THREE YEAR POLYTECHNIC DIPLOMA
(Electronics and Communication Engineering)
Second Year, 3rd SEMESTER
Batch 2014 onwards

(Session 2016-2017)

SCHEME OF PAPERS

CODE	TITLE OF PAPER	LOAD			
		L	**T**	**P**	**CR.**
DECE-201	Digital Electronics	3	1	0	3.5
DECE-202	Electronic Instruments and Measurement	3	1	0	3.5
DECE-203	Principles of Communication Engineering	3	1	0	3.5
DECE-204	Electronic Devices and Circuits	3	1	0	3.5
DECE-205	Electrical Machines	3	1	0	3.5
DECE-251	Digital Electronics Lab*	0	0	2	1.0
DECE-253	Principles of Communication Engineering Lab*	0	0	2	1.0
DECE-254	Electronic Devices and Circuits Lab*	0	0	2	1.0
DECE-255	Electrical Machines Lab*	0	0	2	1.0
DMCE-301	Basics of Management	3	1	0	3.5
**	Environment Studies	2	0	0	-
	Total	20	6	8	25

Total contact hours: 34 hours

* DECE 251, DECE 253, DECE 254, DECE 255 are practical papers only. There will not be any theory examination for these papers.

* * Subject is compulsory and qualifying only; having no credit, final examination will be internal.

DECE- 201 DIGITAL ELECTRONICS

L T P   CR
3 1 0   3.5

SECTION –A

Introduction: Distinction between analog and digital signal,Applications and advantages of digital signals.

Number System: Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa. Binary addition, subtraction, multiplication and division including binary points. 1's and 2's complement method of addition/subtraction, sign magnitude method of representation, floating point representation

Codes and Parity: Concept of code, weighted and non-weighted codes, examples of 8421, BCD, excess-3 and Gray code, Concept of parity, single and double parity and error detection, Alpha numeric codes: ASCII and EBCDIC.

Logic Gates and Families: Concept of negative and positive logic, Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.

Logic Simplification: Postulates of Boolean algebra, De Morgan's Theorems,Various identities. Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates,Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits.

SECTION –B

Arithmetic circuits: Half adder and Full adder circuit, design and implementation,Half and Full subtracter circuit, design and implementation,4 bit adder/subtracter. Adder and Subtractor IC (7484).

Decoders, Multiplexeres and Demultiplexeres: Four bit decoder circuits for 7 segment display and decoder/driver ICs,Multiplexers and De-Multiplexers, Basic functions and block diagram of MUX and DEMUX, Different types and ICs.

Latches and flip flops: Concept and types of latch with their working and applications, Operation using waveforms and truth tables of RS, T, D, Master/Slave JK flip flops, Difference between a latch and a flip flop, Flip flop IC.

Counters: Introduction to Asynchronous and Synchronous counters, Binary counters, Divide by N ripple counters, Decade counter, Pre-settable and programmable counters, Up/down counter, Ring counter with timing diagram

Shift Register: Introduction and basic concepts including shift left and shift right,Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out, Universal shift register,Buffer register, Tristate Buffer register.

RECOMMENDED BOOKS
1. Digital Electronics by V K Sangar , Raj Publishers, Jalandhar
2. Digital Electronics by KS Jamwal, Dhanpat Rai and Co., New Delhi
3. Digital Electronics by Rajiv Sapra, Ishan Publication, Ambala
4. Digital Electronics by BR Gupta, Dhanpat Rai & Co., New Delhi

DECE-202 ELECTRONIC INSTRUMENTS AND MEASUREMENT

L T P   CR
3 1 0 3.5

SECTION -A

Basic of Measurement: Measurement, method of measurement, types of instruments, Specifications of instruments, Accuracy, precision, sensitivity, resolution, range, errors in measurement, sources of errors, limiting errors, loading effect, importance and applications of standards and calibration.

Voltage ,Current and Resistance Measurement: Principles of measurement of dc voltage, dc current, ac voltage, ac current, Principles of operation and construction of permanent magnet moving coil (PMMC) instruments ,Moving iron type instruments, measurement of d.c voltage and current, measurement of ac voltage and current, milli-volt measurement, Block diagram of multimeter and measurement of voltage, current and resistance using multimeter ,Specifications of multimeter and their applications,Limitations with regard to frequency and input impedance

SECTION –B

Cathode Ray Oscilloscope: Construction and working of Cathode Ray Tube(CRT),Time base operation and need for blanking during flyback, synchronization, Block diagram description of a basic CRO and triggered sweep oscilloscope, front panel controls, Specifications of CRO and their explanation Measurement of current, voltage, frequency, time period and phase using CRO,CRO probes, special features of dual beam, dual trace, delay sweep.

Signal Generator and Analytical: Explanation of block diagram specifications of low frequency and RF generaters, pulse generators, function generator.

Impedance Brides and Q Meter: Wheat stone bridge,AC bridges: Maxwell's induction bridge, Hay's bridge, De-Sauty's bridge, Schering bridge and Anderson bridge, Block diagram description type RLC bridge, specifications of RLC bridge, diagram and working principle of Q meter

Digital Instruments: Comparison of analog and digital instruments, working principle of ramp,dual slope and integration type digital voltmeter, block diagram and working of a digital multimeter.

RECOMMENDED BOOKS

1. Electronics Measurement and Instrumentation by AK Sawhney, Dhanpat Rai and Sons, /New Delhi

2. Electronics Measurement and Instrumentation by Oliver, Tata McGraw Hill Education Pvt Ltd, New Delhi

DECE-203 PRINCIPLES OF COMMUNICATION ENGINEERING

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3 1 0 3.5

SECTION –A

Introduction: Need for modulation, frequency translation and demodulation in communication systems, Basic scheme of a modern communication system.

Amplitude modulation: Derivation of expression for an amplitude modulated wave. Carrier and side band components, Modulation index, Spectrum and BW of AM Wave. Relative power distribution in carrier and side bands, Elementary idea of DSB-SC, SSB-SC, ISB and VSB modulations, their comparison, and areas of applications

Frequency Modulation: Expression for frequency modulated wave and its frequency spectrum (without Proofand analysis of Bassel function) Modulation index, maximum frequency deviation and deviation ratio, BW and FM signals, Carson's rule, Effect of noise on FM carrier. Noise triangle, Role of limiter,Need for pre-emphasis and de-emphasis, capture effect, Comparison of FM and AM in communication systems.

Phase Modulation: Derivation of expression for phase modulated wave, modulation index, comparison with Frequency modulation.

SECTION -B

Principles of Modulators: Working principle and typical applications of: square law modulator,switching modulator, collector modulator, base modulator, balanced modulator, ring modulator.

Principles of FM Modulators: Working principles and applications of reactance modulator, vector diode modulator, VCO and Armstrong phase modulator. Stabilization of carrier for using AFC Block diagram approach.

Demodulation of AM Waves: Principles of demodulation of AM wave using diode detector circuit; concept of Clipping and formula for RC time constant for minimum distortion (no derivation) Principle of demodulation of AM Wave using synchronous detection.

Demodulation of FM Waves: Basic principles of FM detection using slope detector ,Principle of working of thefollowing FM demodulators,Foster-Seeley discriminator ,Ratio detector,Quadrature detector,Phase locked Loop (PLL) FM demodulators

RECOMMENDED BOOKS

1. Electronics Communication System by Kennedy, Tata McGraw Hill Education Pvt Ltd, New Delhi

2. Fundamentals of Communication System by Fitz, Tata McGraw Hill Education Pvt Ltd, New Delhi

3. Principles of Communication Engineering by Taub, Tata McGraw Hill Education Pvt Ltd,

4. Electronics Communication by KS Jamwal, Dhanpat Rai and Co, New Delhi

5. Radio Engineering by GK Mittal, Khanna Publishers, New Delhi

DECE-204 ELECTRONIC DEVICES AND CIRCUITS

L T P   CR
3 1 0   3.5

SECTION-A

Multistage Amplifiers: Need for multistage amplifier, Gain of multistage amplifier, Different types of multistage amplifier like RC coupled, transformer coupled, direct coupled, and their frequency response and bandwidth.

Large Signal Amplifier: Difference between voltage and power amplifiers, Importance of impedance matching in amplifiers, Class A, Class B, Class AB, and Class C amplifiers, collector efficiency and Distortion in class A,B,C, Single ended power amplifiers, Graphical method of calculation (without derivation) of output power; heat dissipation curve and importance of heat sinks. Push-pull amplifier, and complementary symmetry push-pull amplifier.

Feedback in Amplifiers: Basic principles and types of feedback, Derivation of expression for gain of an amplifier employing feedback, Effect of feedback (negative) on gain, stability, distortion and bandwidth of an amplifier, RC coupled amplifier with emitter bypass capacitor, Emitter follower amplifier and its application.

Sinusoidal Oscillators: Use of positive feedback, Barkhausen criterion for oscillations, Different oscillator circuits-tuned collector, Hartley, Colpitts, phase shift, Wien's bridge, and crystal oscillator. Their working principles (no mathematical derivation but only simple numerical problems)

SECTION-B

Tuned Voltage Amplifier: Series and parallel resonant circuits and bandwidth of resonant circuits, single and double tuned voltage amplifiers and their frequency response characterstics.

Wave Shaping Circuits: General idea about different wave shapers, RC and RL integrating and differentiating circuits with their applications, Diode clipping and clamping circuits and simple numerical problems on these circuits

Multivibrator Circuits: Working principle of transistor as switch, Concept of multi-vibrator: astable, monostable, and bistable and their applications, Block diagram of IC555 and its working and applications ,IC555 as monostable and astable multi-vibrator.

Opto Electric Devices: Working principles and characteristics of photo resistors, photo diodes, photo transistors, opto couplers.

RECOMMENDED BOOKS
1. Electronic Principles by Sahdev, Dhanpat Rai and Sons, New Delhi.
2. Electronics Principles by Malvino, Tata McGraw Hills, New Delhi
3. Electronic Devices and Circuits by Millman and Halkias, McGraw Hills, New Delhi
4. Electronics Devices and Circuits by Bhupinderjit Kaur, modern Publishers, Jalandhar
5. Basic Electronics by Grob, Tata McGraw Hills, New Delhi
6. Art of Electronics by Horowitz

DECE-205 ELECTRICAL MACHINES

L T P   CR
3   1 0   3.5

SECTION-A

Three Phase Supply: Advantage of three-phase system over single-phase system, Star Delta connections Relation between phase and line voltage and current in a three phase system, Power and power factor in three-phase system and their measurements by one, two and three wattmeter methods.

Transformers: Principle of operation and constructional details of single phase and three-phase transformer, core type and shell type transformers, difference between single phase and three phase transformers and their applications, Voltage Regulation of a transformer (No Derivation),Losses in a transformer, Efficiency, condition for maximum efficiency and all day efficiency, Auto transformers and instrument transformer, CTs and PTs (Current transformer and potential transformer),CVT (Constant Voltage Transformer)

Introduction to Rotating Electrical Machines: E.M.F induced in a coil rotating in a magnetic field, Definition of motor and generator, Basic principle of a generator and a motor, Torque due to alignment of two magnetic fields and the concept of Torque angle, Basic Electromagnetic laws (Faraday's laws of Electromagnetic Induction).

SECTION-B

DC Machines: Principle of working of d.c motors and d.c generator, their constructional details, Function of the commutator for motoring and generating action, Factors determining the speed of a DC motor, Different types of excitation, Characteristics of different types of DC machines Starting of DC motors and starters, Application of DC machines

A.C. Motors: Revolving magnetic field produced by poly phase supply, Brief introduction about three phase induction motors, its principle of operation, Types of induction motors and constructional features of squirrel cage and slip-ring motors, Starting and speed control Star Delta and DOL (Direct-on-line) starters, Reversal of direction of rotation of 3-phase induction motors, Applications of induction motors, Principle and working of Synchronous Machines, Application of Synchronous Machines

RECOMMENDED BOOKS
1. Electrical Machine by SK Bhattacharya, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Electrical Machines by Nagrath and Kothari, Tata McGraw Hill Education Pvt Ltd, New Delhi
3. Experiments in Basic Electrical Engineering: by S.K. Bhattacharya, KM Rastogi: New Age International (P) Ltd. Publishers, New Delhi
4. Electrical Machines by SK Sahdev, Uneek Publications, Jalandhar
5. Electrical Engineering by JB Gupta, SK Kataria & Sons, New Delhi
6. Electrical Machines by DR Arora, Ishan Publications, Ambala city
7. Electrical Technology Vol. - I and II B.L. Thareja, S Chand and Co. New Delhi

DECE-251 DIGITAL ELECTRONICS LAB

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List of Practicals

1. Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR(EXNOR) gates

2. Realisation of logic functions with the help of NAND or NOR gates - Design of a NOR gate latch and verification of its operation

3. To design a half adder using XOR and NAND gates and verification of its operation Construction of a full adder circuit using XOR and NAND gates and verify its operation

4. 4 bit adder, 2's complement subtractor circuit using an 4 bit adder IC and an XOR IC and verify the operation of the circuit.

5. To design a NOR Gate Latch and verification of its operation

6. Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch , D flip-flop, JK flip-flops).

7. Verification of truth table for encoder and decoder ICs, Mux and DeMux

DECE-253 PRINCIPLES OF COMMUNICATION ENGINEERING LAB

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0 0 2   1.0

List Of Practicals

1.   a) To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation

         b) To measure the modulation index of the wave obtained in above practical

2.   a) To obtain an AM wave from a square law modulator circuit and observe waveforms

         b) To measure the modulation index of the obtained wave form.

3.   To obtain an FM wave and measure the frequency deviation for different modulating signals.

4.   To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion.

5.   To obtain modulating signal from a FM detector .

6.   To observe the sampled signal and compare it with the analog input signal. Note the effect of varying the sampling pulse width and frequency on the sampled output.

7.   To observe and note the pulse amplitude modulated signal (PAM) and compare them with the corresponding analog input signal

DECE-254 ELECTRONIC DEVICES AND CIRCUITS LAB

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1. Plot the frequency response of two stage RC coupled amplifier and calculate the bandwidth and compare it with single stage amplifier

2. To measure the gain of push-pull amplifier at 1KHz

3. To measure the voltage gain of emitter follower circuit and plot its frequency response

4. Plot the frequency response curve of Hartley and Colpitts Oscillator

5. Plot the frequency response curve of phase shift and Wein bridge Oscillator

6. To observe the output waveforms of series and shunt clipping circuits

7. To observe the output for clamping circuits

8. Use of IC 555 as monostable multivibrator and observe the output for different values of RC

DECE-255 ELECTRICAL MACHINES LAB

L T P   CR
0 0 2 1.0

List of Practicals

1. Demonstrate various instruments use viz Ammeter, Voltmeter, Wattmeter, p.f meter etc for their identification and connecting procedure in a circuit.

2. To measure power and power factors in 3 Phase load by two wattmeter method

3. To determine the efficiency of a single phase transformer from the data obtained through open circuit and short circuit test

4. To connect the primary and secondary windings of a three phase transformer in a suitable circuit and to verify line and phase current and voltage relationship respectively

5. To connect a dc shunt motor with supply through a 3 point starter and to run the motor at different speeds with the help of a field regulator

6. To run a 3 phase squirrel cage induction motor with the help of a star-delta starter. To change the direction of rotation of the motor.

7. To measure power and power factor of a single phase induction motor.

DMCE-301 BASICS OF MANAGEMENT

L T P   CR
3 1 0   3.5

SECTION-A

Principles of Management: Introduction, definition and importance of management, Functions of Management: Planning, Organizing, Staffing, Coordinating, Directing, Motivating and Controlling.
Concept and Structure of an organization Types of industrial organization: Line organization, Functional organization, Line and Functional organization Hierarchical Management Structure Top, middle and lower level management Departmentalization Introduction and its advantages.
Work Culture: Introduction and importance of Healthy Work Culture in organization, Components of Culture, Importance of attitude, values and behaviour Behavioural Science – Individual and group behaviour, Professional ethics – Concept and need of Professional Ethics
Leadership and Motivation:
Leadership: Definition and Need of Leadership, Qualities of a good leader, Manager vs. leader
Motivation: Definition and characteristics of motivation, Factors affecting motivation, Maslow's Need Hierarchy Theory of Motivation, Job Satisfaction

SECTION-B

Legal Aspects of Business: Introduction and need
Labour Welfare Schemes: Wage payment : Definition and types, Incentives: Definition, need and types
Factory Act 1948, Minimum Wages Act 1948
Management Scope in different Areas:
Human Resource Development: Introduction and objective, Manpower Planning, recruitment and selection, Performance appraisal methods
Material and Store Management: Introduction, functions and objectives of material management
Purchasing: definition and procedure, Just in time (JIT)
Marketing and Sales: Introduction, importance and its functions, Difference between marketing and selling, Advertisement- print media and electronic media, Market-Survey and Sales promotion.

RECOMMENDED BOOKS
1. Principles of Management by Philip Kotler TEE Publication
2. Principles and Practice of Management by Shyamal Bannerjee: Oxford and IBM Publishing Co, New Delhi.
3. Financial Management by MY Khan and PK Jain, Tata McGraw Hill Publishing Co., 7, West Patel Nagar , New Delhi.
4. Modern Management Techniques by SL Goel: Deep and Deep Publications Pvt Limited , Rajouri Garden, New Delhi.

ENVIRONMENTAL STUDIES

L T P
2 0 0

SECTION-A

Ecology: Basics of ecology, eco system and sustainable development, Conservation of land reforms, preservation of species, prevention of advancement of deserts and lowering of water table

Sources of pollution: natural and man-made, their effects on living and non-living organisms

Pollution of water: causes, effects of domestic wastes and industrial effluent on living and non-living organisms

SECTION-B

Pollution of air: causes and effects of man, animal, vegetation and non-living organisms, Sources of noise pollution and its effects, Current issues in environmental pollution and its control, Global warming, Green house gases, non-conventional sources of energy, introduction to clean technology

Introduction to Green buildings: site selection, material efficiency, energy efficiency, water efficiency, building form.

Non-conventional sources: Role of non-conventional sources of energy in environmental Protection

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SCHEME OF PAPERS

CODE	TITLE OF PAPER	LOAD			
		L	T	P	CR.
DECE-206	Network Filters and Transmission Lines	3	1	0	3.5
DECE-207	Communication system-1	3	1	0	3.5
DECE-208	Power Electronics	3	1	0	3.5
DECE-209	Consumer Electronics	3	1	0	3.5
DECE-210	Optical Fiber Communication	3	1	0	3.5
DECE-256	Network Filters and Transmission Lines lab*	0	0	2	1.0
DECE-257	Communication system-1 Lab*	0	0	2	1.0
DECE-259	Consumer Electronics Lab*	0	0	2	1.0
DECE-260	Optical Fiber Communication Lab*	0	0	2	1.0
DHSS-201	Generic Skills and Entrepreneurships**	3	0	0	3.0
***	Punjabi	2	0	0	-
	Total	20	5	8	24.5

Total contact hours: 33 hours

* DECE-256, DECE- 257, DECE-259, DECE 260 are practical papers only. There will not be any theory examination for these papers.

**Common with other diploma programmes.

*** Subject is compulsory and qualifying only; having no credit, final examination will be internal.

DECE-206 NETWORK FILTERS AND TRANSMISSION LINES

L T P   CR
3 1 0   3.5

SECTION-A

Networks: Symmetrical and asymmetrical networks, Balanced and unbalanced network, T-network, Л network, Ladder network; Lattice network, L-network and Bridge T-network, Symmetrical Network, Concept and significance of the terms characteristic impedance, propagation constant, attenuation constant, phase shift constant and insertion loss. T-network and Л Network, Asymmetrical Network Concept and significance of iterative impedance, image impedance, image transfer constant and insertion loss. The half section (L-section) symmetrical T and Л sections into half sections

Attenuators: Units of attenuation (Decibels and Nepers), General characteristics of attenuators, Analysis and design of simple attenuator of following types, Symmetrical T and Л type, L type.

SECTION-B

Filters: Brief idea of the use of filter networks in different communication systems, concept of low pass, high pass, band pass and band stop filters. Basic ideas of Butterworth, Chebychev filters Impedance characteristics vs frequency characteristics of a low and high pass filter and their significance, Attenuation Vs frequency, Phase shift Vs frequency, characteristics impedance vs frequency of T and Л filters and their significance, Simple design problems of prototype low pass section, M-Derived Filter, Limitation of prototype filters, need of m-derived filters, Crystal and its equivalent circuits, special properties of piezoelectric filters and their use, Basic concept of active filters and their comparison with passive filters.

Transmission Lines: Transmission Lines, their types and applications, Distributed constants, T and Л representation of transmission line section, Definition of characteristic impedance, propagation constant, attenuation constant and phase shift constant, Concept of infinite line, Transmission line equation, expression for voltage, current and impedance at a point on the line, Concept of transmission lines at high frequencies, Introduction to stubs. (Single, open and short stubs).

RECOMMENDED BOOKS

1. Network Lines and Fields by John D Ryder; Prentice Hall of India, New Delhi.
2. Network Filters and Transmission Lines by AK Chakarvorty, Dhanpat Rai and Co. Publication, New Delhi.
3. Network Analysis by Van Valkenburg, Prentice Hall of India, New Delhi.
4. Network Analysis by Soni and Gupta, Dhanpat Rai and Co. Publication, New Delhi.
5. Network Theory and Filter Design by Vasudev K. Aatre.
6. Network Filters and Transmission line by Umesh Sinha.
7. Electrical and Electronics Measuring instrumentation , A.K Sawhney, Dhanpat Rai and Co. Publication, New Delhi.

DECE-207 COMMUNICATION SYSTEMS-1

L T P   CR
3 1 0   3.5

SECTION –A

AM/FM Transmitters: Classification of transmitters on the basis of modulation, service, frequency and power, Block diagram of AM transmitters and working of each stage, Block diagram and working, principles of reactance FET and Armstrong FM transmitters

AM/FM Radio Receivers: Principle and working with block diagram of super heterodyne AM receiver. Function of each block and typical waveforms at input and output of each block, Performance characteristics of a radio receiver: sensitivity, selectivity, fidelity, S/N ratio, image rejection ratio and their measurement procedure. ISI standards on radio receivers (brief Idea) , Selection criteria for intermediate frequency (IF). Concepts of simple and delayed AGC, Block diagram of an FM receiver, function of each block and waveforms at input and output of different blocks. Need for limiting and de-emphasis in FM reception, Block diagram of communication receivers, differences with respect to broadcast receivers.

Antennas: Electromagnetic spectrum and its various ranges: VLF, LF, MF, HF, VHF, UHF, Microwave, Physical concept of radiation of electromagnetic energy from a dipole, Concept of polarization of EM waves, Definitions and physical concept of the terms used with antenna like a point source, gain, directivity, aperture, effective area, radiation pattern, beam width, and radiation resistance, loss resistance, Types of antenna brief description, characteristics and typical applications of half wave dipole, medium wave antenna, folded dipole, turns tiles, loop antenna, yagi and ferrite rod antenna (used in transistor receivers), brief description of broad-side and end fire arrays, their radiation pattern and applications (without analysis), brief idea about rhombic antenna and dish antenna.

SECTION-B

Propagation: Basic idea about different modes of wave propagation and typical areas of application, Ground wave propagation and its characteristics, summer field equation for field strength, Space wave communication-line of sight propagation, standard atmosphere, concept of effective earth radius range of space wave propagation standard atmosphere, Duct propagation: sky wave propagation-ionosphere and its layers. Explanation of terms- virtual height, critical frequency and skip distance, maximum usable frequency, multiple hop propagation.

Fiber Optic Communications: Advantages of Fiber Optic Communication, Block Principle of Light Penetration and Propagation, NA, Types of optical fibers and cables, Brief idea of Losses in Optical fibers and Dispersion, Working principles and characteristics of optical light sources and light detectors, Block diagram of fiber optic communication link, Basic idea of fiber connection techniques- splicing and lensing.

RECOMMENDED BOOKS

1. Communication Systems by George Kennedy, Tata McGraw Hill Education Pvt Ltd, New Delhi.
2. Communication Systems by A.K. Gautam, SK Kataria and Sons, New Delhi.
3. Fundamentals of Communication System by Fitz, Tata McGraw Hill Education Pvt Ltd, New Delhi.

DECE-208 POWER ELECTRONICS

L T P   CR
3 1 0 3.5

SECTION-A

Introduction to Thyristors and other Power Electronics Devices: Construction, Working principles of SCR, two transistor analogy of SCR, V-I characteristics of SCR, SCR specifications & ratings, Different methods of SCR triggering, Different commutation circuits for SCR, Series & parallel operation of SCR, Construction & working principle of DIAC, TRIAC & their V-I characteristics, Construction, working principle of UJT, V-I characteristics of UJT. UJT as relaxation oscillator, Brief introduction to Gate Turn off thyristor (GTO), Programmable uni-junction transistor (PUT), MOSFET, Basic idea about the selection of Heat sink for thyristors, Application such as light intensity control, speed control of universal motors, fan regulator, battery charger.

Controlled Rectifiiers: Single phase half wave controlled rectifier with load (R, R-L), Single phase half controlled full wave rectifier (R, R-L), Fully controlled full bridge rectifier, Single phase full center tap rectifier.

SECTION-B

Inverters, Choppers, Dual Converters and Cyclo converters: Principle of operation of basic inverter circuits, concepts of duty cycle, series & parallel. Inverters & their applications, Choppers: Introduction, types of choppers (Class A, Class B, Class C and Class D), Step up and step down choppers, Dual convertors and cyclo convertors: Introduction, types & basic working principal of dual convertors and cyclo convertors & their applications.

Thyristorised Control of Electric drives: DC drive control: Half wave drives, Full wave drives, Chopper drives (Speed control of DC motor using choppers),AC drive control: Phase control, Constant V/F operation, Cycloconvertor drives.

RECOMMENDED BOOKS

1. Power Electronics by P.C. Sen, Tata Mc Graw Hill Education Pvt Ltd. New Delhi.
2. Power Electronics by P.S. Bhimbhra, Khanna Publishers, New Delhi.
3. Power Electronics – Pricilpes and Applications by Vithayathi, Tata Mc Graw Hill Education Pvt Ltd. New Delhi.
4. Power Electronics by M.S. Berde, Khanna Publishers, New Delhi.
5. Power Electronics by MH Rashid.
6. Industrial Electronics and Control by SK Bhattacharya and S. Chatterji, New Age Publications. New Delhi.
7. Power Electronics by S Rama Reddy, Narosa Publishing House Pvt. Ltd., New Delhi.

DECE-209 CONSUMER ELECTRONICS

L T P   CR
3 1 0 3.5

SECTION-A

Audio Systems: Microphones and Loudspeakers, Carbon, moving coil, cordless microphone, Direct radiating and horn loudspeaker, Multi-speaker system, Sound Recording, Magnetic Recording, Digital Recording, Optical Recording (CD system and DVD), Television
Monochrome TV: Elements of TV communication system, Scanning and its need, Need of synchronizing and blanking pulses, VSB, Composite Video Signal, Picture Tube, Camera Tube : Vidicon and Plumbicon, TV Receiver: Block diagram, function of each block, waveform at input and output of each block.

SECTION-B

Colour Television: Primary, secondary colours, Concept of Mixing, Colour Triangle, Camera tube, PAL TV Receiver , Concept of Compatibility with Monochrome Receiver, NTSC, PAL, SECAM (brief comparison), LCD and LED Television: Basic principle and working of LCD & LED TV, Cable Television: Working of Cable TV, DTH,
Consumer Appliances: Principle and working, Microwave Oven, Automatic Washing Machine, Photostat Machine, Digital Camera

RECOMMENDED BOOKS
1. Audio and Video Systems by RG Gupta, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Consumer Electronics by Deepak Arora, Eagle Prakashan, Jalandhar.
3. Colour Television-Principles & Practice by R.R Gulati , Wiley Eastern Limited, New Delhi
4. Complete Satellite & cable Television R.R Gulati New age International Publisher, New Delhi
5. Colour Television Servicing by RC Vijay BPB Publication, New Delhi
6. Colour Television & Video Technology by A.K. Maini CSB Publishers
7. Colour TV by A.Dhake
8. Consumer Electronics by Yagnik & Jain – Ishan Publication
9. Service Manuals, BPB Publication, New Delhi

DECE-210 OPTICAL FIBER COMMUNICATION

L T P   CR
3 1 0 3.5

SECTION-A
Introduction: Historical perspective, basic communication systems, optical frequency range, advantages of optical fibre communication, application of fibre optic communication,Electromagnetic spectrum used, Advantages and disadvantages of optical communication, Principle of light penetration, reflection, critical angle.
Optical Fibers and Cables: Constructional details of various optical fibers, multimode and mono-mode fibers, step index and graded index fibers, acceptance angle and types of optical fiber cables. Optical Fibers cable connectors and splicing techniques.
Losses in Optical Fiber Cable: Absorption Losses: Scattering Losses, Radiation losses, Connector losses, Bending loses, Dispersion: Types and its effect on data rate.

SECTION-B
Optical Sources: Characteristics of light used in optical communication, principle of operation of LED, different types of LED structures used and their brief description, Injection laser diode, principle of operation, different injection laser diodes, comparison of LED and ILD.
Optical Detectors: Characteristics of photo detectors used in optical communication; PIN diode and avalanche photo diode (APD), Noise in detectors.
Optical Fiber System: Optical transmitter circuit, optical receiver circuit, optical power budgeting, Multiplexing: WDM (Wavelength Division Multiplexing), Modulation in fibre optics.

RECOMMENDED BOOKS

1. Optical fiber Communication by John M Senior, Prentice Hall of India, New Delhi

2. Optical fiber Communication by J. Gower , Prentice Hall of India, New Delhi

3. Optical fiber Communication by Gerd Keiser, McGraw Hill International Editions

4. Optical Communications – Components and Systems by JH Franz and VK Jain, Narosa Publishing House, New Delhi

5. Optical Fiber Communication by Sangar and Sahdev, Uneek Publications, Jalandhar

DECE-256 NETWORK FILTERS AND TRANSMISSION LINES LAB

L T P   CR
0 0 2   1.0

List of Practicals

1. To measure the characteristic impedance of symmetrical T and Л networks.

2. To measure the image impedance of a given asymmetrical T and Л networks.

3. For a prototype low pass filter:
   a) Determine the characteristic impedance experimentally
   b) Plot the attenuation characteristic

4. To design and measure the attenuation of a symmetrical T/ Л type attenuator.

5. For a prototype high pass filter:
   a) Determine the characteristic impedance experimentally
   b) To plot the attenuation characteristic

6. a) To plot the Impedance characteristic of a prototype band-pass filter
   b) To plot the attenuation characteristic of a prototype band pass filter

7. a) To plot the impedance characteristic of m- derived low pass filter
   b) To plot the attenuation characteristics of m-derived high pass filter

8. Draw the attenuation characteristics of a crystal filter.

DECE-257 COMMUNICATION SYSTEM -1 LAB

L T P   CR
0 0 2 1.0

List of Practicals

1. To observe the waveforms at different stages of a AM transmitter.
2. To observe the waveforms at different stages of a Radio Receiver.
3. To align AM broadcast radio receiver.

4. To identify and study the various types of antennas used in different frequency ranges.

5. To plot the radiation pattern of a directional and omni directional antenna.

6. To plot the variation of field strength of a radiated wave, with distance from a transmitting antenna.

7. Familiarisation and identification of fiber optic components such as fibre optic light source, detector, connector assembly etc.

8. To assemble the fiber optic communication set up (using teaching module) and compare the transmitted signal with the output of the receiver.

9. To measure the light attenuation of the optic fibers.

DECE-259 CONSUMER ELECTRONICS LAB

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1.   To plot the frequency response of a Microphone.

2.   To plot the frequency response of a Loud Speaker.

3.   Trouble shooting of CD/DVD Player .

4.   To observe the wave forms and voltage of B/W TV Receiver.

5.   To observe the waveforms and voltages of colour TV Receiver .

6.   Fault finding of colour T.V .

7.   Demonstration of Microwave Oven .

8.   Demonstration and study of DTH System .

9.   Demonstration of Photostat Machine .

10.   Demonstration of Automatic Washing Machine .

DECE-260 OPTICAL FIBER COMMUNICATION LAB

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1. Setting up of fiber analog link.

2. Setting up to optic digital link .

3. Measurement of bending losses in optical fibers.

4. To observe and measure the splice or connector loss.

5. To measure and calculate numerical aperture of optical fiber.

6. To observe characteristics of optical source .

7. observe characteristics of optical defector .

8. To connect a fiber with connector at both ends.

9. Introduction to various components and tools used in optical fiber communication.

DHSS-201 GENERIC SKILLS AND ENTREPRENEURSHIPS

L T P CR
3 0 0 3.0

SECTION-A

Introduction to Generic Skills: Importance of Generic Skill Development (GSD), Global and Local Scenario of GSD, Life Long Learning (LLL) and associated importance of GSD.

Managing Self: Knowing Self for Self Development: Self-concept, personality, traits, multiple intelligence such as language intelligence, numerical intelligence, psychological intelligence etc. Managing Self: Physical, Personal grooming, Health, Hygiene, Time Management, Managing Self Intellectual development: Information Search: Sources of information, Reading: Purpose of reading, different styles of reading, techniques of systematic reading, Note Taking: Importance of note taking, techniques of note taking, Writing: Writing a rough draft, review and final draft. Managing Self Psychological: Stress, Emotions, Anxiety-concepts and significance, Techniques to manage the above

Managing in Team: Team - definition, hierarchy, team dynamics, Team related skills-sympathy, empathy, co-operation, concern, lead and negotiate, work well with people from culturally diverse background, Communication in group - conversation and listening skills

SECTION-B

Task Management: Task Initiation, Task Planning, Task execution, Task close out, Exercises/case studies on task planning towards development of skills for task management

Problem Solving: Prerequisites of problem solving- meaningful learning, ability to apply knowledge in problem solving, Different approaches for problem solving, Steps followed in problem solving, Exercises/case studies on problem solving.

Entrepreneurship: Introduction: Concept/Meaning and its need, Competencies/qualities of an entrepreneur, Entrepreneurial Support System e.g., District Industry Centres (DICs), Commercial Banks, State Financial Corporations, Small Industries Service Institute (SISIs), Small Industries Development Bank of India (SIDBI), National Bank of Agriculture and Rural Development (NABARD), National Small Industries Corporation (NSIC) and other relevant institutions/organizations at State/National level.

RECOMMENDED BOOKS

1. Generic skill Development Manual, MSBTE, Mumbai.

2. Lifelong learning in Global Knowledge Economy, Challenge for Developing countries – World Bank Publication

3. Towards knowledge society, UNESCO Paris Publication

4. Your Personal Pinnacle of Success by DD Sharma, Sultan Chand and Sons, New Delhi

5. Human Learning Ormrod

ਪ੍ਰੋਫੈਸ਼ਨਲ ਡਿਪਲੋਮਾ ਕੋਰਸਾਂ ਲਈ ਕੁਆਲੀਫਾਇੰਗ ਪੰਜਾਬੀ ਸਿਲੇਬਸ

ਸਮਾਂ : 3 ਘੰਟੇ   ਲਿਖਤੀ : 60 ਅੰਕ

ਪੀਰੀਅਡ : 2 ਪ੍ਰਤੀ ਹਫ਼ਤਾ   ਪਾਸ ਅੰਕ : 35 %

ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ : 40 ਅੰਕ

1.   ਪੇਪਰ ਦੇ ਤਿੰਨ ਭਾਗ ਹੋਣਗੇ ।

ਭਾਗ ਪਹਿਲਾ : ਪੰਜਾਬੀ ਸਾਹਿਤ

(ੳ) ਕਵਿਤਾ : 1 . ਵਿਦਿਆ ਵਿਚਾਰੀ : ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ (1469) 2 . ਇਸ਼ਕ ਦੀ ਨਵੀਂਓ ਨਵੀਂ ਬਹਾਰ : ਬੁੱਲ੍ਹੇ ਸ਼ਾਹ (1680) 3 . ਤਾਜ ਮਹੱਲ : ਪ੍ਰੋ . ਮੋਹਨ ਸਿੰਘ   4 . ਅੱਜ ਆਖਾਂ ਵਾਰਸ ਸ਼ਾਹ ਨੂੰ : ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ 5 . ਜੀਵਨ : ਬਾਵਾ ਬਲਵੰਤ

(ਅ) ਕਹਾਣੀ : 1 . ਮੈਨੂੰ ਜਾਣੈ : ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ 2 . ਆਪਣਾ ਦੇਸ: ਸੰਤੋਖ ਸਿੰਘ ਧੀਰ

(ੲ) ਇਕਾਂਗੀ ਨਾਟਕ 1 . ਮਾਂ ਦਾ ਡਿਪਟੀ : ਆਈ . ਸੀ . ਨੰਦਾ

ਭਾਗ ਦੂਜਾ : ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਦੀ ਜਾਣ ਪਛਾਣ

1 . ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ : ਡਾ . ਜਸਵਿੰਦਰ ਸਿੰਘ 2 . ਪੰਜਾਬ ਦੇ ਰਸਮ   ਰਿਵਾਜ – ਡਾ . ਐੱਸ . ਐੱਸ . ਵਣਜਾਰਾ ਬੇਦੀ 3 . ਪੰਜਾਬ ਦੀਆਂ ਨਕਲਾਂ: ਪਿਆਰਾ ਸਿੰਘ ਖੁੰਡਾ

ਭਾਗ ਤੀਜਾ : ਪੰਜਾਬੀ ਭਾਸ਼ਾ

1 . ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਬਣਤਰ : ਡਾ . ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ 2 . ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਇਤਿਹਾਸ : ਡਾ . ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ

ਅੰਕ ਵੰਡ:

ਪੁਸਤਕ ਦੇ ਤਿੰਨ ਭਾਗ ਹਨ। ਪੰਤੂ ਪ੍ਰਸਨ ਪੱਤਰ ਦੋ ਭਾਗਾਂ ਵਿਚ ਹੋਵੇਗਾ । ਪ੍ਰਸਨ ਪੱਤਰ ਦਾ ਪਹਿਲਾਂ ਭਾਗ ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਉੱਤੇ ਅਧਾਰਿਤ ਹੋਵੇਗਾ । ਇਸ ਭਾਗ ਦੇ ਕੁੱਲ 36 ਅੰਕ ਹਨ। ਪ੍ਰਸਨ ਪੱਤਰ ਦਾ ਦੂਜਾ ਭਾਗ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਉੱਤੇ ਅਧਾਰਿਤ ਹੋਵੇਗਾ । ਇਸ ਭਾਗ ਦੇ ਕੁੱਲ 24 ਅੰਕ ਹੋਣਗੇ ਅਤੇ ਇਸ ਵਿੱਚ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਦੇ 12-12 ਅੰਕ ਹੋਣਗੇ ।

1)   ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਦੇ ਤਿੰਨ ਉੱਪ ਭਾਗ ੳ, ਅ ਅਤੇ ੲ ਹਨ । ਇਨ੍ਹਾਂ ਤਿੰਨਾਂ ਉੱਪ ਭਾਗਾਂ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਸੁਆਲ ਪੁੱਛੇ ਜਾਣਗੇ ।

          (ੳ) ਇਸ ਵਿੱਚ ਕੁੱਲ 12 ਪ੍ਰਸ਼ਨ ਅੌਬਜੈਕਟਿਵ ਟਾਇਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ । ਹਰ ਉਪ ਭਾਗ ਵਿੱਚ 4-4 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ । ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ ।   ਅੰਕ 3*4=12

          (ਅ) ਹਰ ਉਪ ਭਾਗ ਵਿੱਚੋਂ 5-5 ਲਘੂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ । ਜਿਨ੍ਹਾਂ ਵਿੱਚੋਂ 3-3 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ । ਉੱਤਰ ਪੰਜ ਲਾਇਨਾਂ ਤੱਕ ਹੋ ਸਕਦਾ ਹੈ ।   ਅੰਕ 9*2=18

          (ੲ) ਹਰ ਇੱਕ ਉਪ ਭਾਗ ਵਿੱਚੋਂ 1-1 ਪ੍ਰਸ਼ਨ ਪੁੱਛਿਆ ਜਾਵੇਗਾ । ਇਨ੍ਹਾਂ ਵਿੱਚੋਂ 1 ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ । ਉੱਤਰ ਇੱਕ ਸਫੇ ਤੱਕ ਸੀਮਿਤ ਹੋ ਸਕਦਾ ਹੈ ।
                         ਅੰਕ = 06

2) ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਵਿੱਚੋਂ ਪ੍ਰਸ਼ਨ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਪੁੱਛੇ ਜਾਣਗੇ ।

    ੳ) ਹਰ ਭਾਗ ਵਿੱਚੋਂ 4-4 ਪ੍ਰਸ਼ਨ ਅੌਬਜੈਕਟਿਵ ਟਾਇਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ । ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ । ਅੰਕ 4*2=8

    ਅ) ਹਰ ਭਾਗ ਵਿੱਚ 4-4 ਸੰਖੇਪ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ । ਕੁੱਲ 5 ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ । ਹਰ ਭਾਗ ਵਿੱਚੋਂ 2 ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ । ਅੰਕ 5*2=10

    ੲ) ਹਰ ਭਾਗ ਵਿੱਚੋਂ 1-1 ਪ੍ਰਸ਼ਨ ਪੁੱਛਿਆ ਜਾਵੇਗਾ । ਇੱਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ । ਉੱਤਰ ਇੱਕ ਸਫੇ ਤੱਕ ਸੀਮਿਤ ਹੋ ਸਕਦਾ ਹੈ ।   ਅੰਕ = 06

ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ ਉਪਰੋਕਤ ਸਿਲੇਬਸ ਤੇ ਹੀ ਅਧਾਰਿਤ ਹੋਵੇਗੀ । ਇਸ ਦੀ ਵਿਧੀ ਪੈਕਟੀਕਲ ਵਾਲੀ ਹੋਵੇਗੀ ।

THREE YEAR POLYTECHNIC DIPLOMA
(Electronics and Communication Engineering)
Third Year, 5th SEMESTER
Batch 2015 onwards
(Session 2016-2017)

SCHEME OF PAPERS

Course No.	TITLE	Credits
DPRJ-351	One Semester Training In Industry	20

Breakup of Marks:-

INDUSTIAL VISIT BY FACULTY COORDINATOR (150 MARKS)

Within Six month of commencement of Training: Evaluation by Faculty Coordinator in consultation with Industrial Coordinator during industrial visit

Presentation: 60 Marks

Viva-voce: 60 Marks

Report (Hard Copy):30 Marks

Total 150 Marks

EVALUATION BY A TEAM OF FACULTY MEMBERS IN THE INSTITUTE (250 MARKS)

(Within one week of completion of the training)

Presentation: 100 Marks

Viva-voce: 100 Marks

Final Report (Hard Copy): 50 Marks

Total 250 Marks

The final presentation and viva-voce will be conducted jointly by the faculty coordinator, nominee of the Head to be appointed by the Head of the Department.

The letter grade will be awarded to the students according to marks obtained by him/her out of total 400 marks.

DPRJ-351 INDUSTRIAL TRAINING SEMESTER

L T P Credits
0 0 0   20

Industrial training semester spans over a period of One Semester.

The students shall undergo industrial training in Industry / R&D or service organizations under the joint supervision of a faculty member and an executive from the organization. The emphasis of the work undertaken is on problem identification and its techno-economic solution for the benefit of the host industry.

The industrial training must normally include identification of problem, data collection, analysis and generating solutions with cost and benefits and recommendations for their implementation.

The evaluation of the Industrial training semester should be carried out on a continuous basis and must include the evaluation by faculty coordinator during his visit(s) to the concerned industries, evaluation by faculty coordinator towards the completion of the semester and the final evaluation in the Institute by a committee of faculty members.

THREE YEAR POLYTECHNIC DIPLOMA

(Electronics and Communication Engineering)

Third Year, 6th SEMESTER

Batch 2015 onwards

(Session 2016-2017)

SCHEME OF PAPERS

CODE	TITLE OF PAPER	LOAD			
		L	T	P	CR.
DECE-301	Wireless and Mobile Communications	3	1	0	3.5
DECE-302	Microwave and Radar Engineering	3	1	0	3.5
DECE-303	Communication Systems-II	3	1	0	3.5
DECE-351	Wireless and Mobile Communication Lab*	0	0	2	1.0
DECE-352	Microwave and Radar Engineering Lab*	0	0	2	1.0
DECE-353	Communication Systems-II Lab*	0	0	2	1.0
DECE-354	Project Lab*	0	0	4	2.0
	Elective –I**	3	1	0	3.5
	Elective –II***	3	1	0	3.5
	Total	15	5	10	22.5

*   DECE 351, DECE 352, DECE 353, DECE 354 are practical papers only. There will not be any theory examination for these papers.

** Elective –I
   (1) Microcontroller & applications (DECE-304)
   (2) Medical Electronics (DECE-305)
   (3) VLSI System Design (DECE-306)

***Elective –II
   (1) Computer Networking   (DCPE-303)
   (2) Network Security (DCPE-307)
   (3) Personal Computer Organization (DCPE-308)

(DECE-301) WIRELESS AND MOBILE COMMUNICATIONS

L T P   CR
3 1 0   3.5

SECTION -A

Wireless Communication: Basics, Advantages of wireless communication, Electromagnetic waves, Frequency Spectrum used, Paging system, Cordless Telephone System, Cellular Telephone System, Comparison of above wireless communication systems, Propagation considerations
Cellular Concept: Cell area, Capacity of cell, Frequency Response, Co-channel Interference, Adjacent channel Interference, Power Control for reducing Interference, Improving coverage and capacity in cellular system, Cell Splitting, Sectoring, Repeater for Range Extension.

SECTION -B
Multiple Access Techniques for Wireless Communication: Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Spread Spectrum Multiple Access (SSMA), Frequency hopping spread Spectrum (FHSS), Comparison of FDMA/TDMA/CDMA
Mobile Communication Systems: Advanced Mobile Phone System (AMPS) - Operation of AMPS, Working of AMPS Phone System, Introduction of Global Systems for Mobile Communication (GSM) and its architecture, Introduction of CDMA System, comparison of CDMA and GSM Systems, Introduction of GPRS and GPS System, Introduction to DTH, Blue tooth, Wi-Fi and RDFI.

RECOMMENDED BOOKS

1.   Wireless Communications, Principles and Practice, by Thedore S.Rappaport.

2.   Wireless Communications by Singal, Tata McGraw Hill Education Pvt Ltd , New Delhi

3.   Wireless Communications by Misra, Tata McGraw Hill Education Pvt Ltd , New Delhi

4.   Introduction to Wireless and Mobile Systems, by Dharma Prakash Agarwal, Qing-An zeng.

5.   Wireless Communications and Networking, by William Stallings.

6.   Mobile and Personal Communication Systems and Services, by Raj Pandya,
       Prentice Hall of India, New Delhi

(DECE-302) MICROWAVE AND RADAR ENGINEERING

L T P   CR
3 1 0   3.5

SECTION -A

Introduction to Microwaves: Introduction to microwaves and its applications, Classification on the basis of its frequency bands (HF, VHF, UHF, L, S, C, X, KU, KA, mm, SUB, mm), Microwave Devices, Basic concepts of thermionic emission and vacuum tubes, Effects of inter-electrode capacitance, Lead Inductance and Transit time on the high frequency performance of conventional vacuum tubes, and steps to extend their high frequency operations.

Microwave Tubes And Circuits: Construction, characteristics, operating principles and typical applications of the following devices (No mathematical treatment)

- Multi cavity klystron
- Reflex klystron
- Multi-cavity magnetron

- Traveling wave tube
- Gunn diode and
- Impatt diode

SECTION –B

Microwave Components: Constructional features, characteristics and application of tees, bends, matched termination, twists, detector, mount, slotted section, directional coupler, fixed adapter.

Radar Systems: Introduction to radar, its various applications, radar range equation (no derivation) and its applications, Block diagram and operating principles of basic pulse radar. Concepts of ambiguous range, radar area of cross-section and its dependence on frequency. Block diagram and operating principles of CW (Doppler) and FMCW radars, Block diagram and operating principles of MTI radar, Radar display- PPI.

RECOMMENDED BOOKS

1.   Microwave Devices and Components by Sylio, Prentice Hall of India, New Delhi

2.   Electronics Communication by Roddy and Coolen

3.   Electronics Communication System by KS Jamwal, Dhanpat Rai and Sons, Delhi

4   Microwave Engineering by Das, Tata McGraw Hill Education Pvt Ltd , New Delhi

5   Microwave & Radar Engineering by Shilpa; Eagle Prakashan Jalandher

(DECE-303)COMMUNICATION SYSTEMS – II

L T P   CR
3 1 0   3.5

SECTION -A

Introduction: Basic block diagram of digital and data communication systems. Their comparison with analog communication systems. Coding-Introduction to various common codes 5 bit Baudot code, 7 bit ASCII, ARQ, EBCDIC, Code error detection and correction techniques - Redundancy, parity, block check character (BCC), Vertical Redundancy check (VRC), Longitudinal Redundancy Check (LRC), Cyclic Redundancy check (CRC), Hamming code

Digital Modulation Techniques: Basic block diagram and principle of working of the following:
- Amplitude shift keying (ASK): Interrupted continuous wave (ICW), two tone modulation
- Frequency Shift keying (FSK)
- Phase shift keying (PSK), Quadrature Phase Shift Keying(QPSK)
- Spread Spectrum Techniques, Frequency Hopping Technique

UART, USART: Their need and function in communication systems

SECTION -B

Modems: Need and function of modems, Mode of modems operation (low speed, medium speed and high speed modems). Modem interconnection, Modem data transmission speed, Modem modulation method, Modem interfacing (RS 232 Interface, other interfaces).

Telemetry: Radio-telemetry, and its application. Block diagram of TDM and FDM telemetry system Electronic Exchange- Typical telephone network. Various switching offices (Regional Centre, District Centre, Toll Centre, Local Office) and their hierarchy, Principles of space division switches. Basic block diagram of a digital exchange and its working, combined space and time switching: Working principle of STS and TST switches, Functions of the control system of an automatic exchange.

Facsimile (FAX): Basic idea of FAX system and its applications. Principle of operation and block diagram of modern FAX system, important features of modern FAX machines.

RECOMMENDED BOOKS

1. Electronic Communication Systems By George Kennedy Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Communication Systems-II by Yogesh Chhabra
3. Communication system By A.K. Gautam S.K. Kataria Sons, Delhi
4. Communication System – II by Priti Srivastv – Ishan Publications
5. Electronics communication by K.S. Jamwal, Dhanpat Rai and Sons, Delhi

(DECE-351) WIRELESS AND MOBILE COMMUNICATIONS LAB

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1. Study the features, specification and working of cellular mobile

2. Signal strength measurement of various points from a transmitting antenna/cordless phone

3. Measurement of range for a cordless phone

4. Demonstration of Base Trans Receiver(BTS) with nearby cellular tower

5. Observing call processing of GSM trainer Kit.

6. Observing call processing of CDMA trainer Kit.

7. Practice of setting GPRS on Mobile phone, Repair of a (GSM) and a (CDMA) mobile phones, Measurement of cell boundary (time consuming project) Data transfer using blue tooth

8. Visit to local nearby telephone exchange.

(DECE-352) MICROWAVE AND RADAR ENGINEERING LAB

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1.   To measure electronics and mechanical tuning range of a reflex klystron

2.   To measure VSWR of a given load.

3.   To measure the Klystron frequency by slotted section method

4.   To measure the directivity and coupling of a directional coupler.

5.   To plot radiation pattern of a horn antenna in horizontal and vertical planes.

6.   To verify the properties of magic tee.

7.   To carry out installation of a dish antenna.

(DECE-353)COMMUNICATION SYSTEMS – II

L T P   CR
0 0 2   1.0

LIST OF PRACTICALS

1. Transmission of hamming code on a serial link and its reconversion at the receiving end.

2. Observe wave forms at input and output of ASK and FSK modulators

3. To transmit parallel data on a serial link using USART

4. Transmission of data using MODEM.

5. Observe wave forms at input and output of a TDM circuit

6. To study the construction and working of a telephone handset

7. To study the construction and working of a FAX machine.

8. Visit of nearby FM Radio station .

(DECE-304) MICROCONTROLLERS AND APPLICATIONS

L T P   CR
3 1 0   3.5

SECTION -A

Introduction: Microcontroller series (MCS) – 51, Overview**,** Architecture of 8051/8031 Microcontroller, Pin details, I/O Port structure, Memory Organization, Special Function Registers (SFRs) External Memory

Instruction Familiarization: Instruction Set, Addressing Modes, Arithmetic, Logical, Jump loop and call instructions, single bit instructions, time delay generation & calculation, bit manipulation and programming.

SECTION -B

Interrupt & Embedded Device Programming: Timer operation, Serial Port, operation Interrupts, Assembly/C programming for Micro controller, Assembler directives, Assembler operation, Compiler operations, De bugger, Simulator

Design and Interface: keypad interface, 7- segment interface, LCD, stepper motor. A/D, D/A, RTC interface. Introduction of PIC Micro controllers, Application of Micro controllers in Communication System

RECOMMENDED BOOKS:

1. Microcontrollers by Deshmukh, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Micro Controller & Embedded System by Deepak Arora, Eagle Prakashan, Jalandhar.
3. Microcontrollers by Ayala
4. Microcontrollers by Mazidi, Pearon Education, Delhi
5. Microcontrollers by Neil Makanzi, Pearon Education, Delhi
6. Embedded GSM Applications

(DECE-305) MEDICAL ELECTRONICS

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SECTION -A

Anatomy and physiology: Elementary ideas of cell structure Heart and circulatory system, Central nervous system, Muscle action, Respiratory system, Body temperature and reproduction system

Overview of Medical Electronics: Equipment, classification, application and specifications of diagnostic, therapeutic and clinical laboratory equipment, method of operation of these instruments

Electrodes: Bioelectric signals, Bio electrodes, Electrode, Electrode tissue interface, contact impedance, Types of Electrodes, Electrodes used for ECG, EEG.

SECTION –B

Transducers: Typical signals from physiological parameters, pressure transducer, flow transducer, temperature transducer, pulse sensor, respiration sensor.

Bio Medical Recorders: Block diagram description and application of following instruments- ECG Machine, EEG Machine, EMG Machine

Patient Monitoring Systems: Heart rate measurement, Pulse rate measurement, Respiration rate measurement Blood pressure measurement, Principle of defibrillator and pace mark, Safety Aspects of Medical Instruments, Gross current shock, Micro current shock, Special design from safety consideration, Safety standards.

RECOMMENDED BOOKS

1.   Handbook of Biomedical Instrumentation by RS Khandpur,Tata McGraw Hill
         Education Pvt Ltd, New Delhi
2.   Biomedical Instrumentation by Cromwell,
3.   Modern Electronics Equipment by RS Khandpur, TMH, New Delhi
4.   Introduction to Biomedical Electronics by Edward J. Perkstein; Howard Bj, USA
5.   Medical Electronics by Deepak Arora; Eagle Prakashan Jalandher

(DECE-306) VLSI SYSTEM DESIGN

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SECTION –A

Overview of VLSI: Introduction to Computer-aided design tools for digital systems. Hardware-description languages, Introduction to VHDL, Data objects, Classes and data types, Operators, Overloading, Logical operators. Types of delays, Entity and Architecture declaration. Introduction to behavioral dataflow and structural models.

VHDL Statements: Assignment statements, sequential Statements and process, Conditional statements, Case statements, concept and use of Concurrent statements.

SECTION –B

Combinational Circuit Design: VHDL models and simulation of combinational circuits such as Multiplexers, Encoders, Decoders, Code converters, Comparators, Implementation of Boolean functions etc.

Sequential Circuit Design: VHDL Models and simulation of sequential circuits, Shift registers, Counters etc.

Introduction to CPLDs and FPGAs: Programmable logic devices: ROM, PLAs, GAL, PEEL, CPLDs and FPGA. FPAA (Field Programmers Analog Array)

RECOMMENDED BOOKS:

a) VLSI Technologies by SZE, Tata McGraw Hill Education Pvt Ltd , New Delhi
b) IEEE Standard VHDL Language Reference Manual(1993)
c) "Digital System Design using VHDL": Charles. H. Roth; PWS(1998)
d) VHDL-IV Edition: Perry; Tata McGraw Hill Education Pvt Ltd , New Delhi
e) VLSI Design for Analog by Geiger, Tata McGraw Hill Education Pvt Ltd , New Delhi
f) VLSI System Design by Shilpa; Eagle Prakashan Jalandher

Recommended Software:

Xilinx Synthesis Software (web pack) freely available on internet. On Xilinx.com VLSI System Design is wind software for designing (System Designing).
VLSI Learning Resource like Ex-VLSI

(DCPE-303) COMPUTER NETWORKS

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SECTION –A

Networks Basics: Definition, Networking models- Peer-to-peer Network, Server Client Network, LAN, MAN and WAN, Network Services, Topologies, OSI Reference Model, TCP/IP reference Model, Switching Techniques

Introduction to TCP/IP: Concept of physical and logical addressing, Different classes of IP addressing, special IP address, Sub netting and super netting, Loop back concept, IPV4 and IPV6 packet Format, Configuring IPV4 and IPV6

Network Connectivity: Transmission media**,** Network connectivity Devices, NICs, Hubs, Repeaters, Multiplexers, Modems, Routers and Protocols, Firewall, ATM, VOIP and Net-to-Phone Telephony, Laws and Protocols.

SECTION –B

Installation: Environmental requirements of computer system and peripherals. Sight preparation and design of computer rooms. Testing specifications and installation of computer systems and peripherals.

Sharing of devices on Networks: Installation and management of network sharing tools i.e squidpoxy, managing IP addresses, 2-Tier, 3-Tier Network Architecture

Network Administration / Security: Client/Server Technology, Server Management, RAID management and mirroring, Hauffman codes, Cryptography

Network Trouble Shooting Techniques: Trouble Shooting process, Trouble Shooting Tools: PING,IPCONFIG, IFCONFIG, NETSTAT, TRACEROOT, Wiresharp/ Dsniffer/ Pcop

Wireless Networking: Basics of Wireless: Wireless MAN, Networking, Wireless LAN, Wi-Fi, WiMax(Broad-band Wireless) and Blue-Tooth technology

RECOMMENDED BOOKS

2. Computer Networks by Tanenbaum, Prentice Hall of India, New Delhi
3. Data Communications and Networking by Forouzan, (Edition 2nd and 4th), Tata McGraw Hill Education Pvt Ltd , New Delhi
4. Understanding Local Area Network by Neil Jenkins
5. Area Networks by Stan Schatt, Prentice Hall of India, New Delhi
6. Network+ Lab manual,- BPB Publications -by Tami Evanson
7. Computer Network by Priti Srivastav- Ishan Publication
8. Computer Network and Communications By V.K. Jain and Narija Bajaj, Cyber Tech Publications, New Delhi.
9. Linux – The complete Reference by Richard Peterson, Tata McGraw Hill Education Pvt Ltd, New Delhi.
10. Linux – Install and Configuration Black Book by Dee Annleblanc and Issac Yates, IDG Books India Private Limited, Delhi.
11. Unleashed Linux by TechMedia Publishers, New Delhi

(DCPE-307) NETWORK SECURITY

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SECTION –A
Introduction: Need for securing a network; attacks from within and external, introduction to cyber crime, cyber law-Indian Perspective (IT Act 2000), cyber ethics, ethical hacking. What is hacking, attacker.

Securing Data over Internet: Introduction to basic encryption and decryption, concept of symmetric and asymmetric key, cryptography, overview of DES, RSA and PGP. Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures.

Virus, Worms and Trojans: Definitions, preventive measures – access central, checksum verification, process neutering, virus scanners, neuristic scanners, application level virus scanners, deploying virus protection.

Computer Network Attacks: Active Attacks, Passive Attacks, Stealing Passwords, Social Engineering, Bugs and Backdoors, Authentication Failures, Protocol Failures, Information Leakage, Denial-of- Service Attacks, Botnets, Phishing Attacks.

SECTION –B
Firewalls: Definition and types of firewalls, defining access control policies, address translation, firewall logging, firewall deployment.

Intrusion Detection System (IDS): Introduction, IDS limitations – teardrop attacks, counters measures; Host based IDS set up.

Virtual Private Network (VPN): Basics, setting of VPN, VPN diagram, configuration of required objects, exchanging keys, modifying security policy.

Disaster and Recovery: Disaster categories; network disasters – cabling, topology, single point of failure, save configuration files; server disasters – UPS, RAID, Clustering, Backups, server recovery.

OS Vulnerabilities: Study of Linux and Windows OS Vulnerability, Importance of Original Software (Due to patches for Loopholes Security Vulnerabilities)

RECOMMENDED BOOKS

1. Cryptography and Network Security by Forouzon, Tata Mc Graw Hill Education Pvt Ltd, New Delhi.
2. Cryptography and Network Security by Atul Kahate, Tata Mc Graw Hill Education Pvt Ltd, New Delhi
3. Mastering Network Security by Christ Breton; BPB Publication, New Delhi
4. Web-sites by Chris Breton, BPB Publication, New Delhi
5. Network Firewalls by Kiranjeet Syan; New Rider Publication
6. Internet Security, New Rider Publication
7. Network Security by Sood & Mahajan; Eagle Prakashan Jalandher

(DCPE-308) PERSONAL COMPUTER ORGANIZATION

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SECTION –A

Mother Board: Introduction to different type of mother boards, Single Board Based System, Block diagram of motherboard. Installation of Computer System.
Buses and Ports: Different type of Buses PCI, SCSI and Serial and Parallel ports (COM ports), Ports COM 1, LPTI, USB. RS 232 C, use of computer for instrumentation.
Memory: Principle and Construction of Floppy Disk Drive and Hard Disk Drive (HDD), Floppy Disk Controller & Hard Disk Controller. Pen Drives, common faults with hard disk drive and floppy disk drive, RAM Module.

SECTION –B

Keyboard and Mouse: Block Diagram of keyboard Controller, keyboard switches, and keyboard faults, mouse, common faults with mouse. Introduction to scanner, digitizer.
CRT Display Devices: Block Diagram, Principle of operation of Computer Monitor, Difference between TV & Computer Monitor. Video display Adaptors (monochrome and Color), introduction to solid state displays
Printers: Printing Mechanism, Construction and working principles of Dot
Matrix Printer, Inkjet Printer, Laser Printer, Printer Controller, Centronics
Interface, Signals from PC to Printer and Printer to PC.

RECOMMENDED BOOKS

3. PC Organisation by S. Chowdhury, Dhanpat Rai & Sons, Delhi

4. Personal Computer Organisation by Gourav Gupta, Eagle Prakashan, Jalandhar.

5. IBM PC Colons by Govinda Rajalu, Tata McGraw Hill Education Pvt Ltd, New Delhi

6. Text Book by Mark Minasi

7. P.C. Organinsation by Priti Srivastv- Ishan Publications

(DECE-354) PROJECT LAB

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Related project activities are given below:

> Projects related to designing small electronic equipment / instruments.

> Projects related to increasing productivity in electronic manufacturing areas.

> Projects related to quality assurance.

> Projects connected with repair and maintenance of plant and equipment.

> Projects related to design of PCBs.

> Projects related to suggesting substitutes of electronics components being used.

> Projects related to design of small oscillators and amplifier circuits.

> Projects related to design, fabrication, testing and application of simple digital circuits and components.

> Projects related to microprocessor/microcontroller based circuits/ instruments.

Note- Any other project relevant to the branch Electronic & communication Engineering comes under this section.