SYLLABUS FOR
M.SC. (ELECTRONICS)
(SEMESTER SYSTEM)

EFFECTIVE FROM JULY 2011

DEPARTMENT OF PHYSICS & ELECTRONICS
DR.RAM MANOHAR LOHIA AVADH UNIVERSITY
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DR.RAM MANOHAR LOHIA AVADH UNIVERSITY
DEPARTMENT OF PHYSICS & ELECTRONICS
M.Sc. (ELECTRONICS) SYLLABUS
SEMESTER I TO IV

M.SC. PREVIOUS- SEMESTER I	**Th+S***
ELE 101: Mathematical Techniques And Network Analysis	70+30
ELE 102: Physics of Electronic Materials	70+30
ELE 103: Semiconductor Devices And Electronic Circuits	70+30
ELE 104: Control Systems	70+30
Practical-I:Devices, Circuits And SimulationLab	200
TOTAL MARKS OF FIRST SEMESTER	**600**

M.SC. PREVIOUS -SEMESTER II	
ELE 201: Communication Technique and Networking	70+30
ELE 202: Programming With C And C++	70+30
ELE 203: Electromagnetics, Propagation And Antenna	70+30
ELE 204: Power Electronics	70+30
Practical-II: Programming Lab (C,C++& MATLAB)	200
Summer Training	
TOTAL MARKS OF SECOND SEMESTER	**600**

M.SC. FINAL-SEMESTER III	
ELE 301: Electronic Instrumentation	70+30
ELE 302: Microwave Electronics	70+30
ELE 303: I C Technology &VLSI Design	70+30
ELE 304: Integrated & Digital Electronics Circuits	70+30
Practical-III: Integrated Circuit And Communication Lab.	200
TOTAL MARKS OF THIRD SEMESTER	**600**

M.SC. FINAL -SEMETER IV	
ELE 401: Digital Signal Processing	70+30
ELE 402: Radar, TV and Satellite Communication	70+30
ELE 403: Microprocessor and Microcontroller	70+30
ELE 404: Optoelectronics and Optical Communication	70+30
Practical-IV: Microprocessor and Digital Electronics Lab.	100
Projects/Seminar	100
TOTAL MARKS OF FOURTH SEMESTER	**600**

GRAND TOTAL	**2400**

***Sessional Marks Distribution**

1. Test-1:10 Marks
2. Test-2:10 Marks
3. Student Response in Class: 5 Marks
4. Student Attendance: 5 Marks

PREVIOUS YEAR- SEMESTER I

PAPER-I: ELE 101: MATHEMATICAL TECHNIQUES AND NETWORK ANALYSIS

UNIT-I: Definition of Fourier Series, calculation of coefficients in easy cases, Dirichlets Condition,Wave Symmetry, Fourier series exponential term, Fourier analysis of half, full wave rectifiers, Fourier Transform,Theorems,Parseval Theorem,Fourier Transform Of Different Functions.

UNIT-II: Laplace Transform and its existence, Laplace Transform of standard functions,properties of Laplace Transform, Laplace Transform of periodic functions, LaplaceTransform of some special functions, inverse Laplace Transform, circuit analysisusing Laplace Transform (R, RC, LC, RLC circuits).Inverse Laplace Transform

UNIT–III: Network elements Transformation of energy sources, loop variable and node variable analysis, Y-Δ transformation, Transfer impedance/admittance, **Network theorems**: Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power transform theorem.

UNIT–IV: Two port network, Open circuit Impedance Parameter, Short circuit Admittance parameter, Transmission parameter, Inverse transmission parameter, Hybrid parameter, Inverse hybrid parameter, hybrid parameter in terms of other parameter, Output impedance, Image impedance, Network functions.

Texts and References:

1. Network Analysis – Van Valkenberg– PHI

2. Network Analysis And Synthesis by Franklin F .Kuo, John Wiley And Sons

3. Networks And Systems D .Roy Chaudhary

PAPER-II: ELE 102: PHYSICS OF ELECTRONIC MATERIALS

UNIT-I: Crystal Structure: Crystal structures, classification of crystals, lattices, reciprocal lattice, Miller indices, amorphous materials, Electronic structure and related properties, Bloch theorem, phonons, Nearly Free electron theory, introduction to tight binding and various band structures, Band structure calculation methods, thermal conductivity due to electrons and phonons, perturbation theory

UNIT-II: Semiconductors: Direct and indirect band gap methods to determine the forbidden gap electronic and hole transport in semiconductors, electrical parameters, carrier concentration, mobility, temperature dependence, experimental methods to study the electrical parameters, thermo electric effect. Hall effect, intrinsic and extrinsic semiconductors, electrons and phonons in semiconductors, Optical properties of Si and GaAs

UNIT-III: Dielectric And Magnetic Materials: Dielectric properties, electronic polarisability, Clausius Mossotti relation, dielectric constant static and frequency dependence, Kramer-Kronig relation, damped oscillation, Piezoelectric properties, polymers and their properties. Magnetic and Electro-optical properties, Magnetism & various contributions to para and dia magnetism, Fero and Ferri magnetism and ferrites, Magnons and dispersion relation, antiferromagnetism, domains and domain walls, coercive force, hysterisis, methods for parameters measurements.

UNIT-IV:Superconductivity and Liquid Crystals:,Different Properties Of SuperconductorMeissner effect,London equation,BCS theory,Josephson effect,High Temperature Superconductor,Types of liquid crystals and their mesomorphous phases, Elementary theory of order, Transition Metal Alloys.

RECOMMENDED BOOKS

1. A First Course In Material Science by Raghvan, Mac-Graw Hill
2. Solid State Electronics by Mermin And Ashcroft
3. A first Course In crystallography by O.N.Srivastava And A.R.Verma
4. Liquid Crystals by S.Chandrsekhar

PAPER-III: ELE 103: SEMICONDUCTOR DEVICES AND ELECTRONIC CIRCUITS

UNIT-I: Bipolar Junction Transistors: Transistor action, configurations and characteristics, current gains, h-parametersnd analysis of transistor amplifier using h-parameter, inter conversions in different configuration, thermal instability and bias stabilization, cascaded transistors.

UNIT-II: Multistage Amplifiers: BJT at high frequencies, frequency response of RC coupled amplifiers and transformer coupled amplifier.

UNIT-III: Power Amplifiers: Classification of amplifiers, transformer coupled class- A power amplifier, efficiency and crossover distortion, class- B push pull amplifier, single tuned and double tuned amplifier.Classification of feedback amplifiers, effect of negative feedback, stability and response of feedback amplifiers,

UNIT-IV: Oscillators: General theory of operation, Phase Shift, Wien's Bridge, Hartley, Collpit and Crystal Oscillators.

References:

1. Electronic Devices & Circuits: Mottershed
2. Electronic Devices & Circuits: Milliman and Halkias
3. Solid state Electronic devices: B. G. Streetman
4. Functional Electronics: Ramnan

PAPER-IV: ELE 104: CONTROL SYSTEM

UNIT-I: Introduction, terminology and Feedback characteristics of control system definitions, closed and open loop systems, Transfer functions, block diagrams,Reduction Algenra,signal flow graphs.

UNIT-II: Time domain analysis and Root Locus Techniques:
Standard test signals, time domain performance of control systems, transient response of the first, the second order systems, stability, steady state errors, effect of adding zero to the system, Routh stability criterion. Root locus techniques: The root locus concept, construction of root locus and analysis of control system,

UNIT-III : Frequency domain analysis and Basic control actions:
Correlation between time and frequency response, Polar plots, Bode plots, experimental determination of transfer function, log magnitude versus phase plots, Nyquist stability criterion,

UNIT-IV: Basic actions and industrial control:
Proportional, derivative and integral controllers, combined controllers, Effect of integral and derivative control on system, performance, PID controller.

Reference Books :

1. Control system Engineering – J.J. Nagrath, M. Gopal, 2nd Edition, Wiley Eastern Ltd.
2. Modern Control Engineering – K. Ogata, Prentice Hall of India.
3. Automatic control systems- B.C. Kuo, Prentice Hall of India.

PREVIOUS YEAR-SEMESTER II

PAPER-I: ELE 201: COMMUNICATION TECHNIQUES AND NETWORKING

UNIT I: Classification of signals, Correlation, Auto correlation and Cross-correlation function, Convolution. Probability and events, Random signals, Random variable and Random Process, Statistical averages and moments, Probability density function and Power spectral density, Gaussian distribution. Noise, Noise Calculation, Noise Temperature, Noise figure

UNIT II: amplitude modulation system, maximum allowable modulation, square law demodulator, spectrum of amplitude modulation system, balanced modulators, SSB,VSB and CSS modulation system, angle modulation, phase and frequency modulation and relation, spectrum of FM system, Armstrong Frequency modulation system, frequency demodulators

UNIT III: analog to digital conversion, sampling theorem (low pass and High pass Signals), PAM, Quantization of signals, quantization error, PCM, Differential PCM, Delta Modulation, ASK, PSK, FSK, Time division Multiplexing, Frequency division Multiplexing

Unit IV: Introduction to data communication, layered network architecture (OSI and TCP/IP), Public Telephone Network, Cellular Telephone system, data communication codes, error detection and error control, Modems, LAN topologies, Division Multiplexing (WDM) and its network implementation

Reference Books:

1. Electronics Communication Systems: Fundamental through advanced By Wayne Tomasi, Pearson Education Asia
2. Elements of engineering electromagnetic by Narayaaa Rao, PHI
3. Mobile communication Engineering- W.Y.C. Lee, McGraw Hill.
4. Mobile Cellular Telecommunication: Analog and Digital Systems, William C.Y. Lee, Mc Graw Hill
5. Communication principles by Toub Shilling
6. Data Communication and Networks by Wayne Tomasi, Pearson Education Asia

PAPER-II: ELE 202: PROGRAMMING WITH C AND C++

UNIT – I: Algorithm / pseudo code, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation.
Input-output statements, statements and blocks, if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels, programming examples.

UNIT – II: Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, block structure, user defined functions, Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays, standard library functions, recursive functions, header files, example c programs.

UNIT – III: pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, type def, bitfields, dynamic memory managements functions, command line arguments, Input and output - concept of a file, text files and binary files, streams, standard I/o, Formatted I/o, file I/o operations, error handling, c program examples

UNIT- IV: Principle of Object Oriented Programming, Software evaluation, OOP paradigm, Basic concept of OOP, Benefits of OOP, Application of OOP, Introduction to C++,Tokens, Keywords, Identifiers, Constants, Operators, Manipulators, Expressions and control structure, Pointers, Functions, Function prototyping, Parameters passing in functions, Values Return by functions, Inline functions – friend and virtual functions, Classes, objects, constructors and destructors, Operator overloading, Type conversions , Type of constructors , Function over loading

RECOMMENDED BOOK

1. LET US C BY YASHAVANT KANETKAR ,BPB PUBLICATION, 3RD EDITION
2.Exploring C by Kanetkar
3.C++ by Balaguru Swamy

PAPER-III: ELE 203: ELECROMAGNETICS, PROPAGATION AND ANTENNA

UNIT I: electromagnetic wave, plane wave in non conducting media, polarization, energy flux in plane wave, radiation pressure and momentum, plane wave in conducing media, skin effect, electromagnetic wave in bounded media

UNIT II: electromagnetic radiation, retarded potentials, radiation from an oscillating dipole, linear antenna, Lienard- Wiechart potentials, potential for charge in uniform motion(Lorentz formula), field of an accelerated charge, radiation from an accelerated charged particle a low velocity, radiation from charged particle moving in circular orbit, electric quadruple radiation

UNIT III: basic antenna concept, parameters (patterns, beam area, radiation intensity, beam efficiency, directivity and again, effective aperture, scattering aperture, physical aperture, effective height), Frii's transmission formula, duality of antenna, twin line antenna, centre fed dipole antenna, antenna field zone, shape impedance consideration

UNIT IV: short electric dipole, thin linear antenna (λ/2, 3 λ/2, and full wave), field at any distance from centre fed antenna, array of dipole (broadside and endfire case), antenna with parasitic elements (Yagi- Uda), horn antenna and micro- strip antenna

REFERENCE BOOKS

1 . Electromagnetics theory and its applications by U.Sinha;
2. Introduction to electrodynamics by David J. Griffithe , PHI
3. Elements of engineering electromagnetics by Narayaaa Rao, PHI
4.Elements Of Electromagnetics by Matthew N. O. Sadiku
5.Electromagnatics by B.P.Loud
6. Anteena By Kaurse

PAPER-IV: ELE 204: POWER ELECTRONICS

UNIT-I: Linear electronics Verses power electronics, applications of power electronics, Construction, operating principles, ratings and operating parameters of following devices - SCR, Thyristors types :- phase control, inverter grade, asymmetrical (ASCR) reverse conducting, (RCT), Gate assistated Turn off (GATT), Bidirectional diode (DIAC), TRIAC, SUS, SBC, SCS, LASCR, power transistors, power MOSFETS, IGBT, SITS, GTO, FCT, SITH, MCT, PIC.

UNIT- II: Phase angle control, single phase, half wave control, full wave control, Half controlled bridge, voltage doubler, Three phase fully controlled, bridge, three phase half control bridge, selection of converter circuits, firing circuits, triggering circuits.

UNIT -III: Control of dc to dc converter, step down (Buck) converter, step-up (Boost) converter, Buck-Boost converter, Cuk-dc-dc converter fill bridge dc to dc converter. Cycloconverters Dual converters, microprocessor based firing schemes for dual converter. Classification, basic concepts, load resonant converter, zero voltage and /or zero current switching. Forced commutated thyrister inverters. i.e. Auxillary commutated inverters, McMurray commutated inverter

UNIT –IV: Basic concepts, classification, series inverter, self commutated inverters, parallel inverters, single-phase bridge voltage source invecter, three phase bridge, voltage control of single phase and three phase inverters, current source inverters, PWM inverters, Single phase, three phase AC regulators. Switching dc power supplies linear power supplies, switching power supplies, dc-dc converter with electrical isolation, control of switch mode P/S, P/S protection, designing concepts, Power Line, disturbances, Power conditioners and uninterruptible power supplies.

Reference Books.:-

1. Power Electronics P.C. Sen
2. Power Electronics R.M. Jalnekar & N.B. Pasalkar
3. Thyristor power Controllers. C.K Dubey, S. R. Doradla, A. Joshi & R.M. Sinha
4. Electronic drives- Concept & Applications –Vedam Subrahmanyam(THM)
5. Power Semiconductor drives-S.B.Dewan, G.R.Sleman, A.Strauphan (WileyInt.Publ.-John Wiley Sons.)
6. Power Electronics –J.S.Katre (Technover Publication

FINAL YEAR-SEMESTER III

PAPER-I: ELE 301: ELECTRONIC INSTRUMENTATION

UNIT-I: Classification of Instrument, Errors in measurement, accuracy, precision, significant figures, statistical analysis, probability of error, limiting error, definition of Transducer, type of transducers active and passive(reactive, inductive and capacitive)

UNIT-II: Wheatstone bridge, A.C. Bridge and their application, Wheatstone bridge, Hay bridge, Schering bridge, photoelectric effect, Hall effect, piezoelectric effect thermoelectric effect and their applications

UNIT-III: Electronic multimeter, Digital voltmeter, Digital frequency meter, Instrument for resistance, capacitance, inductance, voltage, current, power and power-factor, Digital storage oscilloscope

UNIT-IV: Measurement of displacement, flow, torque, strain, vibration measurement, ECG, Ultra-sonography, X-ray Tomography, CT Scan

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BOOKS & REFERENCES:s

1. Modern Electronic Instrumentation and Measurement techniques by A. Helfrick, W. Cooper (PHI)
2. Measurement Systems, Applications & Design – E. O. Deoblin
3. A course in Electrical and Electronics Measurement & Instrumentation by A.K.Sawhney
4. Principles of Industrial Instrumentation: D.Patronbis,
5. Electronics Measurement and Instrumentation : Oliver and Cage
6. Electronic Instrumentation – Rajan & Sharma
7. Instrumentation: Devices & Systems – Rangan, Sarma, Mani (TMH 3rd Ed.)
8. Biomedical Instrumentation by Khandpur,TMH

PAPER-II: ELE 302: MICROWAVE ELECTRONICS

UNIT –I: Semiconductor microwave bipolar transistor, hetrojunction bipolar transistors, microwave tunnel diodes, MESFETs, CCD Devices, Gunn effect and Gunn DiodeRidley-Walkin-hilsum (RHW) theory

UNIT –II: microwave linear beam tube(O type), klystron,reflex clystron, helix travelling wave tube(TWTs), Microwave cross field Tubes(M Type), Magnetron

UNIT –introduction to transmission line, line equations and solution, reflection coefficient and trasmission equation, standing and standing wave ratio, line impedence and admittance, smith chart

UNIT –IV: wave guides (rectangular only), microwave hybrid circuit (waveguide Tee, magic Tee, waveguide corner, bends and Twists), directional couplers, circulators, Isolators, microstrip lines, parrallel strip lines, microstrip resonator and dielectric resonator

BOOKS & REFERENCES:

1. Microwave Engineering – D. M. Pozar, Wiley Publication
2. Microwave Engineering – R. E. Collin, McGraw Hill Publication.
3. Microwave Devices And Circuits by S.Y.Lio,PHI
4. Introduction of Microwave theory and Measurements by L.A.Lance,TMH

PAPER-III: ELE 303: IC TECHNOLOGY AND VLSI DESIGN

UNIT-I: Material purification. Epitaxial growth: LPE, VPE, MBE. Clean room specifications and requirements, Vacuum technology, sputtering, oxidation, growth mechanism and kinetics (thin and ultrathin oxides), oxidation techniques, redistribution of dopants at the interface and oxidation induced defects.

UNIT –II: Diffusion: Fick's law, diffusion mechanism, measurement techinques, diffusion in SiO_2.
Ion Implantation: systems and dose control, ion range, ion stopping, knock on ranges, metallization choices.

UNIT –III: Etching: dry etching, pattern transfer, plasma etching, sputter etching, control of etch rate and selectivity, control of edge profile. Process simulation and process integration, Lithography: optical, electron beam, ion beam, X-ray lithography, lift off, dip pen. Pattern generation, Fabrication of few devices like MMIC, laser diode etc.

UNIT-IV: Process control methods:Yield and reliability,causes of IC failure,VLSI process integration,NMOS IC technology,CMOS IC technology,Bipolar IC technology

BOOKS & REFERENCES:

1. VLSI Design by K.Lal Kishore etal, I.K.International Publishing House
2. VLSI DESIGN –S.M. Sze
3. VLSI TECHNOLOGY- Gandhi

PAPER-IV: ELE 304: INTIGRATED AND DIGITAL ELECTRONICS

UNIT-I: Operational Amplifiers: Introduction to Operational amplifier, Basic parameters, Inverting and Non-inverting amplifier, Applicability of Op-Amp in Analog computation: Solution of simultaneous and differential equation, Op-Amp as voltage follower, Adder, Subtractor, Integrator, Differentiator, logarithmic amplifier, Antilog amplifier, Analog multiplier & Divider circuit, RMS circuit.

UNIT-II: Active filters(low pass & high pass of 1^{st} & 2^{nd} order), Comparator, Mutivibrator, Schmitt trigger, Sample and hold circuit, triangular wave generator, Voltage Controlled Oscillator, Phase locked loop(PLL) and its Application, A/D and D/A converter circits, 555 Timer..

UNIT-III: Arithmetic Logic Operations And Circuits: Binary addition & subtraction, Half adder, Full adder, Half Subtracter, Full Subtracter, Controlled Inverter and Adder-Subtracter, Data processing circuits: Multiplexers, Demultiplexers, Encoder and Decoder (1 of 16 Decoder, BCD Decoder and LED Decoder).

UNIT-IV: Flip-flop: R-S, D, T, J-K and J-K Master slave flip-flops. Asynchronous, Synchronous and Mod counters. Serial, parallel shift registers and counters.

References:

1. Integrated Electronics by – Millman & Halkias
2. OPAMP and Linear Integrated Circuits By- R.A.Gayakwad
3. Linear Integrated Circuits By- Choudhary and Jain
4. Op. Amp and Linear Integrated circuit by Coughlin and Driscoll.
5. Digital Principle & Application By-Malvino Leach
6. Modern Digital Electronics By- R.P.Jain
7. Digital Electronics By Floyd
8. Digital Electronics By Goathmann
9. Digital Electronics By Tocci

FINALYEAR-SEMESTER IV

PAPER-I: ELE 401: DIGITAL SIGNAL PROCESSING

UNIT-I: Fundamentals of discrete time system: Basic definitions, important sequence, Linear and time invariant systems, impulse response, shifting, convolution, stability, Linear constant coefficients difference equations, FIR, IIR systems, Illustrations of the above concepts using MATLAB, Frequency domain analysis:

UNIT-II: Fourier transform of sequences, properties, Inverse F.T., sampling of continues time signal, Nyquist rate and aliasing problem, interpolation formula, frequency response of rectangular window, recovery of analog signal.

UNIT-III: Discrete Fourier Transform: DFT and its computation, properties, circular and linear convolution, FFT, Time and frequency dissemination, IDFT, Interpretation of DFT results, DFT-FT relationship.

UNIT-IV:Z-transform :Z-transform, properties, calculation of IZT, Application to the solution of difference equations, System function of a digital filter, combination of filter sections, **I**mplementation of digital filter using system function. Design of digital filters.

Reference Books:

1. Fundamentals of Digital Signal Processing – B.C, Ludeman, Harper & Row Publications.
2. Introduction to Digital Signal Processing- Roman Kuc, MGH
3. Introduction of Digital Signal Processing – J. G. Prokis, D.G. Manolakis
4. Digital Signal Processing – A.V. Oppenhiem, R.W. Schafer, Prentice Hall.
5. Theory and applications of digital Signal Processing- R.L. Rabiner, B. Gold, Prentice Hall of India.
6. Introduction of Digital Signal Processing – J. R. Johnson, Prentice Hall of India.

PAPER-II: ELE 402: RADAR, TV AND SATELLITE COMMUNICATION

UNIT I: Radar Performance factors; Pulsed System – Basic pulsed radar system, antennas & scanning, display methods; MTI Radar; Radar Beacons; CW Doppler Radar, Frequency modulated CW Radar.

UNIT II: Basic block diagram of B/W TV transmitter and receiever, Fundamentals, Scanning, and Interlaced scanning, Kell factor, Aspect ratio blanking and syncronising pulse, composite vedio signal

UNIT III : camera Pickup devices, image orthicon, vidicon and plumbicon tubes, Color television, signals, fundamental of colours, chroaticity, diagram, colour TV signals, NTSC and PAL transmission system

UNIT-IV: Satellite orbital mechanism, positioning of satellite w.r.t. earth**,** look angle determination(elevation and azimuth calculation), satellite link design(uplink and downlink), system noise temperature and G/T Ratio, noise power budget, free path space losses, satellite parameter and cofiguration

BOOKS & REFERENCES:

1. Electronic Communication Systems – George Kennedy
2. Electronic Communications – R. E. Schoenback
3. Satellite Communication-D.C. Aggrawal
4. MonoChrome and Colour Television- R.R. Gulati

PAPER-III: ELE 403: MICROPROCESSOR AND MICROCONTROLLER

UNIT I: Hardware Architecture of 8085, pinout, data bus address bus and control bus, tristate switches, latching of address bus, memory mapping and organization, register organization, timing diagram of different cycles

UNIT II: assembly language programming, Instruction format and addressing modes, Assembly language format, Data transfer, data manipulation & control instructions, stacks and subroutines,

UNIT III: study of general purpose peripheral interfacing ICs 8155, 8255, 8253 and 8279, Direct memory addressing, DMA controller

UNIT IV: architecture of 8086, type of addressing modes 8086, segmented memory cycles, read/write cycle in min/max mode. Reset operation, wait state, Halt state, Hold state, Lock operation and interrupt processing. Addressing modes and their features, Introduction to 8051 microcontroller, architecture, configuration, I/O port Structure, registers, memory organization

BOOKS & REFERENCES:

1. Microprocessor Architecture, Programming and Applications – R. S. Gaonkar
2. Microprocessor and Digital Systems – D. Hall
3. Microprocessor – S. I. Ahson
4. The 8051 Microcontroller architecture, programming and application by K. J. Ayala.

PAPER-IV: ELE 404: OPTO ELECTRONICS AND OPTICAL COMMUNICATION

UNIT I: Review of P-N jn-characteristics – semiconductor-hetero junction, LEDs (spontaneous emission, LED structure-surface emitting, Edge emitting-Injection efficiency, recombination efficiency, LED characteristics, spectral response, modulation, Band width, Laser diodes, Basic principle, condition for gain-Laser action-population inversion-stimulated emission, Injection Laser diode, structure, temperature effects, modulation, comparison between LED and ILDs.

UNIT II: Optical detectors-optical detector principle, absorption coefficient, detector, characteristics, Quantum efficiency, responsivity, response time-bias voltage, Noise in detectors P-N junction-photo diode, characteristics, P-I-N-photo diode, response, Avalanche photo diode (APD) multiplication process-B,W-Noise photo transistor.

UNIT III: Optical Fibre, structure, advantages, Types-propagation-wave equation, phase and group velocity, transmission characteristics, attenuation-absorption, scattering losses-dispersion, fibre bend losses, source coupling, splices and connectors-wave length division multiplexing.

UNIT IV: Optical fibre system, system design consideration, power budget, line coding, system rise time, maximum bit rate, cannel width, electro-optic effect and applications, acousto-optic effect and applications, nonlinear effect and applications

Books Recommended

1. Optical Communication- John M. Senior
2. Optical Communication –Gerd Keiser
3. Optical communication and Systems- Pallies

Ordinance relating to newly adopted semester system in M.Sc. course in Electronics & Electronics, Faculty of Science

Ordinances

A candidate who has passed B. SC. with Physics and/or Electronics is as a subject up to IIIrd year and Mathematics as a subject at least up to second year and having minimum 50% marks in aggregate from a recognized university is eligible for admission.
Admission will be made on merit of entrance test/merit of qualifying exam.

The courses of M.Sc. Electronics degree shall consist of two academic sessions and each session shall consist of two semesters.

A candidate enrolled for M.Sc. Electronics course shall be admitted to semester examination after completing a regular course of study for at least 14 weeks in each semester.

A candidate successful at all four M.Sc. Electronics semester examinations as specified in the regulation will be awarded M.Sc. degree in Electronics.

Regulations

1- The examination for semester system in M.Sc. course in Electronics /Electronics shall be by means of theory papers and practical as specified in the examination scheme which consist of

(a) Four theory papers, practical examination in each of the first and third semesters.

(b) Four theory papers, practical examinations, seminars and project Viva in second and fourth semesters.

2- The name of the candidates successful in the semester system in M.Sc. course in Electronics examination shall be arranged in the following classes.

(a) First class to those who secure 60% or more marks in aggregate.

(b) Second class to those who secure 45% or more marks in aggregate.

3- The pass marks in each semester shall be

(a) 30% marks in each theory papers subject to 40% marks in the total of theory.

(b) 40% marks impractical examinations.

Ordinance Relating to Second Examination in newly adopted semester system in M.Sc. course in Electronics & Electronics, Faculty of Science

1- A candidate taking the main examination of newly adopted semester system in M.Sc. course in Electronics & Electronics Ist, IInd, IIIrd & IVth semester will be eligible to appear in the second examination to be clubbed with respective main examination of next consecutive year.

2- An examinee shall be allowed in the second examinations only under the following circumstances

(a) It the examinee has scored not less than 30% marks in each theory paper and not less than 40% marks in total of theory but has failed in practical on has been unable to appear in practical examination the examinee may appear in second examination in practical, No improvement is allowed in practical examination.

(b) If, in an academic session, an examinee has scored not less than 40% marks in total of all theory and in practical in each semester and has scored not less than 40% marks in aggregate in each semester but has failed to score 30% or more marks in only one or two theory papers, the examinee may appear in second examination in any two of these theory papers only in one academic session.

(c) If an examinee has secured the pass marks or more in any main semester examination but desires to improve his marks, the examinee may appear in second examination in only one theory paper of his/her choice.

(d) Provided further that a candidate shall not be allowed to appear in more than two theory papers in second examinations in an academic session.

3- A candidate for any of the second examination listed above shall apply not less than 15 days before the latest for the commencement of the respective examination to be held in next consecutive year/batch.

4- The candidate has to surrender his/her original marks sheet relating to the corresponding semester examination to the controller of examination. He/She shall be eligible to take second examination only when the original mark sheet has been surrendered.

5- A candidate opting for the second examination shall be entitled to appear in the respective main examination of next consecutive year only.

6- The students who have failed are not eligible to appear in the second examination of the semester may appear as ex-student in the main examination in next session.

7- The number of attempts in examination will be subject to university ordinance and regulation.