

M.D.UNIVERSITY, ROHTAK

**SYLLABUS OF APPLIED ELECTRONICS &
INSTRUMENTATION ENGG.**

4th SEMESTER

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING

HUM – 202-E FUNDAMENTALS OF MANAGEMENT
L T P
3 1 -

Class Work : 50 Marks
Theory: 100 Marks
Total: 150 Marks
Duration of Exam.: 3 Hours

UNIT I

Meaning of management; Definitions of Management; Characteristics of management; Management Versus Administration; Management-Art-Science and Profession; Importance of Management; Development of Management Thoughts; Principles of Management; The Management Functions; Inter-relationship of Managerial functions.

UNIT II

Nature and Significance of staffing; Personnel Management and Functions of Personnel Management; Manpower planning; Process of manpower planning; Recruitment, Selection, Promotion – Seniority Versus Merit Training – objectives and types of training.

UNIT III

Production Management; Definition, Objectives, Functions and Scope. Production Planning and Control; its significance, stages in production planning and control. Brief introduction to the concepts of material management inventory control, its importance and various methods.

UNIT IV

Marketing Management – Definition of marketing, Marketing concept, objectives & functions of marketing, Marketing Research – Meaning; Definition; objectives, Importance; Limitations: Process. Advertising – meaning of advertising, objectives, functions, criticism.

UNIT V

Introduction of Financial Management, Objectives of Financial Management, Functions and Importance of Financial Management, Brief Introduction to the concept of capital structure and various sources of finance.

BOOKS RECOMMENDED

TEXT BOOKS

1. Principles and Practices of Management – R.S. Gupta, B.D.Sharma, N.S. Bhalla (Kalyani Publishers)
2. Organisation and Management – R.D. Aggarwal (Tata Mc Graw Hill)

REFERENCE BOOKS

1. Principles & Practices of Management - L.M. Prasad (Sultan Chand & Sons)

2. Management – Harold, Koontz and Cyrilo Donell (Mc.Graw Hill)
3. Marketing Management – S.A. Sherlikar (Himalya Publishing House, Bombay)
4. Financial Management – I.M. Pandey (Vikas Publishing House, New Delhi)
5. Management – James A.F. Stoner & R. Edward Freeman, Prentice Hall of India.

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

NUMERICAL METHODS

MATH - 202-E (Common for EE, EL, CHE, EI, IC & ELECTIVE FOR CSE, IT IN 8TH
SEM)

L T P

3 1 -

Class Work: 50 Marks

Theory: 100 Marks

Total: 150 Marks

Duration of exam.: 3 Hours

Part – A

Interpolation and curve fitting: Interpolation problem, Lagrangian polynomials, Divided differences, Interpolating with a cubic spline, Bezier curves and B-spline curves, Least square approximations.

Non-Linear Equations: Bisection method, Linear Interpolation methods, Newton's method, Muller's method, fixed-point method.

Simultaneous Linear Equations: Elimination method, Gauss and Gauss-Jordan method, Jacobi's method, Gauss-seidal method, Relaxation method.

Numerical Differentiation and Integration: Derivatives from differences tables, Higher Order derivatives, Extrapolation techniques, Boole's rule and Weddle's rule, Romberg's Integration.

Part –B

Numerical Solution of Ordinary Differential Equations: Taylor series method, Euler and modified Euler method, Runge-kutta methods, Milne's method, Adams-Moulton method, Power method for Eigen values by iteration.

Numerical Solution of Partial Differential Equations: Finite difference approximations of partial derivatives, solution of Laplace equation (Standards 5-point formula only), one-dimensional heat equation (Schmidt method, Crank-Nicholson method, Dufort and Frankel method) and wave equation.

TEXT BOOKS

1. Applied Numerical Analysis : Curtis F. Gerald and Patrick G. Wheatley-Pearson, . Education Ltd.
2. Numerical Method : E. Balagurusamy T.M.H.

REFERENCE BOOKS

1. Numerical Methods for Scientific and Engg. Computations: M.K. Jain, R.K. Iyenger and R.K. Jain-Wiley Eastern Ltd.
2. Introductory Methods of Numerical Analysis S. S. Sastry, P.H.I.
3. Numerical Methods in Engg. & Science : B.S. Grewal

Note: Examiner will set eight questions, taking four from Part-A and four taking atleast two from Part-B. Students will be required to attempt five questions taking atleast two from each part.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

ANALOG ELECTRONICS

EE – 202-E

L T P

3 1 0

Class Work: 50 Marks
Theory: 100 Marks
Total : 150 Marks
Duration of exam.: 3 Hours

UNIT I

SEMI CONDUCTOR DIODE

P-N junction and its V-I Characteristics; P-N junction as a rectifier; Switching characteristics of Diode.

UNIT 2

DIODE CIRCUITS

Diode as a circuit element; load-line concept; half-wave and full wave rectifiers; clipping circuits, clamping Circuits; filter circuits, peak-to-peak detector and voltage multiplier circuits.

UNIT 3

TRANSISTOR AT LOW FREQUENCES

Bipolar junction transistor; Operation, characteristics; Ebers-moll model of transistor; hybrid model, h-parameters (CE, CB, CC Configurations); Analysis of a transistor amplifier circuits using h-parameters, emitter

UNIT 4

TRANSISTOR BIASING

Operating point; Bias stability; Collector to base bias; Self-bias; Emitter bias; Bias compensation; Thermistor & sensistor compensation.

UNIT 5

TRANSISTOR AT HIGH FREQUENCES

Hybrid P model; Common Emitter short circuit current gain; Frequency Response, alpha, cut-off frequency; Gain bandwidth product; Emitter follower at high frequencies.

UNIT 6

FIELD EFFECT TRANSISTORS

Junction Field Effect Transistor; Pinch Off Voltage; Volt-Ampere characteristics; Small Signal Model. MOSFETS, Enhancement & Depletion mode, V-MOSFET; Common source amplifier; source follower, Biasing of FET; Applications of FET as a voltage variable resistor (V V R)

UNIT 7

REGULATED POWER SUPPLIES

Series and Shunt Voltage Regulators; Power Supply parameters: Three Terminal IC regulators; Switched Mode Power Supplies.

TEXT BOOKS

1. Integrated Electronics : Millman & Halkias; Mc Graw Hill
2. Electronic circuit analysis and design (Second edition): D.A. Neamen, Ttat Mc Graw Hill.
3. Electronic Devices & Circuits Boylestad & Nashelsky : Pearson

NOTE: Eight questions are to be set in all by the examiner taking atleast one question from each unit. Students will have to attempt five questions in all.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

DIGITAL ELECTRONICS

EE – 204-E

L T P

3 1 0

Class Work : 50 Marks

Theory : 100 Marks

Total : 150 Marks

Duration of exam: 3 Hours

UNIT I

FUNDAMENTALS OF DIGITAL TECHNIQUES

Digital Signal logic gates; AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR; Boolean algebra. Review of Number System; Binary codes; BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

UNIT 2

COMBINATIONAL DESIGN USING GATES

Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

UNIT 3

COMBINATIONAL DESIGN USING MSI DEVICES

Multiplexers and De-multiplexers; Their use as logic elements; Decoders, Adders/Subtractors; BCD arithmetic circuits, Encoders, Decoders / Drivers for display devices.

UNIT 4

SEQUENTIAL CIRCUITS

Flip-Flops; S-R, J-K, T; Master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

UNIT 5

DIGITAL LOGIC FAMILIES

Switching mode operation of p-n junction; Bipolar and MOS Devices, Bipolar logic families, RTL, TL, DCTL, HTL, TTL, ECL, MOS and CMOS logic families. Tri-state logic, Interfacing of CMOS and TTL families.

UNIT 6

A/D AND D/A CONVERTERS

Sample and hold circuit, weighted resistors and R-2 ladder D/A Converters, specifications for D/A converters. A/D converters " Quantization, parallel – comparator, successive approximation, counting type, dual-slope ADC specifications of ADVs.

UNIT 7

PROGRAMMABLE LOGIC DEVICES

ROM, PLA, PAL, FPGA and CPLDs.

TEXT BOOK

1. Modern Digital Electronics (Edition III) : R.P. Jain; Tata Mc Graw Hill

REFERENCE BOOKS

1. Digital Integrated Electronics: Taub & Schilling; Mc Graw Hill
2. Digital Principles and Applications : Malvino & Leach; Mc Graw Hill.
3. Digital Design: Morris Mano; Prentice Hall India.

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

ELECTROMAGNETIC THEORY

EE – 208-E

L T P

3 1 0

Class Work : 50 Marks

Theory: 100 Marks

Total: 150 Marks

Duration of exam.: 3 Hours

UNIT 1

STATIC ELECTRIC FIELDS

Coulomb's Law, Gauss's Law, potential function, field due to a continuous distribution of charge, equi-potential surfaces, Gauss's Theorem, Poisson's equation, Laplace's equation, method of electrical images, capacitance, electro-static energy, boundary conditions, the electro-static uniqueness theorem for field of a charge distribution, Dirac-Delta representation for a point charge and an infinitesimal dipole.

UNIT 2

STEADY MAGNETIC FIELDS

Faraday Induction law, Ampere's Work law in the differential vector form, Ampere's law for a current element, magnetic field due to volume distribution of current and the Dirac-Delta function. Biot-Savart's Law, magnetic vector potential, vector potential (Alternative derivation) far field of a current distribution, equation of continuity.

UNIT 3

TIME VARYING FIELDS

Equation of continuity for time varying fields, inconsistency of Ampere's law, Maxwell's field equations and their interpretation, solution for free space conditions, electromagnetic waves in a homogeneous medium, propagation of uniform plane-wave, relation between E & H in a uniform plane-wave, wave equations for conducting medium, Maxwell's equations using phasor notation, wave propagation in a conducting medium, conductors, dielectrics, wave propagation in good conductor and good dielectric, depth of penetration, polarization, linear, circular and elliptical.

UNIT 4

REFLECTION AND REFRACTION OF EM WAVES

Reflection and a refraction of plane waves at the surface of a perfect conductor & perfect dielectric (both normal Reflection and refraction of plane waves at the surfaces of a conductive medium, surface impedance, transmission-line analogy, Poynting theorem, interpretation of $E \times H$, power loss in a plane conductor.

UNIT 5: TRANSMISSION LINE THEORY

Transmission line as a distributed circuit, transmission line equation, traveling, standing waves, characteristic impedance, input impedance of terminated line, reflection coefficient, VSWR, Smith's chart and its applications.

TEXT BOOK

1. Electro-magnetic Waves and Radiating System, Jordan & Balmain, PHI.

REFERENCE BOOKS

1. Engineering Electromagnetics : Hayt. TMII
2. Electro-Magnetics: Krauss JDF, Mc Graw Hill

NOTE: 8 questions are to be set atleast one from each unit. Students have to attempt any five questions.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

ELECTRICAL MEASUREMENT AND MEASURING INSTRUMENTS

EE – 210-E

L T P

3 1 0

Class Work: 50 Marks

Theory: 100 Marks

Total: 150 Marks

Duration of exam.: 3 Hours

UNIT 1

UNITS STANDARDS AND ERRORS

SI units. Absolute standards (International, Primary Secondary and Working Standards), True Value, Error (Gross, Systematic and Random); Static Characteristic of Instruments (Accuracy, Precision, Sensitivity, Resolution and threshold).

UNIT 2

MEASURING SYSTEM FUNDAMENTALS

Classification of Instruments (Based upon mode of measurement); Absolute and Secondary Instruments, Based upon Principle of Operation, Based upon function – Indicating, Recording and Integrating Instruments); Generalized Instrument (Block diagram and description of various blocks). The three forces in an Electromechanical indicating instrument (Deflecting controlling, deflecting and damping and their suitability for bearing supports); Pivot-less supports (Simple suspension and taut band suspension, scale, information, Instrument cases (Covers)).

UNIT 3

MEASURING INSTRUMENTS

Construction, Operating principle, Torque equation, Shape of scale, use as Ammeter and Voltmeter (Extension of Range); Use on AC/DC or both; Advantages and disadvantages; Errors (Both on A/C attraction & repulsion types). Hot wire type and Induction type, Electrostatic type Instruments.

UNIT 4

WATTMETERS & ENERGY METERS

Construction, Operating principle, Torque equation, Shape of scale, Advantages & Disadvantages of Electrodynamics and Induction type Wattmeters; and single-phase induction type Energy meter; Compensation and creep in energy meter.

UNIT 5

POWER FACTOR & FREQUENCY METERS

Construction, Operation, principle, Torque equation, Advantages & disadvantages of Single-phase power factor meters (Electro-dynamic and Moving Iron types) and Frequency meters (Electrical Resonance Type, Ferro-dynamic and Electro-dynamic types).

UNIT 6

LOW AND HIGH RESISTANCE MEASUREMENTS

Limitations of Whetstone bridge; Kelvin's double bridge method; Difficulties in high resistance measurements; Measurement of high resistance by direct deflection; Loss of charge method; Meg-ohm bridge and Megger methods.

UNIT 7

A.C. BRIDGES

General Balance Equation; Circuit diagram; Phasor diagram and Advantages as well as Disadvantages and Applications of Maxwell's inductance; Maxwells Inducance-Capacitance bridge; Hays, Anderson, Ownens; De-Sauty's Schering and Weins bridges; Shielding and earthing.

TEXT BOOK

A Course in Electrical and Electronic Measurement & Instrumentation: A .K. Sawhney, Dhanpat Rai & Sons

REFERENCE BOOKS

1. Electrical Measurements: E. D. Golding
2. Electronic & Electrical Measurement & Instrumentation: J.B. Gupta, Kataria & Sons
3. Electronic Instrumentation & Measurement Technique: W.D. Cooper & A.D. Helfrict.
4. Measuring Systems E. O. DoebIm, Tata Mc Graw Hill.

NOTE: Eight questions are to be set taking atleast one question should be set from each unit. Five out of eight questions are to be attempted.

212-E ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS LAB

L T P
0 0 2

Class Work	: 25
Exam	: 25
Total	: 50
Duration of Exam	: 3 hrs

LIST OF EXPERIMENTS :

1. To identify the meters from the given lot.
2. To convert & calibrate a D' Arsonnal type galvanometer into a voltmeter & an ammeter.
3. To calibrate an energy meter with the help of a standard wattmeter & a stop watch.
4. To measure power & p.f. by 3-ammeter method.
5. To measure power & p.f. by 3-voltmeter method.
6. To measure power & p.f. in 3-phase circuit by 2-wattmeter method.
7. To measure capacitance by De Sauty's bridge.
8. To measure inductance by maxwell's bridge.
9. To measure frequency by Wien's bridge.
10. To measure the power with the help of C.T & P.T.
11. To measure magnitude & phase angle of a voltage by rectangular type potentiometer.
12. To measure magnitude & phase angle of a voltage by polar type potentiometer.
13. To measure low resistance by Kelvin's double bridge.
14. To measure high resistance by loss of charge method.

Note: At least 7 experiments should be performed from above list. Remaining 3 experiments may either be performed from above list or designed & set by concerned institution as per scope of syllabus.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

ANALOG ELECTRONICS LAB

EE – 222-E

L T P

0 0 2

Class Work : 25 Marks

Exam: 25 Marks

Total: 50 Marks

Duration of exam: 3 Hours

LIST OF EXPERIMENTS

1. Study of Half wave & full wave rectifiers.
2. Study of power supply filters.
3. Study of Diode as clipper & clamper.
4. Study of Zener diode as a voltage regulator.
5. Study of CE amplifier for voltage, current & Power gains and input, output impedances.
6. Study of CC amplifier as a buffer.
7. To study the frequency response of RC coupled amplifier.
8. Study of 3-terminal IC regulator.
9. Study of transistor as a constant current source in CE configuration.
10. Study of FET common source amplifier.
11. Study of FET common Drain amplifier.
12. Graphical determination of small signal hybrid parameters of bipolar junction transistor.
13. Study & design of a DC voltage doublers.

NOTE: AT least ten experiments are to be performed; atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

MANAV RACHNA COLLEGE OF ENGINEERING, FARIDABAD

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

DIGITAL ELECTRONICS LAB

EE – 224 -E

L T P

0 0 2

Class Work: 25 Marks

Exam : 25 Marks

Total : 50 Marks

Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & De-multiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, t & d type flip flops.
6. To verify the operation of
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit-shift-register and verify its operation. Verify the operation of a ring counter and a Johnson counter.

NOTE: At least ten experiments are to be performed, atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS LAB

EE-224 -E

L T P

0 0 2

Class Work : 25 Marks

Exam: 25 Marks

Total: 50 Marks

Duration of Exam.: 3 Hours

LIST OF EXPERIMENTS

1. To identify the meters from the given lot.
2. To convert and calibrate a D' Arsonnal type galvanometer into a voltmeter and an ammeter.
3. To calibrate an energy meter with the help of a standard wattmeter and a stop watch.
4. To measure power and power factor by three voltmeter method.
5. To measure power and power factor by three ammeter method
6. To measure power and power factor in three phase circuit by two wattmeter method.
7. To measure capacitance by De Sauty's bridge.
8. To measure inductance by maxwell's bridge.
9. To measure frequency by Wien's bridge.
10. To measure the power with the help of C.T. and P.T.
11. To measure magnitude and phase angle of a voltage by rectangular type potentiometer.
12. To measure magnitude and phase angle of a voltage by polar type potentiometer.
13. To measure low resistance by Kelvin's double bridge.
14. To measure high resistance by loss of charge method.

NOTE: At least ten experiments are to performed, out of which at least seven experiments should be performed from list. Remaining three experiments may either be performed from the above list or designed & set by the con institution as per the scope of the syllabus.

SYLLABUS FOR 4TH SEMESTER FOR APPLIED ELECTRONICS &
INSTRUMENTATION ENGINEERING

NUMERICAL METHODS LAB.

(COMMON FOR EE, EL, CHE, EI)

MATHS-204-E

L T P
0 0 2

Class Work: 25 Marks
Exam: 25 Marks
Total: 50 Marks
Duration of Exam : 3 Hours

WRITE DOWN AND EXECUTE THE FOLLOWING PROGRAMS USING C/C++/MATLAB.

1. To find the roots of non-linear equation using Bisection method.
2. To find the roots of non-linear equation using Newton's method.
3. Curve fitting by least – square approximation.
4. To solve the system of linear equations using Gauss-Elimination method.
5. To solve the system of linear equations using Gauss- Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jorden method.
7. To integrate numerically using Trapezoidal rule.
8. To integrate numerically using Simpson's rules.
9. To find the largest eigen value of a matrix by power-method.
10. To find numerical solution of ordinary differential equations by Euler's method.
11. To find numerical solution of ordinary differential equations by Runge-Kutta method
12. To find numerical solution of ordinary differential equations by Milne's method.
13. To find the numerical solution of Laplace equation
14. To find numerical solution of wave equation.
15. To find numerical solution of heat equation.

BOOK SUGGESTED:

1. Applied Numerical Analysis by Curtis F. Gerald and Patrick G.

