**ENT 200 ENTREPRENEURSHIP EDUCATION AND NEW VENTURE CREATION**

Introduction to Entrepreneurship:

Definition of Entrepreneurship

Difference between Entrepreneurship and Entrepreneurship

Entrepreneurship Theories

Types of Entrepreneur

Characteristics of the Entrepreneur

Functions of the Entrepreneur

The Entrepreneurial Process

Developing ideas and Business Opportunities

Analyzing the Market, Customers and Competition

Preparing the Feasibility Study and Business Plan

Sources of Financing

Setting up the Business Company:

Challenges you consider and study before starting any business

Factors that hinder business start-up

Business Failure:

Symptoms of business failure

Causes of business failure

How to prevent business failure

**ECE 321 Telecommunications I 2 Credits Sem. 1**

Elements of Communications System

Block diagram model, fundamental limitations

Amplitude modulation

Reasons for modulation of radio waves, Frequency spectrum of AM signals. Small signal and large signal modulations, Power in AM signals and percentage modulation, DSB, SSB, ISB and VSB Circuits for AM generation.

Angled Modulation:

A simple FM generation, FM analysis, Noise Suppression, Direct and indirect FM Generation, Phase-locked-loop (PLL) FM Transmitter, Wide band and narrow band FM signal.

Detection:

AM detectors, Envelope detection, Practical diode detection, Practical diode detector, VSB demodulator, Synchronous Detector, FM discriminations. Foster seeley discriminator, Radio, detector, Demodulation of FM waves: Detection in the presence of noise.

Radio-wave propagation :

Earth’s atmosphere, Spectrum and Nomenclature of radio waves, Polarization, Propagation modes, Factors affecting the propagation of radio waves, Propagation of radio waves at different frequencies: Critical frequency and maximum usable frequency, Line-of-sight propagation: Tropospheric scatter propagation.

Antennas:

Isotopic antenna, Radiation from a short dipole and power radiated by it. Radiation from a short grounded aerial, Effective height of an antenna, Antenna excitation. Half-wave and Quarter-wave antenna. Antenna arrays, linear array, end-fire and broadside arrays, Folded dipole, lop-periodic antennas, Baluns, Antenna types: Loop, slot, yagi-uda, parabolic, rhombic antennas, horn antennas: Patterns and patterns multiplication, Application of antennas at different frequency band, Some important antenna parameters, Bean width, power gain etc.

**FEG 303 Engineering Mathematics III 3 Credits**

Further Matrices

Direct graph and matrices. Application to engineering examples, Eigenvalues and eigenvectors. The characteristic equation. The Cauley – Hamilton theorem. The Kronecker product iterative solution of eigenvalues and vectors. Quadratic and hermitan forms. Triangles decomposition and its application. Matrix transformation, rotation of maxies, Diagonalisation, modal and special matrices.

Laplace Transforms

Transform of common functions. Properties of some functions. Shifting theorem. Inverse transforms. Solution of differential equations and simultaneous equations. Periodic and Heaviside unit step functions. Dirac delta impulse functions. Initial and final value theorems. Examples from electrical and Mechanical systems. Loaded beams.

Fourier Analysis

Definition and application. of Fourier series. Dirichlet conditions. Even and odd functions. Half and quarter wave symmetry. Application in civil, electrical and mechanical systems. Fourier transforms. Numerical harmonic analysis – twelve point analysis.

Double and triple integer, Line integral. Close curves. Parametric equation. Green’s theorem. Surface integral in two and three dimensions. Volume integral. Change of variables. Jacobian transformation..

Numerical analysis:

Numerical solution of equations – the Newton-Raphson iterative method. Numerical solution of differential equations. Euler method and the Runge-Kutta techniques. Curve fittings.

Special Function:

The gamma function – definition. Gamma function of negative values of x. The beta function. Relation between gamma and beta functions. The error function. The elliptic function of the first and second kind. Bessel function.

**ELE 311 Circuit Theory II 2 Credits**

Network Theorems and Network Topology

Network Theorems, Telegen’s Theorems. The Duality Principles Topology: General Steady State and Transient solutions. Network Transformations; State space Formulations of Networks. Magnetically Coupled Networks. Resonance in Networks.

Time Domain Analysis of Network.

Application of intero-differential equations to network, initial and final conditions. Forced responses and natural behaviour. Step and impulse Response.

**ECE 323 Electrical Devices and Circuits 2 Credits (Sem. 1) Prerequisite FEG 201**

The objective of this course is to teach the concept of models of electronic devices and application of these models in the analysis of non-linear circuits and also the limitation of these models.

Bipolar transistor: Review of transistor biasing, fixed and emitter biasing. Effects of coupling capacitors. Hybrid parameter model. . Limitation of models.

Single Stage Amplifier: Common emitter common base and common collector amplifiers. Impedance transformation current and voltage gains, input and output impedances.

Multiple Amplifiers: Common emitter common cascade, CE CB and CE CE configuration. Darlington and Long tail pair configurations. Field effect transistor. Constructional features, biasing techniques. JFET and MOSFET. Voltage gains, common sources and common drain amplifiers. Multiple FET amplifiers.

High Frequency Amplifiers: Hybrid pi-node of bipolar and FET devices. Effect of base Emitter and collector capacitances.

Power Amplifiers: Analysis of class A, B and C amplifiers. Distortion analysis, transformer coupling. Heat sink analysis.

Voltage Regulation and Stabilizer: Zener diode stabilizer, Transistor stabilizer circuits. Series and feedback stabilizer.

Feedback Amplifiers: Negative feedback amplifiers, series and parallel feedback.

**ECE 333 Digital System Design 2 Credits (Sem. 1)**

Introduction: Digital and Analog Quantities, Binary Digits. Logic levels and digital wave form. Introduction to basic logic operations. Digital integrated circuit.

Number systems, Operations and codes: Decimal and Binary arithmetic,, 1’s and 2’s compliments of binary numbers, Hexadecimals and octal numbers, Binary coded decimal (BCD) and digital codes.

Logic Gates: The inverters, AND gate, OR gate, NAND and NOR gates. Exclusive-OR and Exclusive-NOR gates, example of IC gates.

Boolean Algebra and Logic Simplification: Boolean operations and expressions, Laws and rules of Boolean Algebra, Demorgan’s theorems, Simplification using Boolean Algebra Standard Forms of Boolean Algebra, the Kamaugh map.

Combinational Logic: Basic combination logic circuits implementing combinational logic functions of combinational logic.

Clocks and Training Circuits: Crystal and LC oscillator circuits. Astable and monostable time using IC chips (NE 555, 74121 and 74123). Programmable timers and Programmable timer/counters. CMOS timer ICs. Power – Up one shot circuits.

**ELE 341 Electromagnetic Field and Waves 3 Credits (Sem. 1)**

Energy and Potentials: Definition of potential difference, potential gradient. The potential field of a system of charges. The diploe. Energy density in the electrostatic field energy and its flow.

Conductors and Dielectrics: Current and current density, continuity of currents. Conductors properties and boundary conditions. Dielectric material capacitance and examples.

Time Varying Field and Maxwell’s Equations: Maxwell’s Equation in integral form. Practical application of Maxwell’s Equation. Simple solutions of field equation and their application in circuit theory.

The steady Magnetic Field: Ampere’s circuit law, the scalar and vector magnetic potential derivation of steady magnetic laws. Magnetization and magnetic boundary conditions.

Varying Electromagnetic Field: Varying magnetic field in thin plates. Electromagnetic field in conductors, Study of skin effect.

Propagation and Reflection of Electromagnetic waves: Plane dielectrics. Polluting Vectors and power consideration. Reflection of uniform plane waves. Standing wave.

**ECE 331 Signals and Systems 2 Credits (Sem. 1)**

Models of physical systems. Applications of linear differential equations for differential equations to the analysis of linear systems with electrical network as examples.

Superposition and Convolution: Discrete and continuous time system impulse response, Numerical method in convolution. State variable description of discrete an continuous time system solution of state variable equations. The concepts of observability and control ability.

Functions of Matrices: Importance and application of state matrix.

Nature of Spectrum of a Signal: Fourier series representation of periodic and non-periodic signals. Parsevals theorem, Sampling of time signal and transmission of signal through linear filters – properties of Fourier transforms.

Probability Density Functions: Gaussian Releign and Bivariate distributions. Error-probability and decision making. Power spectral density.

Analysis of Cascaded Systems: Application of Laplace and inverse transforms, Stability in the S-domain, Laplace transform analysis of casual periodic inputs to linear systems Z. Transform: The Z transform and its inverse. Properties of the Z transform. Application of the Z transform including the Direct Z transform method of filter design.

**ELE 343 Electromechanical Devices and Machines I 2 Credits (Sem. I)**

Magnetic Circuits: Magnetic and Electric Field Energy and Forces, Magnetic field, Magnetic circuits, Magnetic field energy, Electromechanical conversion principles. Alignment force and torque: Simple excitation, force torque, double excitation forms of rotary machine, other interaction force, prototype two pole cylindrical machine multipolar, Elementary linear machines.

Basic elements of electrical machines: Basic concepts of flux linkage and linkage change. Transformers, General features and principles of operation, transformer classification, equivalent circuits and phasor diagrams. Determination of transformer parameters. Performance calculations, voltage regulation, efficient parallel operation, load sharing. Auto transformer, potential and current transformers, vector groupings and connection harmonics. Tap-changing transformers, three phase transformer rating.

**ELE 353 Power Systems 3 Credits (Sem. I)**

Introduction to conventional and renewable energy resources for power generation. Principles of power generations: hydro and thermal plants. Gas turbine plant, magnetohydrodynamic (MHD) generation, economic consideration in the choice of plant types.

Power supply planning: System planning, generating station location and plant size, high, medium and low voltage power networks, busbar systems, substation sitting, load, voltage factor control, load diversity and utilization factor, maximum demand.

System economics: Economic loading of machines, tariffs, overhead lines, long, medium and short line calculations. Power charts, transmission line efficiency and voltage regulation. P.U. rating, power cables.

Transformers: Operating characteristics, loading, losses, efficiency and regulation, winding convection, equivalent circuits, three phase transformers, tap changing.

Distributed System: Distributing system planning, choice of distribution voltage, radial characteristics, sub-transmission and distribution substation.