PEOPLE'S UNIVERSITY, BHOPAL

Programme: **B. Tech. (Electronics and Communication Engineering)** Semester: **V**

Subject Title	Subject Code	Credit			Theory		
		L	T	P	External (70)	Internal (30)	Total (100)
Entrepreneurship & IPR	**BT- 501**	3	1	-			Min: 40 (D Grade)

Duration of theory (External): 3 hours
Theory internal - max marks: 30
Best of two mid semester test – Max. Marks: 20
Assignment / Quiz/ Regularity – Max. Marks: 10

Unit	Contents (Theory)
I	**Entrepreneurship**: Definition and functions of an entrepreneur, qualities of a good entrepreneur; role of entrepreneur in economic development; theories of entrepreneur, socio, economic, cultural and psychological; entrepreneur traits and behavior, roles in economic growth, employment, social stability, export promotion and indigenization, creating a venture, opportunity analysis competitive and technical factors, sources of fund. Forms of business organizations/ownership - formation of a company - procedures and formalities for setting up of new industry-sources of information to contact for what and where.
II	**Management:** Importance, definition and functions; dimensions of organizations, size/specialization, behavior formalization, authority centralization, departmentalization, spam and line of control, technology and minzberg organization typology, line, staff & matrix organization. **Motivation Theories** - Maslow, Mc Cullen - motivation model - need, want, motive and behavior – attitude towards work - self assessment and goal setting - achievement, motivation and behavior measurement, swot analysis and ta analysis - stress and conflict management; with uncertainty; creativity and innovation.
II	**Marketing:** Importance, definition, core concepts of need want and demand, project identification and formulation: sources of information - opportunity guidance - choice of technology and its evaluation; consumer behavior; market survey and research; preliminary project report, detailed project report, assessing viability and feasibility of a report. Exchange &relationships, product value, cost and satisfaction (goods and services) marketing environment; selling, marketing and societal marketing concepts; four p's, product, price, placement, promotion. **Finance:** Nature and scope, forms of business ownerships, balance sheet, profit and loss account, fund flow and cash flow statements, breakeven point (bep) and financial ratio analysis, pay-back period, npv and capital budgeting. Subsidies and concessions for ssi - role of state and central government agencies in promotion of small scale industry
IV	**Concept of Property:** Theories of property, types of intellectual property- origin and development, theories of intellectual property rights, need for protecting intellectual property, commercialization of intellectual property rights by licensing, determining financial value of intellectual property rights, negotiating payments terms in intellectual property transaction
V	**Introduction to Patent Law**, (a) Paris convention , (b) Patent cooperation treaty, (c) Wto- trips , indian patent law, the patents act, 1970, patentable subject matter, patentability criteria, procedure for filing patent applications, patent granting procedure, revocation, patent infringement and remedies, relevant provisions of the biological diversity act, 2002, access and benefit sharing issues

References:

1. Handbook for New Entrepreneurs, EDII, Ahmadabad.
2. Entrepreneurial Development by P.Saravanavel.
3. Environment and Entrepreneur – Tandon B.C. (Asian Publishers, New Delhi)
4. Emerging Trends in Entrepreneurship Development Theories & Practices – Singh P.Narendra Entrepreneurship &
5. Growth of Enterprise in Industrial Estates – Rao Gangadhara N

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Subject Title	Subject Code	Credits			Theory		
		L	T	P	External (70)	Internal (30)	Total (100)
Electromagnetic Theory	BT- 522	3	1	-			Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours
Theory Internal - Max Marks: 30

Best of Two Mid Semester Test –Max Marks: 20
Quiz/Assignment / Attendance – Max. Marks: 10

Unit	Contents (Theory)
I	Review of vector calculus, orthogonal coordinate systems, gradient, divergence and curl. Laplacian operator for scalar and vectors. Vector integral and differential identities and theorems. Phasor representation of harmonic variation of scalar and vectors Static electric fields, Columb's law, electric flux density and electric field intensity, permittivity, dielectric constant, field of distributed charges in free space, potential function, Laplace's and Poisson's equations, electric dipole, stored electric energy density. Boundary conditions at abrupt discontinuities between two media including conducting boundaries, surface charge distribution capacitance between two isolated conductors.
II	Solution of Laplace's equations in systems of dielectric and conducting boundaries, uniqueness theorem, two dimensional boundary condition problems, solution by symmetry, conformal transformation of functions, image theory etc. fields in parallel wire, parallel plane and coaxial systems. Static currents and magnetic fields- flow of charge in conductive media, lossy conductive medium, current density, specific conductivity, mobility, explanation of Ohm's law employing mobility. Magnetic effects of current flow, Biot-Savart's law in vector form magnetic field intensity, magnetic flux, and permeability, closed loop currents, Ampere's circuital law in integral and differential vector form, magnetic vector potential and related equations. Problems related to straight wire toroidal and cylindrical solenoids, inductance. Boundary conditions on magnetic field, equivalent surface currents for abrupt discontinuity of magnetic field.
III	Time varying fields – Faraday's law in integral and differential forms, displacement current concept, Maxwell's equations in differential and integral forms, wave equations in source free region electric and magnetic stored energy density, continuity equation, Poynting vector theorem. Time harmonic fields, r.m.s. phasor representation of field vectors, Maxwell's equations for TH field, average energy density, complex Poynting vector, duality concept. Helmholtz wave equation, general solution in free space in various coordinates, plane polarized wave in free space, properties of plane waves, wave front, power flow, stored energy density.
IV	Circular and elliptic polarization, resolution in terms of linear polarized waves and vice- versa. Plane waves in lossy medium, low loss dielectric, good conducting and ionized media, complex permittivity, loss tangent, skin depth, transmission line analogy, boundary conditions at perfect conductor surface, surface current density Interference of two plane waves traveling at oblique directions.
V	Reflection and refraction of plane waves at dielectric media and conducting Surfaces, Brewster's angle, total internal reflection, resultant fields and power flow in both media. Frequency dispersive propagation, phase velocity and group velocity. Magnetic vector potential for sources in free space, retarded potential, radiation principles, boundary condition at infinity

References:

1. Hyat, W.H. and Buck, J.A. "Engineering Electromagnetics" Tata McGraw Hill Publishing Co. Ltd.
2. Mathew N.O Sadiku; Elements of Electromagnetic; Oxford.
3. P.V. Gupta; Electromagnetic Fields; Dhanpat Rai.
4. N.N. Rao; Element of Engineering Electromagnetic; PHI.
5. S.P. Seth; Electromagnetic Field ;Dhanpat Rai & Sons.

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Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Digital Communication	ECT- 503	3	1	2	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

Best of Two Mid Semester Test –Max Marks: 20

Quiz/Assignment / Attendance – Max. Marks: 10

Practical Internal - Max Marks: 15

Lab Performance, Lab Record & Viva –Max Marks: 10

Assignment / Quiz – Max. Marks: 05

Unit	Contents (Theory)
I	**Random variables:-** Cumulative distribution function, Probability density function, Mean, Variance and standard deviations of random variable, Gaussian distribution, Error function, Correlation and autocorrelation, Power Spectral density of digital data.
II	**Pulse Modulation** **Analog Signals:-** Sampling of Signal, Sampling Theorem for Low Pass and Band Pass Signals, Aliasing, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Channel Bandwidth for PAM-TDM Signal, Types of Sampling, Instantaneous, Natural and Flat Top (Mathematical and Spectral Analysis), Aperture Effect, Introduction to Pulse Position and Pulse Duration Modulation.
III	**Pulse Code Modulation** **Digital Signal:** Quantization, Quantization Error, Pulse Code Modulation (PCM), Signal-to-Noise Ratio in PCM, Companding, Data Rate and Bandwidth of Multiplexed PCM Signal, Inter-symbol Interference, Differential PCM (DPCM), Delta Modulation (DM), and Adaptive Delta Modulation (ADM), Comparison of various system in terms of Bandwidth and Signal-to-Noise Ratio.
IV	**Digital Modulation Techniques:** Analysis, Generation and Detection (Block Diagram), Spectrum and Bandwidth of Amplitude Shift Keying (ASK), Binary Phase Shift Keying (BPSK), Differential Phase Shift Keying (DPSK), Quadrature Phase Shift Keying (QPSK), Binary Frequency Shift Keying (BFSK), Minimum Shift Keying, Quadrature Amplitude Modulation (QAM), Comparison of digital modulation techniques on the basis of probability of error, Matched Filter.
V	**Information Theory And Coding:** Information theory and coding- Information, entropies (Marginal and conditional), Mutual information, Types of channel, channel capacity, Shannon theorem, Shannon-Hartley theorem (S/N-BW trade off), Entropy coding: Shannon Fano and Huffman coding methods, Error control coding: Hamming code, Linear Block Code, Cyclic code and convolution codes.

References:

1. Taub and Schilling: Principles of Communication System, TMH
2. Simon Haykins: Communication Systems, 4th Edition, John Wiley.
3. Singh and Sapre: Communication System, TMH
4. B.P. Lathi: Modern Analog and Digital Communication System, Oxford University Press
5. Tomasi: Advanced Electronics Communication Systems, 6th Edition, PHI

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List of Experiments

1. To study of sampling theorem.
2. To study of Time division Multiplexing.
3. To study of pulse code modulation.
4. To study of Delta modulation.
5. To study of FSK Modulation and demodulation.
6. To study of PSK modulation and demodulation.
7. To Study of DPSK modulation and demodulation.
8. To Study of QPSK modulation and demodulation.
9. To Study of the comparative study of delta modulation and adaptive delta modulation technique.
10. To study of process of Quantization using MATLAB.

Procedure for performing the Experiments

All experiments (wherever applicable) should be performed through the following steps.

Step 1: Circuit should be designed/ drafted on paper.

Step 2: The designed/drafted circuit should be simulated using Simulation S/W (TINA-V7/ PSPICE/ Lab view/ CIRCUIT MAKER).

Step 3: The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.

Step 4: The bread board circuit should be fabricated on PCB prepared on PCB machine.

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Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Microprocessor	**ECT-504**	3	1	2	**(70)**	**(30)**	Min: 40 (D Grade)	**(35)**	**(15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

Best of Two Mid Semester Test –Max Marks: 20

Quiz/Assignment / Attendance – Max. Marks: 10

Practical Internal - Max Marks: 15

Lab Performance, Lab Record & Viva –Max Marks: 10

Assignment / Quiz – Max. Marks: 05

Unit	Contents (Theory)
I	**Introduction to Digital Computer and Microprocessor:** **Digital Computers:** General architecture and brief description of elements, instruction execution, instruction format, and instruction set, addressing modes, programming system, higher lever languages. **Buses and CPU Timings:** Bus size and signals, machine cycle timing diagram, instruction timing, processor timing. **Microprocessor and Microprocessor Development Systems:** Evolution of Microprocessor, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture advancements of microprocessors, typical microprocessor development system.
II	**8085 microprocessor:** pin configuration, internal architecture. Timing & Signals: control and status, interrupt: ALU, machine cycles, Instruction Set of 8085: **Addressing Modes:** Register addressing, direct addressing; register indirect addressing, immediate addressing, and implicit addressing. Instruction format, op-codes, mnemonics, no. of bytes, RTL, variants, no. of machine cycles and T states, addressing modes. **Instruction Classification:** Data transfer, arithmetic operations, logical operations, branching operation, machine control; Writing assembly Language programs, Assembler directives.
III	**16-bit Microprocessors:** Architecture: Architecture of INTEL 8086 (Bus Interface Unit, Execution unit), register organization, memory addressing, memory segmentation, Operating Modes Instruction Set of 8086 Addressing Modes**:** Instruction format: Discussion on instruction Set: Groups: data transfer, arithmetic, logic string, branch control transfer, processor control. **Interrupts:** Hardware and software interrupts, responses and types.
IV	**Fundamental of Programming:** development of algorithms, flowcharts in terms of structures, (series, parallel, if-then-else etc.) **Assembler Level Programming:** memory space allocation (mother board and user program) Assembler level programs (ASMs) **Other Microprocessors:** Motorola 6800/MC6809, 65C02, Signetics 2650 etc.
V	**Peripheral Interfacing:** I/O programming: Programmed I/O, Interrupt Driven I/O, DMA I/O interface: serial and parallel communication, memory I/O mapped I/Os. Peripheral Devices: 8237 DMA controller, 8255- Programmable peripheral interface, 8253/8254 Programmable timer/counter 8259 programmable Interrupt Controller.

References:

1. A Ditya P Mathur, "Introduction to Microprocessor" Tata Mc Graw Hill
2. M. Rafiquzzaman, "Microprocessors- Theory and applications" PHI
3. B. Ram, "Advanced Microprocessor & Interfacing" Tata McGraw Hill
4. Renu Singh & B.P. Singh, "Microprocessor and Interfacing and applications" New Age International
5. Hall D.V., "Microprocessors Interfacing" Tata Mc Graw Hill
6. Liu and Gibson G.A., "Microcomputer Systems: The 8086/8088 Family" Prentice Hall (India)

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Programme: **B. Tech. (Electronics and Communication Engineering)** Semester: **V**

List of Experiments

1. To store 8 bit data in register in 8085 microprocessor.
2. Add two 8 bit numbers in 8085 microprocessor.
3. To study program to clear accumulator then 3 to the accumulator ten times.
4. Program to load the accumulator with the value 55H and compliment accumulator 70 times.
5. To perform addition of two binary numbers of 8 bit length.
6. To find a largest number in a given string.
7. To perform short a string of bytes in a descending order
8. To perform the ASCII multiplication.
9. To Study the binary to gray conversion.
10. To find 2's compliment of the given number.

Procedure for performing the Experiments

All experiments (wherever applicable) should be performed on Microprocessor 8085/8086 Trainer Board.

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Programme: **B. Tech. (Electronics and Communication Engineering)** Semester: **V**

Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Communication Network & Transmission Line	ECT- 505	3	1	2	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

Best of Two Mid Semester Test –Max Marks: 20

Quiz/Assignment / Attendance – Max. Marks: 10

Practical Internal - Max Marks: 15

Lab Performance, Lab Record & Viva –Max Marks: 10

Assignment / Quiz – Max. Marks: 05

Unit	Contents (Theory)
I	Characteristic Parameters of symmetrical and asymmetrical two port networks and their design: image impedance, iterative impedance, characteristic impedance, propagation coefficient, image transfer coefficient ,iterative transfer coefficient, Lattice and Bridged-T networks, reactive matching networks, matching techniques, Insertion Loss, symmetrical and asymmetrical attenuators and their design.
II	Passive LC Filters: Analysis and design of Low pass, high pass, band pass and band elimination filters, m-derived filters, composite filters, Filter specifications, Butterworth approximation, Chebyshev approximation, elliptic function approximation, frequency transformation.
III	Positive real function, LC, RL, RC, and RLC network synthesis, Foster and Cauer network, minimum positive real function, Brune's method, Bott-Duffin method, Synthesis-Coefficient.
IV	Transmission line fundamentals: Lumped parameter equivalent, voltage and current on a transmission line, infinite line, characteristic impedance and propagation constant, waveform distortion, attenuation and phase equalizers, distortion-less line, loading, liner reflection on a line, reflection coefficient, input and transfer impedances, open circuit and short circuit line, reflection factors, reflection loss, insertion loss, T and π equivalents of a line, location of line fault. Construction and design of two wire line and coaxial cable.
V	Line at radio frequencies, parameters of line and coaxial cable at radio frequencies, dissipation-less line, voltage and current on a dissipation-less line, standing waves, standing wave ratio, input impedance of open circuit and short circuit, power and impedance measurement on lines, eighth-wave, quarter-wave and half wave line, circle diagram, Smith chart, solution of problems sing Smith chart, single and double stub matching .introduction to micro-strip lines and its analysis.

References:

1. J.D. Ryder: Networks and Transmission Lines, 2nd edition, PHI
2. M.E. Valkenberg: Introduction to Modern Network synthesis, Wiley Eastern Ltd.
3. G.K. Mithal: Network Analysis, Khanna Publishers.
4. Umesh Sinha: Networks and Transmission Lines, Satya Prakashan
5. Suresh: Electric Circuits and Networks, Pearson Education.

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List of Experiments

1. To study the basics of transmission line.
2. To measuring the primary constants of transmission line.
3. To measuring the input impedance of the transmission line.
4. To measuring the attenuation of transmission line.
5. To measuring the phase displacement between the current and voltage at input of the lines.
6. To measure the frequency characteristics of Line.
7. To perform the signal phase shift along the line.
8. To study the fault localization within line.
9. To Study the m-derived filter.
10. To Study the k-derived filter.

Procedure for performing the Experiments

Following illustrative practical should be simulated with the help of any RF simulation software e.g. FEKO / HFSS / IE3D / Microwave Office / Microwave Studio or any other similar software, OR Transmission Line Trainer Kit.

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Programme: **B. Tech. (Electronics and Communication Engineering)** Semester: **V**

Subject Title	Subject Code	Credits			Practical		
		L	T	P	External (35)	Internal (15)	Total (50)
Dot Net	**BT- 526**	0	0	4			Min: 20 (D Grade)

Practical Internal - Max Marks: 15

Lab Performance, Lab Record & Viva –Max Marks: 10

Assignment / Quiz – Max. Marks: 05

Unit	Contents *(Practical)*
I	**Introduction:** Introduction to DOT NET Framework, its Architecture, Components, Languages, Application Development, Requirements and Features, Installation of DOT NET, IIS Server, Introduction to C#, Comparison of C, C++, Java and C#.
II	**C# Console:** Introduction to C# Program Structure, Tokens, Expressions, Data Types, Conditional Statements, Loops, Switch Case, Functions, Strings, Arrays, File Handling, Exception Handling, C# as Object Oriented Language, Classes & Objects, Constructors, Inheritance, Polymorphism, C# Packages and Namespaces.
III	**Windows Applications:** Introduction to HTML, HTML Tags, Introduction to CSS, Types, Introduction to Windows Applications, Use of C# Tools in Development of Windows Applications, Validation Controls, MDI Forms and Introduction to Crystal Reports.
IV	**Web Applications:** Introduction to ASP.NET, Introduction to Web Page Designing, Web Development, Static Pages, Dynamic Pages, Introduction to SQL, SQL Queries, SQL Server, Introduction to ADO.NET, Development of Applications with Data Base, Front End – Back End Connectivity, Types, Data Base Controls, Introduction to Content Management System and FCK Editor.
V	**Additional Technologies:** Introduction to XML, Structure and Syntax of XML, Introduction to Java Scripts, Using Java Scripts on Web Forms, Introduction to AJAX, Application of AJAX in Web Design Applications and Development of a Small Project in ASP.NET using C#.

References:

1. C# Programming by E.Balagurusamy, Tata Mc Graw Hill Publications
2. C# Complete Reference, Tata McGraw Hill Publications
3. DOT NET for BEginners by Wrox Publications.
4. DOT NET 4.0 by Harvey Dietal & Paul Dietal.
5. DOT NET Technology by Daminni Grover, IK Publications.

List of Experiments

1. Program in C# to implement Conditional Statements, Looping Statements and Switch Case
2. Program in C# to implement Arrays, Functions and its Types
3. Program in C# to implement Exception Handling and File Handling
4. Program in C# to implement Classes and Inheritance
5. Program in C# to implement Polymorphism
6. Creating a Simple Window Application
7. Creating Static Web Pages using ASP.NET
8. Creating Dynamic Web Pages using ADO.NET
9. Study of XML and Java Script
10. Development of a Small Data Base Web Application

Procedure for performing the Experiments

All experiments (wherever applicable) should be performed using DOTNET Software.

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Programme: **B. Tech. (Electronics and Communication Engineering)** Semester: **V**

Subject Title	Subject Code	Credits			Practical		
		L	T	P	External	Internal	Total (50)
Software Lab –III	ECT- 507	0	0	2	(Nil)	(50)	Min: 20 (D Grade)

Practical Internal - Max Marks: 50

Lab Performance, Lab Record & Viva –Max Marks: 25
Assignment / Quiz – Max. Marks: 25

Contents (Practical)
Electronic Design Automation Software: Introduction to EDA environment, eg. Microwind / Cadence / Sylvaco / Tanner silicon HiPer / Xilinx ISE 9i / any similar software / Any Freeware - EDA, its study and simulation/analysis/design of circuits. (The EDA tool package should have equal number of perpetual licenses for all modules and should have GUI)
Verilog: Introduction, Language Element, Expression, Gate Level Modeling, User-Defined Primitives, Data Flow Modeling, Behavioral Modeling, Structural Modeling, Synthesize, Verilog Constructs To G ate, Modeling- Combinational Logic, Modeling-Sequential Logic, Modeling A Memory.
Formatting & Partitioning: Introduction to Hard Disks, Formatting of Hard Disks, Partitioning of Hard Disks, Introduction to Software, Installation of System Software, Installation of Operating System and Application Software.

References:

1. J. Bhasker: A Verilog HDL Primer, New Edition, Pearson Education.
2. J. Bhasker: A Verilog HDL Synthesis, BS Publication.
3. D. L. Perry: VHDL: Programming by Example, TMH.
4. V. A. Pedroni: Circuit Design with VHDL, PHI.
5. J. R. Armstrong and F. G. Gray: VHDL Design Representation and Synthesis, Pearson Education
6. Palnitkar: VHDL, Pearson Education
7. Software Manuals.

List of Experiments

1. Write VHDL code for AND, OR NOT gates.
2. Write VHDL codes for NAND, NOR, XOR.
3. Write VHDL Program for 2:4 decoder.
4. Write VHDL Program for 8:3 encoder.
5. Write VHDL program for 8×1 MUX.
6. Write VHDL program for binary to gray code convertor
7. Write VHDL program for DEMUX.
8. Write VHDL program for the comparator.
9. Write VHDL program for half adder.
10. Write VHDL program for full adder.

Procedure for performing the Experiments

All experiments (wherever applicable) should be performed using XILINX/Model Sim Softwares.

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Subject Title	Subject Code	Credits			Practical		
		L	T	P	External	Internal (50)	Total (50)
Industrial Training- I	**ECT-508**	-	-	2	**(Nil)**		Min: 20 (D Grade)

Practical Internal - Max Marks: 50

Assignment / Quiz – Max. Marks: 50

Duration: 2 weeks after the IV semester in the summer break. Assessment in V semester.

For the assessment of industrial training undertaken by the students, following components are considered with respective weightage.

Marks of various components in industry should be awarded to the student, in consultation with the Training and Placement Officer (TPO)/ Faculty of the institute, who must establish contact with the supervisor/ authorities of the organization where, students have taken training, to award the marks for term work. During training, students will prepare a first draft of the training report in consultation with the section incharge. After training they will prepare final draft with the help of the TPO/ faculty of the institute. Then, they will present a seminar on their training and will face viva-voce on training in the institute.