenin's Theorem; Norton's Theorem; Maximum Power Transfer Theorem.	10
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**Introductory Circuit Analysis**
	AUTHOR	**Robert Boylestad**
	EDITION	**10TH Edition**
	YEAR	**2002**
REFERENCE(S)	**-**	

CLASS	**FIRST**			***THEORY***	2	**Hrs./Week**
SUBJECT	**ENERGY CONVERSION**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 106	UNITS	3	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Units of Basic Electrical Quantities	SI units; Charge; Force; Work; Power; Electrical potential and e.m.f.; Conductance; Electrical power and energy.	9
Magnetic Circuits	Magnetic fields; Magnetic flux and flux density; Magnetomotive force and magnetic field strength: Biot-Savart law; Permeability and B-H curves; Reluctance; Composite series magnetic circuits; Hysteresis and hysteresis loss.	9
Electromagnetism	Magnetic field due to an electric current; Electromagnets; Force on a current-carrying conductor; Principle of operation of a simple D.C. motor; Principles of operation of a moving-coil instrument; Force on a charge.	9
Electromagnetic Induction	Laws of electromagnetic induction; Rotation of a loop in a magnetic field; Inductance; Inductors; Energy stored; Inductance of a coil; Mutual Inductance.	9
Alternative Voltages and Currents	The A.C. generator; Waveforms; A.C. values.	9
Three-Phase Systems	Three-phase supply; Star connection; Delta connection; Power in three-phase systems.	9
Transformers	Transformer principle of operation; E.m.f. equation of a transformer; Transformer construction; Regulation of a transformer; Three-phase transformers; Voltage transformers.	9
D.C. Machines	The action of a commutator; D.C. machine construction; E.m.f. generated in an armature winding; Shunt, series, and compound windings; D.C. generators; Types of D.C. generator and their characteristics; D.C. motors; Types of D.C. motor and their characteristics.	9
Three-Phase Induction Motors	Production of a rotating magnetic field; Synchronous speed; Slip; Torque equation for an induction motor.	9
Stepper motor		9
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**ELECTRICAL AND ELECTRONIC PRINCIPLES AND TECHNOLOGY**
	AUTHOR	**John Bird**
	EDITION	**2ND Edition**
	YEAR	**2003**
REFERENCE(S)	**-**	

CLASS	**FIRST**			***THEORY***	-	**Hrs./Week**
SUBJECT	**WORKSHOP OF ELECTRONICS**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 107	UNITS	2	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
Electronic Components.	6
Electronic Measurement and Testing Devices	6
Printed Circuit Boards	9
Soldering Techniques	9
Wire Types and Standards	6
PC Construction	9
TOTAL HOURS	45

TEXT BOOK(S)	**TITLE**	**–**
	AUTHOR	**–**
	EDITION	**–**
	YEAR	**–**
REFERENCE(S)	**–**	

CLASS	**FIRST**			***THEORY***	-	**Hrs./Week**
SUBJECT	**ELECTRICAL MEASUREMENTS LAB.**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 108	UNITS	3	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
Introduction to the Lab. Components	9
Ohm's Law	6
Kirchhoff's Laws	6
Star Delta conversions	6
Superposition Theorem	6
Thevenin's and Norton's Theorems	6
Maximum Power Transfer Theorem	6
Transient Response in RL , RC and RLC Circuit	9
A.C. Phase Relationship	6
Diode Characteristics	6
DC. Power supply	6
Clipping and Clamping circuits	6
Zener diode	6
Transistor characteristics	6
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	-
	AUTHOR	-
	EDITION	-
	YEAR	-
REFERENCE(S)	-	

SECOND YEAR			1ST SEMESTER (HOURS/WEEK)			2ND SEMESTER (HOURS/WEEK)		
CODE	**SUBJECT**	**UNITS**	**THEO.**	**TUT.**	**LAB.**	**THEO.**	**TUT.**	**LAB.**
GS201	ARABIC LANGUAGE	1	1	-	-	-	1	-
GS202	ENGLISH LANGUAGE II	2	1	-	-	1	-	-
GS203	COMPUTER II	2	1	-	-	1		-
GS204	SPORT EDUCATION	Sat.	-	-	-	-	-	-
ECE201	MATHEMATICS II	6	3	1	-	3	1	-
ECE202	COMPUTER PROGRAMMING II	4	1	1	2	1	1	2
ECE203	ELECTROMAGNETIC FIELDS	4	2	1	-	2	1	-
ECE204	ELECTRONICS II	6	3	1	-	3	1	-
ECE205	COMMUNICATION THEORY I	4	2	1	-	2	1	-
ECE206	ELECTRICAL CIRCUITS II	2	1	1	-	1	1	-
ECE207	COMPUTER ARCHITECTURE	4	1	1	2	1	1	2
ECE208	ELECTRONICS LAB.	2	-	-	2	-	-	2
ECE209	COMMUNICATION LAB.	2	-	-	2	-	-	2
TOTAL UNITS		**39**	**16**	**7**	**8**	**15**	**8**	**8**
TOTAL HOURS PER WEEK			**31**			**31**		

CLASS	**SECOND**			***THEORY***	3	**Hrs./Week**
SUBJECT	**MATHEMATICS II**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 201	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Infinite Series	Sequences; Concept of Convergence and Divergence; Infinite Series; The Geometric Series and Harmonic Series; The n^{th} Term Test for Divergence; Series without Negative Terms: comparison and integral test; The p-series; Ratio and Root Tests; Alternating Series and Absolute Convergence; Power Series; The Radius and Interval of Convergence; Taylor and Maclaurin Series; Evaluating Non-Elementary Integral.	16
Plane Curves and Polar Coordinates	Conic Sections and Quadratic Equations: circles, parabola, ellipse, and hyperbola; Graph of Quadratic Equations: rotation of axes and eliminating the xy term; Parametric Equations for Plane Curves; The Calculus of Parametric Equations: first and second derivatives, arc length of a parametric curve and area of surface revolution; Polar Coordinates; Graphing in Polar Coordinates; Polar Equations of Lines, Circles, and Cardioids; Integration in Polar Coordinates: area, length of curve, and area of surface revolution.	14
Vectors and Analytical Geometry in Space	Vectors in the Plane; Cartesian Coordinates and Vectors: addition, subtraction, and scalar multiplication; Dot Product: orthogonal vectors, and vector projection; Cross Product: area of parallelogram, test of parallelism, triple product; Equations of Lines and Planes in Space; Distance between a Point and a Line; Distance between a point and a Plane; Angle between Planes and Lines of Intersection of Planes; Cylindrical and Spherical Coordinates.	14
Functions of Two or More Variables and their Derivatives	Functions of Two or More Independent Variables: level curves, contour lines, and level surfaces; Partial Derivatives: f_x, f_y, f_{xx}, f_{yy}, and $f_{xy} = f_{yx}$; The Chain Rule; Directional Derivative and Gradient Vector; Tangent Plane and Normal Lines; Maxima, Minima, and Saddle Points; Lagrange Multipliers.	14
Differential Equations	Separable First Order Equations; Homogenous Equations; Exact Differential Equations; Linear First Order Equations; Second Order Linear Homogenous Equations; Linear Dependence, Linear Independence, and the Wronskian; Second Order Nonhomogenous Linear Equations: variation of parameters, order reduction and undetermined coefficients; Modeling of Forced Oscillation (Electrical Circuits); Euler-Cauchy Equations.	16

Vector-Valued Functions and Motion in Space	Curves in Space, Derivatives, and Integrals; Position Vector, Velocity Vector; Speed and Acceleration Vectors; Modeling Projectile Functions; Directed Distance and Unit Tangent Vector (**T**); Curvature and the **TNB** Frame.	16
Multiple Integral	Double Integral; Areas, Moments, and Centers of Mass; Double Integrals in Polar Forms: changing Cartesian integrals into polar integrals; Triple Integrals in Rectangular Coordinates, Volumes, and Average Values; Masses and Moments in Three Dimensions; Triple Integrals in Cylindrical and Spherical Coordinates; Substitutions in Multiple Integrals, The Jacobian.	16
Vector Analysis	Line Integral; Vector Field, Work, and Flux; Green's Theorem in the Plane; Surface Area and Surface Integral; Divergence Theorem; Stokes' Theorem.	14
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**THOMAS' CALCULUS**
	AUTHOR	**Joel R. Hass, Christopher Heil, and Maurice D. Weir**
	EDITION	**14th Edition**
	YEAR	**2018**
REFERENCE(S)	**-**	

CLASS	**SECOND**			***THEORY***	1	**Hrs./Week**
SUBJECT	**COMPUTER PROGRAMMING II**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 202	UNITS	4	***LABORATORY***	2	**Hrs./Week**

ARTICLE		**HOURS**
Introduction to C++ Programming Language	History of C and C++ Programming Languages; Writing a Simple C++ Program; Preprocessing Directive and Main Function; Using the "*cout*" Object; Learning Basic Data Types with the Size of each Type; Using the Data Types in a C++ Program.	4
Operators and Expressions	Declaring Variables and Variable Initialization; Arithmetic Operations; Increment and Decrement; Main Input and Output Objects (*cin* and *cout*); Mathematical Library Functions.	4
Making Decisions	Relational, Conditional, and Logical Operators; IF Statement; Conditional Expressions; Nested IF; IF-ELSE Ladder; Switch Statement.	4
Program Looping	(while) Loop; (do-while) Loop; Nested Loops; (for) Loop; Using (continue) and (break); using (goto) statement.	4
Arrays and Strings	One Dimensional Arrays and Strings; Reading and Writing Strings; Some (string) Library Functions; The NULL Terminator; Two Dimensional Arrays; Multi-Dimensional Arrays; Array Initialization; Array of Strings.	6
Pointers	Introduction to Pointers; The Pointer Operator; Pointer Expressions and Arithmetic; Pointers and Arrays; Array of Pointers.	4
Functions	Introduction to Modular Programming; Local and Global Values; Defining and Calling Functions; Function Prototype; Passing Data to Functions; Passing Pointers and Arrays; Returning from Functions; Overloading Functions.	6
Structures and Unions	Introduction to Structures; Accessing Structure Members; Array of Structures; Passing a Structure to a Function; Nested Structures; Pointers to Structures and the Arrow Operator; Introduction to Unions.	6
Classes and Objects	Introduction to Classes and Objects; Constructors and Destructors; Array of Objects; Pointers to Objects; Passing Objects to Functions; Returning Objects from Functions; Static Members; Friend to a Class; Operator Overloading; Inheritance; Constructors, Destructors, and Inheritance.	12
Data Files	Introduction to C++ File System; C++ Stream; C++ Stream Classes; Opening and Closing Files; Reading and Writing Text Files; Reading and Writing Blocks of Data.	10
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**STARTING OUT WITH C++**
	AUTHOR	**Herbert Schildt**
	EDITION	**2nd Edition**
	YEAR	**2005**
REFERENCE(S)	**C++ How to Program by Paul Deitel**	

CLASS	**SECOND**			***THEORY***	2	**Hrs./Week**
SUBJECT	**ELECTROMAGNETIC FIELDS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 203	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Vector Analysis	Scalar and Vector Algebra; Cartesian Coordinating System; Vector Components and Unit Vectors; Vector Field; Dot Product; Cross Product; Cylindrical Coordinates; Spherical Coordinates System.	10
Coulomb's Law and Electric Field Intensity	The Experimental Law of Coulomb; Dielectric Field Intensity; Field of n-Point Charges; Field due to Continuous Volume Charge Distribution; Field of Line Charge; Field of a Sheet Charge; Area Lines and Sketches of Fields.	14
Electric Flux Density, Gauss' Law	Electric Flux Density, Gauss' Law; Applications of Gauss' Law; Some Symmetrical Charge Distributions; Differential Volume Element; Divergence; Maxwell's First Equation (Electrostatic); The Vector Operator and The Divergence Theorem.	14
Energy And Potential	Energy Expanded in Moving a Point Charge in an Electric Field; The Line Integrals; Potential Difference and Potential of a Point Charge; The Potential Field of a System of Charges; Conservative Property; Potential Gradient; The Dipole Energy Density in The Electrostatic Field.	12
Conductors, Dielectric, and Capacitance	Current and Current Density; Continuity of Current in Metallic Conductors; Conductor's Properties and Boundary Conditions; The Method of Images; Semiconductors; The Nature of The Dielectric Materials; Capacitance; Capacitance of Some Useful Configurations; Capacitance of Two Wires Line.	14
Poisson's and Laplace's Equations	Poisson's and Laplace's Equations; Uniqueness Theorem; Solution of Laplace's Equations.	14
The Steady Magnetic Field	Biot-Savart Law; Ampere's Circuital Law; The Curl; Stokes' Theorem; Magnetic Flux Density; The Scalar and Vector Magnetic Potential; Derivation of Steady Magnetic Field Laws.	12
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**ENGINEERING ELECTROMAGNETIC**
	AUTHOR	**William H. Hayt**
	EDITION	**6th Edition**
	YEAR	**2001**
REFERENCE(S)	**-**	

CLASS	**SECOND**			***THEORY***	3	**Hrs./Week**
SUBJECT	**ELECTRONICS II**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 204	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Bipolar Junction Transistors	Transistor Construction and Operation; Common-Base, Common-Emitter, and Common-Collector Configurations; Transistor Rating.	10
DC Biasing Analysis and Design	Fixed-Bias Configuration; Emitter-Bias Configuration; Voltage-Divider Bias Configuration; Collector Feedback Bias Configuration; Common-Collector Configuration; Common-Base Biasing; Graphical D.C. Bias Configuration; D.C. Bias Circuit Design; Integrated Circuit Biasing; Bias Stabilization.	20
Thermal Stability and Stability Factors.		8
BJT as a Switch	Transistor Switching Times.	8
BJT A.C. Analysis	BJT Small Signal Modeling; The r_e Transistor Model; The Hybrid Equivalent Model; h-Parameters; Complete and Approximate Hybrid Model.	10
Cascaded Transistor Amplifiers		10
Field-Effect Transistors	Construction and Characteristics of JFET; JFET Parameters; Construction and Characteristics of MOSFET: Depletion and Enhancement MOSFETs; FET D.C. Biasing; FET Small Signal Analysis and Modeling.	14
Feedback Amplifiers	Voltage-Series Feedback; Voltage-Shunt Feedback; Current-Series Feedback; Current-Shunt Feedback.	20
Power Amplifiers	Class-A Power Amplifier; Class-B Power Amplifier; Class-AB Power Amplifier; Class-C Power Amplifier.	20
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**ELECTRONIC DEVICES AND CIRCUIT THEORY**
	AUTHOR	**Robert Boylestad and Louis Nashelsky**
	EDITION	**10th Edition**
	YEAR	**2008**
REFERENCE(S)	**INTEGRATED ELECTRONICS by JACOB MILLMAN**	

CLASS	**SECOND**			***THEORY***	2	**Hrs./Week**
SUBJECT	**COMMUNICATION THEORY I**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 205	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Classification of Signals	Power Signal: periodic, almost periodic, and random; Energy Signals: deterministic, random; Definition of Average Power and Energy in Time Domain.	8
Classification of Systems	Linear; Nonlinear; Time Variant; Time Invariant; Causal; Non-Causal; With Memory; Without Memory; Discrete; Continuous.	8
Fourier Series	Real Form Fourier Series (Trigonometric Form); Half-Period Expansion (Even and Odd); Properties of Fourier Series; Alternative Form of Fourier Series; Average Power in Terms of Fourier Series; Complex Form Fourier Series; Relation Between Real and Complex Form Fourier Series; Amplitude, Phase, and Power Spectral Density Spectrum (Characteristics); Parseval's Theorem; Applications in Linear Systems.	14
Fourier Transform	Definition of Fourier Transform and its Inverse; Properties of Fourier Transform: uniqueness, linearity, scaling, time delay, differentiation, time reversal, conjugate, modulation, convolution, multiplication, multiplication by t^n, duality; Amplitude, Phase, and Energy Spectral Density; Rayleigh Theorem; Sine and Cosine Fourier Transform; Applications in Linear Systems.	14
Correlation Techniques	Autocorrelation; Cross Correlation and Convolution; Applications.	10
Transmission Lines (T.L.)	Differential Equation for Distributed Parameter; Uniform Transmission Line and its Solutions; Characteristic Impedance; Propagation Constant; Variation of Characteristic Impedance and Propagation Constants (α and β) With Frequency; Special Transmission Lines: Lossless Transmission Line, Distortionless Transmission Line, Matched Transmission Line, Infinite Long Transmission Line; Inductive Loading; Phase and Group Velocity.	14

Transmission Line with Reflection	Determination of Integration Constants of Transmission Line in Terms of Receiving End; Impedance along The Line and Input Impedance; Input Impedance of Lossless Transmission Line; Input Impedance of Open Circuit ($Z_L=\infty$) and Short Circuit ($Z_L=0$) Lossless Transmission Line; Physical and Electrical Length of Transmission Line; Reflection Coefficients (Voltage and Current); Standing Wave Ratio; Sending and Receiving End Voltage, Current, and Power; Measurement of Transmission Line Characteristics; Equivalent Four Terminal Lump Parameters Network.	14
Impedance Matching and Smith Chart	Introduction to Main Circles in Smith Chart; Compensation Using Open Circuit and Short Circuit Stub (Series and Parallel Stub); Quarter Wavelength Transformer; Cascade λ/4 Transformers.	8
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**INTRODUCTION TO COMMUNICATION SYSTEMS**
	AUTHOR	**FERREL G. STREMLER**
	EDITION	**2ND EDITION**
	YEAR	**1982**
REFERENCE(S)	**TRANSMISSION LINES AND NETWORKS BY Walter C. Johnson**	

CLASS	**SECOND**			***THEORY***	1	**Hrs./Week**
SUBJECT	**ELECTRICAL CIRCUITS II**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 206	UNITS	2	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Resonance Circuits	Series Resonant Circuits; Quality Factor; Selectivity; Parallel Resonant Circuits; Equivalent Series and Parallel Combinations.	8
Transient Second Order Circuits	Series RL Circuits; Series RC Circuits; Series RLC Circuits; Source-Free Series and Parallel RLC Circuits.	8
Three-Phase Circuits	Balanced Three-Phase Voltages; Balanced Three-Phase Sources; Analysis of Y-Y Circuits; Analysis of Y-Δ Circuits; Analysis of Δ-Δ Circuits; Analysis of Δ-Y Circuits; Power Calculations.	8
Magnetically Coupled Circuits	Mutual Inductance; Coupling Circuits; Circuit Referred to Primary; Circuit Referred to Secondary; Reflected Impedance.	8
Passive Filters	Basic Filter Theory; Transmission and Attenuation Bounds; Classification of Filters; Constant-k Filters; m-Derived Filters; Composite Filters.	6
Active Filters	Introduction to OP-AMPs; First Order LP and HP Filters; BandPass and BandReject Filters; Higher Order Filters.	8
Two-Port Networks	Terminal Equivalent; Two-Port Parameters: Impedance Parameters, Admittance Parameters, Hybrid Parameters, and Transmission Parameters, Relationship between Parameters; Analysis of Terminated Two-Port Networks; Interconnected Two-Port Networks.	8
Network Synthesis	Properties of Impedance and Admittance Functions; S-Plane; Poles and Zeros; Synthesis Procedures by Foster.	6
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**FUNDAMENTALS OF ELECTRIC CIRCUITS**
	AUTHOR	**Charles K. Alexander and Matthew Sadiku**
	EDITION	**4TH EDITION**
	YEAR	**2009**
REFERENCE(S)	**NETWORK ANALYSIS AND SYNTHESIS BY GUPTA**	

CLASS	**SECOND**			***THEORY***	1	**Hrs./Week**
SUBJECT	**COMPUTER ARCHITECTURE**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 207	UNITS	4	***LABORATORY***	2	**Hrs./Week**

ARTICLE	**HOURS**
Basic Structure of a Computer.	2
Microcomputer Organization.	2
Computer Languages	2
Microprocessor Architecture and Its Operation	6
Memories.	2
Input / Output Devices	2
The Microcomputer Unit	6
Decoding and Executing an Instruction	6
Memory Interfacing	6
Interfacing I/O Devices	6
Execution of Memory-Related Data Transfer Instruction.	6
Instruction Classification.	4
Instruction Format and Word Size.	4
Writing Programs with Assembly Language.	6
TOTAL HOURS	60

TEXT BOOK(S)	**TITLE**	**COMPUTER ARCHITECTURE: A QUANTITATIVE APPROACH**
	AUTHOR	**John L. Hennessy and David A. Patterson**
	EDITION	**5TH EDITION**
	YEAR	**2011**
REFERENCE(S)	**MICROPROCESSORS AND INTERFACING: PROGRAMMING AND HARDWARE BY DOUGLAS V. HALL**	

CLASS	**SECOND**			***THEORY***	-	**Hrs./Week**
SUBJECT	**ELECTRONICS LABORATORY**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 208	UNITS	2	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
The Zener Diode	6
Bipolar Transistor Characteristics	6
Transistor as a Switch	6
Common Emitter Transistor Amplifier Design	12
Common Collector Amplifier Design	12
Common Base Amplifier and Cascade Amplifier	12
Field Effect Transistor Characteristics	9
FET Amplifier Design	9
Feedback Amplifiers	9
The Operational Amplifier	9
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	**-**
	AUTHOR	**-**
	EDITION	**-**
	YEAR	**-**
REFERENCE(S)	**-**	

CLASS	**SECOND**			***THEORY***	-	**Hrs./Week**
SUBJECT	**COMMUNICATIONS LABORATORY**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 209	UNITS	2	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
RC circuits as LPF and HPF	15
Resonance circuits	12
Frequency selective circuits (passive RC filters)	12
LC filters (constant-k and m-derived filters)	15
Butterworth and Chebyshev passive filters	12
Active filters	12
Transmission lines	12
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	–
	AUTHOR	–
	EDITION	–
	YEAR	–
REFERENCE(S)	–	

THIRD YEAR			1ST SEMESTER (HOURS/WEEK)			2ND SEMESTER (HOURS/WEEK)		
CODE	**SUBJECT**	**UNITS**	**THEO.**	**TUT.**	**LAB.**	**THEO.**	**TUT.**	**LAB.**
GS301	ENGLISH LANGUAGE III	2	1	-	-	1	-	-
GS302	SPORT EDUCATION	Sat.	-	-	-	-	-	-
ECE301	DIGITAL SYSTEM DESIGN	4	2	1	-	2	1	-
ECE302	ENGINEERING ANALYSIS	4	2	1	-	2	1	-
ECE303	PROBABILITY AND STATISTICS	2	1	1	-	1	1	-
ECE304	ANTENNAS AND PROPAGATION	4	2	1	-	2	1	-
ECE305	COMMUNICATION THEORY II	6	3	1	-	3	1	-
ECE306	ELECTRONICS III	6	3	1	-	3	1	-
ECE307	POWER ELECTRONICS	2	1	1	-	1	1	-
ECE308	CONTROL THEORY	4	2	1	-	2	1	-
ECE309	ELECTRONICS AND COMMUNICATIONS LAB.	3	-	-	3	-	-	3
ECE310	COMPUTER AIDED DESIGN	2	-	-	2	-	-	2
TOTAL UNITS		**39**	**17**	**8**	**5**	**17**	**8**	**5**
TOTAL HOURS PER WEEK			**30**			**30**		

CLASS	**THIRD**			***THEORY***	2	**Hrs./Week**
SUBJECT	**DIGITAL SYSTEM DESIGN**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 301	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE	**HOURS**
Digital Systems in General	4
Boolean Function Simplification	8
Design of Combinational Circuits Using NOR, NAND, Decoder, Multiplexer, ROM, or Programmable Devices (PLA, PAL, GAL).	10
Some Useful Combinational Circuits	10
Properties of XOR and it's Use In Parity Generator And Checker.	8
Synchronous Sequential Circuits (Analysis and Design).	10
Design with Algorithmic State Machine Charts.	10
Implementation of ASM Charts.	8
Asynchronous Sequential Circuits (Analysis and Design)	10
Debounce Circuit.	6
Properties of TTL and CMOS logic families.	8
Field programmable gate array (FPGA) technology	8
Hardware Description Languages (HDL)	8
Course work	12
TOTAL HOURS	120

TEXT BOOK(S)	**TITLE**	**DIGITAL DESIGN**
	AUTHOR	**M. MORRIS MANO**
	EDITION	**3RD EDITION**
	YEAR	**2002**
REFERENCE(S)	**-**	

CLASS	**THIRD**			***THEORY***	2	**Hrs./Week**
SUBJECT	**ENGINEERING ANALYSIS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 302	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Laplace Transform	From Fourier Series to Laplace Transform; Inverse Laplace Transform; Transform of Derivatives and Integral; Transform of Special Functions; Further General Theorems; Heaviside Expansion Theorem; Transform of Periodic Function; Convolution and Duhamel Function.	10
Second and Higher Order Differential Equations	Variation of Parameters; Modeling of Electric Circuits; Higher Order Linear Differential Equation With Constant Coefficients; System of Differential Equations.	10
Series Solution of Differential Equations and Special Functions	Power Series Method; Legendre Equation; Legendre Polynomials; Frobenius Method; Series Solution of Bessel Differential Equation; Modified Bessel Function; Equation Solvable in Term of Bessel Function; Applications of Bessel Function.	14
Linear Algebra	Matrix Addition; Scalar Multiplication; Matrix Multiplication; Linear System of Equations; Gauss Elimination; Rank of Matrix; Linear Dependence; Vector Space; Solution of Linear Systems; Existence; Uniqueness; Determinant; Cramer's Rule; Inverse of Matrix; Vector Space; Inner Product; Linear Transformation; Eigenvalues; Eigenvectors; Applications of Eigen Values; Orthogonal Matrix; Complex Matrix; Hermitian; Skew Hermitian; Unitary; Similarity of Matrices; Matrix Diagonalization and Orthogonalization.	16
Partial Differential Equations	Basic Concepts; Modeling; Vibrating; String; Wave Equation; Separation of Variables; D'Alembert's Solution of Wave Equation; Solution of Heat Equation; Rectangular and Circular Membrane.	16
Complex Analysis	Power and Root of Complex Numbers; Derivative; Analytic Function; Cauchy Riemann Equation; Laplace Equation; Special Function; Exponential, Trigonometric Function; Hyperbolic Function; Logarithm; General Power; Line Integral in Complex Plane; Cauchy Integral; Residue Integration Method.	12
Z-Transform	Definition; Relationship of Z-Transform to Laplace Transform; Properties of Z-Transform: linearity, delay, advance property for one-sided Z-Transform, time-reversal property; Multiplication by a^k ; Multiplication by K; Initial and Final Value Theorem; Finding the One Sided Z-Transform from the Laplace Transform; Inverse Z-Transform: Partial Fraction Expansion, Long Division, Complex Inversion Integral; Applications of Z-Transform.	12
TOTAL HOURS		90

TEXT BOOK(S)	TITLE	ADVANCED ENGINEERING MATHEMATICS
	AUTHOR	CLARENCE R. WYLIE
	EDITION	3RD EDITION
	YEAR	-
REFERENCE(S)	ADVANCED ENGINEERING MATHEMATICS BY KREYSZIG	

CLASS	**THIRD**			***THEORY***	1	**Hrs./Week**
SUBJECT	**PROBABILITY AND STATISTICS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 303	UNITS	2	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Probability	Sampling Space; Events; Operation with Events; Counting Sample Points; Probability of an Event; Some Probability Laws; Conditional Probability; Bayes' Theorem.	6
Random Variables	Concept of a Random Variable; Discrete Probability Distributions; Continuous Probability Distributions; Joint Probability Distributions; Mathematical Expectation; Law of Expectation; Special Mathematical Expectations; Properties of Variance; Chebyshev's Theorem.	8
Some Discrete Probability Distributions	Uniform Distribution; Binomial and Multinomial Distributions; Hypergeometric Distribution; Poisson Distribution; Negative Binomial and Geometric Distributions.	6
Some Continuous Probability Distributions	Normal Distribution; Normal Approximation to the Binomial; Gamma, Exponential and Chi-Square Distribution; Weibull Distribution.	8
Function of Random Variables	Transformation of Random Variables; Random Sampling; Sampling Theorem; Sampling Distribution of Means; Sampling Distribution of $(n-1)s^2/\sigma^2$; T-Distribution; F-Distribution.	8
Estimation Theory	Classical Methods of Estimation; Estimating of The Mean; Estimating The Difference Between Two Means; Estimating a Proportion; Estimating The Difference Between Two Proportions; Estimating The Variance; Estimating The Ratio of Two Variances; Bayesian Method of Estimation; Decision Theory.	8
Test of Hypotheses	Statistical Hypotheses; Type I and Type II Error; One-Tailed and Two-Tailed Tests; Test Concerning Means; Variances and Proportions; Goodness of Fit Test; Test for Independence.	8
Stochastic Process	Concept of Random Process; Classification of Random Processes; Nonstationary, Stationary, Wide Sense Stationary, And Ergodic Process; Definitions of Mean; Autocovariance; Autocorrelation; Cross Correlation and Cross Covariance of Nonstationary, Wide Sense Stationary, and Ergodic Processes; Wiener-Kinchin Theorem; Special Random Processes; White Process; Gaussian Random Process.	8
TOTAL HOURS		60

TEXT BOOK(S)	TITLE	PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS
	AUTHOR	RONALD E. WALOPLE
	EDITION	8TH EDITION
	YEAR	2006
REFERENCE(S)	-	

CLASS	**THIRD**			***THEORY***	2	**Hrs./Week**
SUBJECT	**ANTENNAS AND PROPAGATION**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 304	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Time-Varying Fields and Maxwell's Equations.		12
EM Wave Propagation	EM Wave Propagation in Lossless Dielectrics, Lossy Dielectrics, and Good Conductors.	12
Plane Wave, Poynting Vector, and Power Flow.		10
Reflection of Plane Wave at Normal Incidence.		10
Reflection of Plane Wave at Oblique Incidence.		8
Antennas	Antenna Basics; Hertzian Dipole; Half-Wave Dipole Antenna; Mono-Dipole Antenna; Small Loop Antenna; Antenna Arrays; Effective Area And Friis Equation; Radar Equation; Microwave Antennas.	20
Propagation in Ionosphere	HF; VHF; UHF; SHF.	8
Line of Sight Transmission	Equation of Line of Sight; Curvature of Earth; Tropospheric Propagation; Scatter Propagation.	10
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**ANTENNAS**
	AUTHOR	**JOHN D. KRAUS**
	EDITION	**2ND EDITION**
	YEAR	**1988**
REFERENCE(S)	**-**	

CLASS	**THIRD**			***THEORY***	3	**Hrs./Week**
SUBJECT	**COMMUNICATION THEORY II**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 305	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Introduction to Communication System		4
Modulation	Amplitude Modulation: Normal AM, Double Side Band (DSB), Single Side Band (SSB), Vestigial Side Band (VSB); Frequency Modulation: FM Generation (Direct and Indirect Method), FM Detection; Frequency Division Multiplexing (FDM).	30
Noise	Noise Figure; Noise in AM System; Noise in FM System.	20
Digital Communication System	The Sampling Theorem; Pulse Code Modulation (PCM); Differential Pulse Code Modulation (DPCM); Delta Modulation (DM); Time Division Multiplexing (TDM).	30
Probability of Error in Binary Signal	Probability of Error in Unipolar and Bipolar Transmission; Optimum Decision Level.	16
Digital Modulation Techniques	Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK); Phase Shift Keying (PSK), Performance of Various Digital Modulation Techniques.	20
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**DIGITAL AND ANALOG COMMUNICATION SYSTEMS**
	AUTHOR	**K. SAM SHANMUGAM**
	EDITION	**1ST EDITION**
	YEAR	**1979**
REFERENCE(S)	**INTRODUCTION TO COMMUNICATION SYSTEMS BY FERRELL G. STREMLER**	

CLASS	**THIRD**			***THEORY***	3	**Hrs./Week**
SUBJECT	**ELECTRONICS III**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 306	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Differential Amplifiers.		10
Operational Amplifier Applications	Inverting and Non-Inverting Operational Amplifiers; Instrumentation Amplifiers; Summing and Difference Amplifiers; Controlled Sources; Half-Wave and Full Wave Rectifiers; Clipping Circuits; Limiters; Logarithmic and Anti-Log Amplifiers.	20
Frequency Response	Transistors Model at High Frequencies; High Frequency Response; Low Frequency Response.	20
Oscillators	General Form of Oscillator ;Phase Shift Oscillator; Wien-Bridge Oscillator; Tuned-Circuit Oscillator; Crystal Oscillator; Hartley Oscillator; Colpitts Oscillator; Clapp Oscillator; Pierce Oscillator.	20
Multivibrators	Bistable Multivibrator; Monostable Multivibrator; Astable Multivibrator.	20
Digital Electronics	Logic Families; The Ideal Inverter; Noise Margin; Fan In; Fan Out; Power Dissipation; Propagation Delay; NMOS and CMOS Logic Gates; TTL NAND Gate; Combinational Digital Circuits; Read Only Memory (ROM); Programmable Logic Array (PLA); Random-Access Memory (ROM); Digital To Analog (D/A) And Analog To Digital (A/D) Converters.	20
Introduction to IC Fabrication		10
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**MICROELECTRONICS**
	AUTHOR	**JACOB MILLMAN AND ARVIN GRABEL**
	EDITION	**2ND EDITION**
	YEAR	**1987**
REFERENCE(S)	**MICROELECTRONIC CIRCUITS BU ADEL S. SEDRA AND KENNETH C. SMITH**	

CLASS	**THIRD**			***THEORY***	1	**Hrs./Week**
SUBJECT	**POWER ELECTRONICS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 307	UNITS	2	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Introduction	Types of electronics devices; Diode; Transistor; Thyristor Characteristics; Triac; Thyristor Gating Requirements; Methods of Switching ON and OFF; IGBT; Darlington; Power Field Effect Transistor; VMOS; Power Diodes; Fast recovery diode, Tunnel Diodes; Gunn Diodes.	8
Types of Firing Circuit		4
Converters (AC to DC)	Single Phase; Two Phase; Three Phase; Free-Wheeling Diode; Power Factor (PF) improvements of converters.	8
Overlap Angle	General Equation of Full Control Converter.	6
Inverters (dc to ac)	Force Commutated; Line Commutation Overlap Circuits; Single Phase Bridge; Three Phase Bridge.	8
Pulse Width Modulation		4
D.C. Chopper.		4
Cycloconverter.		4
Harmonics in Converter	Methods of Reducing Harmonics using Fourier Series analysis.	8
Applications of Thyristors		6
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**POWER ELECTRONICS HANDBOOK**
	AUTHOR	**MUHAMMAD H. RASHID**
	EDITION	**2ND EDITION**
	YEAR	**2010**
REFERENCE(S)	**-**	

CLASS	**THIRD**			***THEORY***	2	**Hrs./Week**
SUBJECT	**CONTROL THEORY**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 308	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE	**HOURS**
Introduction to Control Engineering.	4
Mathematical Representation of Components and Systems of Linear Automatic Control.	4
Block Diagram and Block Diagram Reduction	4
Multivariable System and Transfer Matrices	4
Revision of Laplace Transform and Inverse Laplace Transform.	4
Time Domain Analysis of System Response.	4
Time Domain Performance of Control System	6
Stability Analysis of Linear Automatic Control System.	4
Routh–Hurwitz stability Criterion and its Applications.	4
The Root-Locus Method.	4
Frequency Domain Analysis of Control System.	4
Bode Diagram.	4
Polar Plots.	4
Nyquist Stability Criterion.	4
Feedback Control Performance Based on Frequency Response.	4
Root Locus Approach to Control System Design	6
Cascade Compensation Using Frequency Response Plots	6
Nonlinear Control System.	4
Nonlinear Control System Analysis by Describing Function.	4
Discrete-Time Control System.	4
Z-Transform and Theory of Sampling Process.	4
Time Response of Sampled Data Control System.	4
Stability of Sampled Data Systems.	4
Analog and Digital Simulation.	4
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	**MODERN CONTROL ENGINEERING**
	AUTHOR	**KATSUHIKO OGATA**
	EDITION	**5TH EDITION**
	YEAR	**2010**
REFERENCE(S)	**-**	

CLASS	**THIRD**			***THEORY***	-	**Hrs./Week**
SUBJECT	**ELECTRONICS AND COMMUNICATIONS LABORATORY**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 309	UNITS	3	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
Active Filters	6
Non Linear Circuits using Operational Amplifiers	6
Feedback Amplifiers	9
Amplitude Modulation / Demodulation Using Integrated Circuits	12
Push Pull Class A and Class B Amplifiers	9
Differential Amplifiers	12
Multivibrator Circuits	6
Zero Crossing FM Detector	6
Sinusoidal Oscillator	6
Sampling Technique	9
Digital Modulation and Demodulation Circuits	9
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	**–**
	AUTHOR	**–**
	EDITION	**–**
	YEAR	**–**
REFERENCE(S)	**–**	

CLASS	**THIRD**			***THEORY***	-	**Hrs./Week**
SUBJECT	**COMPUTER AIDED DESIGN**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 310	UNITS	2	***LABORATORY***	2	**Hrs./Week**

ARTICLE	**HOURS**
Overview of the MatLab Environment	2
Variables and Arrays	2
Loops, Decision, and Flow Control	2
Graphics and Data Visualization	2
More on Matrices	4
Function M-File	4
Systems and Convolution	6
Numerical Analysis [Newton's and trapezoidal rule]	6
Sampling Theorem	6
Introduction to SimuLink	4
AM Modulation and Demodulation	6
Time Domain Analysis of Control Systems	4
Position and Speed Control Systems	4
Root Locus Design Graphical User Interface (GUI)	4
Frequency Response Analysis	4
TOTAL HOURS	60

TEXT BOOK(S)	**TITLE**	**MATLAB, AN INTRODUCTION WITH APPLICATIONS**
	AUTHOR	**AMOS GILAT**
	EDITION	**4TH EDITION**
	YEAR	**2011**
REFERENCE(S)	**-**	

FOURTH YEAR			1ST SEMESTER (HOURS/WEEK)			2ND SEMESTER (HOURS/WEEK)		
CODE	**SUBJECT**	**UNITS**	**THEO.**	**TUT.**	**LAB.**	**THEO.**	**TUT.**	**LAB.**
GS401	ENGLISH LANGUAGE IV	2	1	-	-	1	-	-
GS402	SPORT EDUCATION	Sat.	-	-	-	-	-	-
ECE401	ENGINEERING PROJECT	4	1	-	2	1	-	2
ECE402	MICROWAVES	4	2	-	-	2	-	-
ECE403	DIGITAL SIGNAL PROCESSING	4	2	1	-	2	1	-
ECE404	DIGITAL COMMUNICATIONS	6	3	1	-	3	1	-
ECE405	COMPUTER NETWORKS	4	2	-	-	2	-	-
ECE406	COMMUNICATION ELECTRONICS	4	2	1	-	2	1	-
ECE407	OPTICAL FIBER COMMUNICATIONS	4	2	1	-	2	1	-
ECE408	INFORMATION THEORY AND CODING	4	2	-	-	2		-
ECE409	EMBEDDED SYSTEMS	2	1	1	-	1	1	-
ECE410	ELECTRONICS AND COMMUNICATIONS LAB.	2	-	1	2	-	1	2
ECE411	MICROWAVES LAB.	1	-	1	2	-	-	-
ECE412	COMPUTER NETWORKS LAB.	1	-	-	-	-	-	2
TOTAL UNITS		**42**	**18**	**7**	**6**	**18**	**6**	**6**
TOTAL HOURS PER WEEK			**31**			**30**		

CLASS	**FOURTH**			***THEORY***	1	**Hrs./Week**
SUBJECT	**ENGINEERING PROJECT**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 401	UNITS	4	***LABORATORY***	2	**Hrs./Week**

ARTICLE	**HOURS**
Theoretical and experimental investigation of problems of applied nature in electronics and communication area. The group should submit a dissertation of the project, which is discussed before a staff committee.	90
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	**-**
	AUTHOR	**-**
	EDITION	**-**
	YEAR	**-**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**MICROWAVES**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 402	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Introduction to Microwaves	Typical Frequencies; Band Designation; Advantages of Microwaves; Applications of Microwaves.	2
Review of Electromagnetic Wave Theory	Maxwell's Equations; Wave Equations; Poynting Vector and Power Considerations; Uniform Plane Wave and Reflection; Boundary Conditions.	4
Review of Transmission Line Theory	The Lumped Element Circuit Model; Field Analysis of Transmission Line; The Terminated Lossless Transmission Line; The Smith Chart; The Quarter Wave Transformer; Generator and Load Mismatch; Lossy Transmission Line.	6
Impedance Matching and Tuning	Matching with Lumped Elements; Single Stub Tuning; Double Stub Tuning.	6
Waveguides	Rectangular Waveguides: TE Modes, TM Modes; Circular Waveguides: TE Modes, TM Modes; Surface Wave on a Grounded Dielectric Slab; Stripline; Microstrip.	10
Microwave Networks Analysis	Impedance and Admittance Matrices; The Scattering Matrix; The Transmission (ABCD) Matrix.	8
Microwave Resonators	Transmission Line Resonators; Rectangular Cavity Resonator; Circular Cavity Resonator; Quality Factor for a Resonator.	4
Waveguide Components	Microwave T-Junctions: H Plane T-Junction, E Plane T-Junction, E-H Plane T-Junction, Magic T-Junction, Rate Race T-Junction; Directional Couplers: Properties of Directional Couplers, Types of Directional Couplers, Applications of Directional Couplers; Waveguide Bends; Waveguide Tapers; Ferrite Isolators and Circulators.	8
Microwave Amplifiers	Two Port Power Gain Equations; Stability Considerations; Single Stage Microwave Amplifier Design.	8
Microwave Tubes	Klystron; Travelling Wave Tubes (TWT); Crossed-Field Tubes; Magnetron; Gyrotron.	4
TOTAL HOURS		60

TEXT BOOK(S)	TITLE	MICROWAVE ENGINEERING
	AUTHOR	DAVID M. POZAR
	EDITION	3RD EDITION
	YEAR	2008
REFERENCE(S)	-	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**DIGITAL SIGNAL PROCESSING**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 403	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Discrete Time Signals and Systems	Discrete Time Signals; Discrete Time Systems; Linearity; Shift Invariant System; Causality; The Unit Pulse Response Sequence; Convolution; Correlation; The Frequency Response Function; Sampling Theorem.	16
Fourier Analysis of Discrete Time System	Introduction to DTFT; Properties of DTFT; DFS; Properties of DFS; Circular Convolution.	14
Fast Fourier Transform (FFT)	Introduction to FFT; Radix-2 FFT; DIT-FFT; DIF-FFT; Some Applications of FFT.	10
Analogue Filter Approximation	Butterworth, Chebyshev, and Bessel Filters; Frequency Transformation in S-Domain.	10
Digital Filters	Introduction; IIR Design: Impulse Invariant, Step Invariant; Bilinear Transformation; Frequency Transformation in Z-Domain; FIR Filters: Introduction to Linear Phase, FIR Filter Design: Window Method; Frequency Sampling Method.	20
Realization of Digital Filters	Direct Form I; Direct Form II; Canonical Form; Parallel Realization; Cascaded Realization.	10
Applications of DSP	Channel Equalizer; Sparse Antenna Array Design.	10
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**DIGITAL SIGNAL PROCESSING**
	AUTHOR	**John G. Proakis AND Dimitris G Manolakis**
	EDITION	**4TH EDITION**
	YEAR	**2007**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	3	**Hrs./Week**
SUBJECT	**DIGITAL COMMUNICATIONS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 404	UNITS	6	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Digital Modulation	Differential Phase Shift Keying (DPSK); Quadrature Phase Shift Keying (QPSK); Offset QPSK (OQPSK); π/4 QPSK; Quadrature Amplitude Modulation (QAM); M-Ary Frequency Shift Keying (M-Ary FSK); Minimum Shift Keying (MSK); Gaussian Minimum Shift Keying (GMSK).	14
Synchronization	Phase Locked Loop (PLL) Recovery; Carrier Recovery: square law device, Costas loop, DF PLL; Clock Recovery: spectrum line method, minimum mean square error, early-late gate method.	14
Line Codes	Binary Line Codes; Multilevel Signaling.	12
Spread Spectrum Systems	Introduction; Advantages and Disadvantages; Pseudo Noise Sequence (PN Sequence) Generation and Properties; Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).	28
Satellite Communication	Introduction; Types Of Satellites; Frequency Bands; Satellite Construction; Satellite Link Design; Modulation and Multiplexing Techniques: FDM/FM, TDM; Multiple Access: FDMA, TDMA, CDMA.	28
Mobile Communication	Introduction; Cellular Structure; GSM Structure; Modulation in GSM; Air Interface of GSM; Introduction to GPRS; Introduction to 3G Mobile System.	24
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**DIGITAL COMMUNICATIONS**
	AUTHOR	**John G. Proakis**
	EDITION	**4TH EDITION**
	YEAR	**2000**
REFERENCE(S)	-	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**COMPUTER NETWORKS**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 405	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Introduction to Networks	Network Fundamentals: Network Devices, Network Topologies, Network Protocols, Local Area Networks (LAN), Wide Area Networks (WAN), Metropolitan Area Networks (MAN); Bandwidth: Measurement of Bandwidth, Limitation of Bandwidth, Throughput, Data Transfer Calculations; Network Models: OSI Model, TCP/IP Model.	20
Network Media	Copper Media: Cable Specifications, Coaxial Cable, STP Cable, UTP Cable; Optical Media: Multimode Fiber, Single Mode Fiber; Wireless Media; Signals and Noise.	12
LAN Physical Layer	Ethernet Media; Peer to Peer Network; Client to Server Network; Ethernet Frame Structure; SCMA/CD; Ethernet Technologies: 10Mbps, 100Mbps, 1Gbps, 10Gbps.	12
Network Layer	IPV4; Network Layer Protocols; Subnet.	8
Transport Layer	TCP/IP Protocol.	8
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**COMPUTER NETWORKS**
	AUTHOR	**Andrew Tanenbaum AND David Wetherall**
	EDITION	**5TH EDITION**
	YEAR	**2010**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**COMMUNICATION ELECTRONICS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 406	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Analogue Multiplier	Differential Amplifiers; Analogue Multiplier–1QM Circuit; Analogue Multiplier–2QM Circuit; Analogue Multiplier–4QM Circuit; Applications of The Difference Amplifier Circuits: AGC, modulator circuit, and phase detectors	24
Amplitude Modulation Techniques	Introduction to AM; Analogue Modulation Circuit; Non-Linear Device Modulation; Direct Tuned Circuit Modulation; Chopper Modulator; Practical Chopper Modulator; Cowan Modulator; FET Op-Amp Modulator; Balanced Chopper Modulator; Ring Modulator.	26
Amplitude Demodulation	Synchronous Detectors; Average Envelope Detector; Peak Envelope Detector; Practical PED	24
Angle Modulation Circuits	Introduction; Frequency Modulation; Phase Modulation; Equivalence Between FM and PM; Angle Modulator Circuit; Angle Modulation Detectors	26
Digital Communication Circuits	Introduction; Digital Communication Concept; Digital to Analog and Analog to Digital Converters	20
TOTAL HOURS		120

TEXT BOOK(S)	**TITLE**	**BASIC ELECTRONIC COMMUNICATION**
	AUTHOR	**ROY BLAKE**
	EDITION	**1ST EDITION**
	YEAR	**1993**
REFERENCE(S)	**PRINCIPLES OF ELECTRONIC COMMUNICATION SYSTEMS BY Louis Frenzel**	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**OPTICAL FIBER COMMUNICATIONS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 407	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
Basic Concepts	Parameters of Light Waves; Index of Refraction; Snell's Law; Polarization of Light and Electromagnetic Spectrum.	4
Optical Communication System	Block Diagram of an Optical Communication System; Advantages of Optical Communication System.	8
Optical Fiber	Optical Fiber Structure and its Parameters; Propagation of Light in Optical Fiber; Some Parameters of an Optical Fiber; Types of Optical Fiber; Advantage Types of Optical Fiber.	6
Signal Degradation in Optical Fiber	Attenuation; Attenuation Sources: absorption, bending, and mode coupling; calculations and methods of reduction.	6
Dispersion in Optical Fiber	Types of Dispersion: intermodal dispersion (material and waveguide), calculations and methods of reduction; Total Fiber Dispersion.	6
Optical Transmitters (Light Sources)	Light Emitter and its Performance Characteristics; Light Emitting Diode (LED): principles of operation, characteristics, coupling efficiency, optical and electrical beamwidth.	6
Optical Transmitters (Laser Diodes)	Principles of Operation; Characteristics; Laser Modes; External Quantum Efficiency; Dynamic Response; Frequency Chirp; Noise Sources.	6
Optical Receivers (Photodetectors)	Photodetector Operation; Characteristics; Photodetector Types: PN, PIN, APD, and phototransistor; Parameters and Comparisons; Response Time and Bandwidth; Noise Contribution and SNR Calculations in PIN Receivers; Noise Contributions and SNR Calculations in APD Receivers; Q-Value and Receiver Sensitivity; Sensitivity Improvement In APD; The Quantum Limit of Photodetection; Extinction Ratio; Power Penalty; Intensity Noise (RIN); Timing Jitter and Timing Jitter Penalty.	12
Fiber Optic System Design Considerations	Optical Power and Rise Time Budgets.	6

Laser Principles and Theory	Invention of The Laser; Review of Laser History; Laser Operation; Components of a Laser System; Brewster Angle; Population Inversion; Einstein Coefficients; Three and Four Level Laser Systems; Absorption and Amplification; Laser Threshold Condition; Resonator; Line Broadening Mechanism; Properties of Laser Light; Types of Lasers.	8
Analog Systems and Coherent Light	Homodyne and Heterodyne Systems; Noise Analysis in Coherent Heterodyne Receiver.	4
Optical Amplifiers	General Concepts and Limitations; Amplifier Examples; Semiconductor Optical Amplifier SOA; Fiber Amplifier; Erbium-Doped Fiber Amplifier; EDFA: EDFA Architecture, EDFA Power Conversion Efficiency and Gain, EDFA Quantum Conversion (QCE), EDFA Noise Analysis; Optical Noise Figure; N-Stage Cascaded Amplifiers; System Aspects; Cascaded Amplifiers Noise Figure; Multi-Channel Amplification In EDFAs; Optical Amplifier Applications.	10
Nonlinear Effects In Optical Fiber	Effective Length and Effective Area; Nonlinear Kerr Effect; Self-Phase Modulation SPM; Cross-Phase Modulation (XPM); Wave Mixing Wavelength Conversion.	6
WDM, And DWDM Systems		2
TOTAL HOURS		90

TEXT BOOK(S)	**TITLE**	**OPTICAL FIBER COMMUNICATIONS**
	AUTHOR	**Gerd Keiser**
	EDITION	**4TH EDITION**
	YEAR	**2010**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	2	**Hrs./Week**
SUBJECT	**INFORMATION THEORY AND CODING**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 408	UNITS	4	***LABORATORY***	-	**Hrs./Week**

ARTICLE		**HOURS**
A Review of Probability Theory.		4
Definitions and Measuring Of Information	General Model of Information Transmission System; Information Theory; Mathematical Model of Information Source; Discrete and Continuous Sources; Amount of Information; Information Axioms; Self Information; Source Entropy; Source Entropy Rate; Mathematical Description of Discrete Memoryless Communication Channel; Mutual Information; Transformation (Average Mutual Information); Marginal Entropies (Joint And Conditional Entropies).	12
Channel Capacity	Channel Capacity of Symmetric Discrete Channels; Efficiency of Channel and Redundancy; Channel Capacity of Non-Symmetric Discrete Channel; Cascading of Channels.	8
Source Coding	Some Definitions; Source Coding of Discrete Redundancy; Fixed Length Codes; Variable Length Codes: Huffman, Shannon-Fano codes; M-ary Huffman code.	10
Channel Coding	Aim of Channel Coding; Applications and Types of Channel Coding; Error Detecting Codes; Error Correcting Codes: Basic Concepts, Types of Error Correcting Codes; Linear Block Codes; Hamming Codes.	10
Cyclic Codes	Polynomial Algebra; Generator and Parity Check Polynomials; Systematic Cyclic Code; Generator And Parity Check Matrices of a Cyclic Code; Cyclic Encoder; Syndrome Decoders of Cyclic Codes.	8
Convolutional Codes	Basic Definitions; States and Trellis Diagrams; Transfer Function of Convolutional Code; Code Tree Representation of Convolutional Code; Viterbi Decoding Algorithm; Punctured Convolutional Codes; Applications of Convolutional Codes.	8
TOTAL HOURS		60

TEXT BOOK(S)	**TITLE**	**AN INTRODUCTION TO INFORMATION THEORY**
	AUTHOR	**John R. Pierce**
	EDITION	**2ND EDITION**
	YEAR	**1980**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	1	**Hrs./Week**
SUBJECT	**EMBEDDED SYSTEMS**			***TUTORIAL***	1	**Hrs./Week**
CODE	ECE 409	UNITS	2	***LABORATORY***	-	**Hrs./Week**

ARTICLE	**HOURS**
Definition and Performance Criteria of Embedded System.	5
Microprocessor-Based Systems in General	5
RISC and CISC Technologies	5
Microcontrollers Architectures and Families.	5
PIC Microcontroller Family	5
ADC/DAC Interfacing	5
Serial Communication	5
Linear Power Supply Circuit	5
Power Up and Reset Circuit	5
Clock Generation	5
Application Examples	5
Course Work	5
TOTAL HOURS	60

TEXT BOOK(S)	**TITLE**	**DESIGNING EMBEDDED SYSTEMS WITH PIC MICROCONTROLLERS**
	AUTHOR	**Tim Wilmshurst**
	EDITION	**2ND EDITION**
	YEAR	**2009**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	-	**Hrs./Week**
SUBJECT	**ELECTRONICS AND COMMUNICATIONS LAB.**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 410	UNITS	2	***LABORATORY***	3	**Hrs./Week**

ARTICLE	**HOURS**
Digital to Analog Converter	6
Analog to Digital Converter	6
Delta Modulation and Demodulation	6
Amplitude Shift Keying (ASK)	6
Phase Shift Keying (PSK)	6
Frequency Shift Keying (FSK)	6
M-ary Orthogonal FSK	6
Phase Detector	6
Voltage to Frequency Conversion	6
Phase Locked Loop	6
Digital Frequency Synthesizer	6
Time Division Multiplexing	6
Series Regulated Power Supply	6
Pulse Code Modulation (PCM)	6
Satellite Communication	6
TOTAL HOURS	90

TEXT BOOK(S)	**TITLE**	**MODERN DIGITAL AND ANALOG COMMUNICATION SYSTEMS**
	AUTHOR	**B.P. LATHI**
	EDITION	**3RD EDITION**
	YEAR	**1998**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	-	**Hrs./Week**
SUBJECT	**MICROWAVES LAB.**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 411	UNITS	1	***LABORATORY***	3*	**Hrs./Week**

*DURING THE 1ST SEMESTER ONLY.

ARTICLE	**HOURS**
Laboratory components description	9
Frequency, wavelength, and attenuation measurements	6
The directional coupler and its use	6
A study of the Doppler effect	6
Measurement of the permittivity using microwaves	6
Reflection from a single slot antenna	6
Antenna pattern measurements	6
TOTAL HOURS	45

TEXT BOOK(S)	**TITLE**	**-**
	AUTHOR	**-**
	EDITION	**-**
	YEAR	**-**
REFERENCE(S)	**-**	

CLASS	**FOURTH**			***THEORY***	-	**Hrs./Week**
SUBJECT	**COMPUTER NETWORKS LAB.**			***TUTORIAL***	-	**Hrs./Week**
CODE	ECE 412	UNITS	1	***LABORATORY***	2*	**Hrs./Week**

*DURING THE 2ND SEMESTER ONLY.

ARTICLE	**HOURS**
Networking cabling	2
TCP/IP settings	2
ARP and RAPR protocols	2
Router components	2
Router command line input and configurations	2
Router's show commands	2
Router basic configurations	4
Router interface configurations	2
Router Routing Protocol (RIP)	2
Router Routing Protocol (OSPF)	2
Switch command line input and configurations	2
Internetworking devices connections	2
Implementing VLAN	4
TOTAL HOURS	30

TEXT BOOK(S)	**TITLE**	**–**
	AUTHOR	**–**
	EDITION	**–**
	YEAR	**–**
REFERENCE(S)	**–**	