

ET301 ENGINEERING MATHEMATICS-III

Teaching Scheme: 04 L TOTAL 04 Credits : 04

Marking scheme: 15CT1 + 15CT2 + 10TA + 60 ESE

Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Linear Differential Equations with constant coefficients:

General solution to L.D.E. of n^{th} order with constant coefficients, rules for finding C.F., General method for finding P.I., P.I. of some standard functions, Method of Variation of Parameters, Cauchy's and Legendre's L.D.E., simultaneous linear differential equations . Applications of L.D.E.: Electrical Circuits, Kirchoff's Law, LCR Circuits, Coupled Electrical Circuits.

Partial Diff. Equations: Definition, formation of P.D.E., complete solution of PDE, Linear and non-linear PDE of types (i) $f(p, q)=0$, (ii) $f(p, q, z)=0$, (iii) $f(p, q, x, y)=0$, (iv) $f(p, q, x, y, z)=0$ ie Lagrange's form $Pp+Qq=R$ and Clairaut's form $z = px + qy + f(p, q)$, (v)Equations reducible to above forms. Complete solution of PDE of first and second order by method of separation of variables.

Laplace Transform: Definition, standard formulae and properties of LT., Laplace transform of unit step and periodic functions. Laplace Transform of unit impulse function., Inverse Laplace Transform, Convolution Property, Application of LT to solve LDE with constant coefficients.

Vector Calculus: Scalar and vector point functions, Differentiation of a vector function, Tangent and normal components of velocity and acceleration, orthogonal curves, Operator delta, Gradient of scalar point function & their physical meaning . Divergence and Curl of vector point function & their physical meaning. vector identities, solenoidal and conservative fields. Line integral, work done by force.

Functions of complex variables: Analytic function, C-R equations (Cartesian & polar), Harmonic function, Milne Thompson method for finding analytic function, Conformal mappings, Bilinear transformation.

Text Books :

- 1) Text book of applied Mathematics by P.N.Wartikar and J.N.Wartikar, Pune vidyarthi griha, Pune 2001.
- 2) Higher Engineering Mathematics by B.S.Grewal, Khanna publication, 6th edition, New Delhi, 1976.

Reference Books:

- 1) Advanced Engineering Mathematics by Kreyzig, John Wiley & sons 9th edition 1995.
- 2) Advanced Engineering Mathematics by John bird 5th edition Elsevier publication 2007.
- 3) Higher Engineering mathematics by C.R.Wiley, 8th edition John Wiley and sons 1999.

ET302 COMPONENT DEVICES AND TECHNOLOGY

Teaching Scheme: 04L Total: 04 Credit: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Devices and components: Resistors, capacitors, inductors, transformers, Switches and relays: types, construction, specifications, applications and testing. Fuses, cables and connectors: types, construction, and specifications, applications and testing. Heat sinks, inductor and transformer types, design.

Crystal growth technique: Structure and properties of Silicon (Si) Germanium (Ge) and Gallium Arsenide (GaAs), preparation, purification by zone refining and single crystal growth by Czochralski method for Si, Ge and GaAs, cutting of crystal, cementing of slices and ingots, lapping and polishing.

Measurements and etching: Resistivity measurement by two probes, four probe method, determination of conduction type by Hall effect.

Etching types: Electrolytic etching and etchants for Si and Ge, photoengraving

Formation of p-n junction: Alloying, diffusion, epitaxy and ion implantation, significance and formation of ohmic contact by welding (electric and ultrasonic welding) and thermo compression bonding, protection of p-n junction by oxidation and desiccants.

Planar technology for p-n junction diode and transistor: Hermetic encapsulation of devices, fabrication of optical fiber and splicing, properties of monolithic integrated components, monolithic integrated diodes, resistors, capacitors, transistors and Field Effect Transistors(FETs), introduction to various technologies Small Scale Integration(SSI),Medium Scale Integration(MSI), Large Scale Integration(LSI),Very Large Scale Integration(VLSI),Ultra Large Scale Integration(ULSI).

Text Book

1. Modern Electronic Equipment, (1st edition, 1999), by R.S. Khandpur, Tata Mc- Graw Hill

Reference Books

1. Electrical Safety Handbook (3rd edition, 2005) by J. Cadick, M. Capelli-Schellpfeffer, D. Neitzel, Mc-Graw Hill Professional
2. Electronics Testing and Fault Diagnosis (2nd edition, 1989) by G. C. Loveday, Longman Scientific and Technical
3. VLSI Technology (2nd edition, 2003) by S. M. Sze, Tata Mc-Graw Hill
4. Optoelectronic, an Introduction to Materials and Devices (1st edition, 1996) by J. Singh, Prentice Hall India
5. Solid-state Electronic Devices (6th edition, 2003), by S. Banerjee, B. G. Streetman, Pearson Education

ET303 ELECTRICAL TECHNOLOGY

Teaching Scheme: 04 L Total : 04 Credit: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Measurement of resistance: Wheatstone bridge, Kelvin's double bridge, Megger.

Measurement of inductance and capacitance: Maxwell's bridge, Hay's bridge, Anderson's bridge, Schering's bridge, Loss of charge method, Carey Foster's bridge, measurement of Q factor and $\tan \delta$, measurement of active and reactive power in three phases balanced and unbalanced load, electro-dynamometer type power factor meter, construction and working principle of wattmeter, frequency meter.

D.C. motors: Electrical and mechanical characteristics, speed control methods for series, shunt and compound motor, applications. Braking: Resistance, plugging and regenerative.

Induction motors: Construction, working principle, torque equation, characteristics, speed control methods: armature voltage or frequency control, rotor control, slip power recovery scheme, applications, braking: resistance, plugging and regenerative.

Transformer: Three phase transformer connections, Scott and open delta connection, three-phase to six-phase conversion. Construction, working principle and application of pulse and ferrite core transformer. Construction, working principle and applications of tachogenerator (AC and DC), stepper motor, servomotor (AC and DC), singlephase induction motors, universal and hysteresis motor.

Text Books

1. Electrical Machines (2nd edition), by S. K. Bhattacharya, Tata Mc-Graw Hill.
2. Modern Electronic Instrumentation and Measurement Techniques (1st edition, 1990), by A. D. Helfrick, W. D. Cooper, Prentice Hall India.

Reference Books

1. Electrical Machines, Drives and Power Systems (5th edition), by T. Wildi, Pearson Education.
2. Electrical Machines (1st edition), by S. Ghosh, Pearson Education.
3. Electrical Machines (1st edition), by C. I. Hubert, Pearson Education.
4. First Course in Electrical Drives (1st edition), by S. K. Pillai, New Age International.
5. Electrical Measurements and Measuring Instruments (1st edition), by E.W. Golding, ELBS.

ET304 ELECTRONIC DEVICES AND CIRCUITS

Teaching Scheme: 04L + 1T Total: 05 Credit: 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Introduction to semiconductor theory: p-n junction diode, theory and applications as rectifiers and filters with analysis.

Theory and analysis of Bi-junction transistor (BJT): Construction, working, methods of biasing, stability and stability factor, BJT as amplifier, switch, h-parameter, r-parameter, high frequency model.

Transistor amplifier and oscillators circuits with analysis: Emitter follower, Darlington emitter follower, bootstrap emitter follower, RC coupled amplifier, transformer coupled amplifier, direct coupled amplifier, Oscillators – RC oscillators(Wein Bridge and Phase shift), LC oscillators(Hartley, Colpitt's , Clapp) and crystal oscillators.

Large signal amplifiers: Class A, B, AB and C amplifiers, calculations of power gain, efficiency, power dissipation and distortion.

Theory, construction and applications of diodes: Zener, Schottkey, tunnel, varactor, light emitting diode (LED), photodiode, positive intrinsic negative (PIN) diode, phototransistor.

Theory of field effect transistor (FET): Types, characteristics, working, parameters and biasing.

Text Books

1. Electronic Devices and Circuits (2nd edition) by J. Millman and C. Halkias, Mc-Graw Hill.
2. Electronic Devices and Circuits, (1st edition) by D. R. Cheruku and B. T. Krushna, Pearson.

Reference Books

1. Electronics Devices and Circuits Theory, (9th edition, 2007) by R. Boylestad and L. Nashelsky, Prentice Hall India.
2. Electronics Devices, (6th edition) by T. Floyd, Pearson.

ET305 INSTRUMENTATION

Teaching Scheme :04L Total :04 Credit :04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Transducer classification: Active/Passive, primary, secondary, analog / digital.

Basic signal conditioning circuits: Resistive capacitive, inductance reactance bridge, current/voltage sensitive Wheatstone bridges and generalised instrumentation system with particular examples.

Static characteristics: Accuracy, precision, sensitivity, threshold, resolution, repeatability and hysteresis.

Errors: Gross, systematic, random, limiting.

Statistical parameter: Arithmetic mean average deviation, standard deviation, probable error, Histogram, normal and Gaussian curve of errors.

Electronic instrumentation: -Analog and digital data acquisition system, analog electronic multimeter, introduction to digital voltmeter and universal counter. Stripchart and X-Y recorders, optical encoders.

Temperature sensors: LM 335, resistor temperature detector (RTD), thermistors, thermocouples, thermocouples laws and its compensation methods.

Pyrometers: Total/Partial radiation and optical pyrometers.

Strain gauges: Wire factor strain measurement and temperature compensation methods.

Displacement measurement: Using resistive, capacitive, linear variable differential transformer (LVDT) and rotary variable differential transformer (RVDT) and eddy current methods.

Pressure measurement: Elastic, inductive, piezoelectric and capacitive transducers, low pressure measurement using ionization gauge, Pirani gauge, thermocouple, vacuum gauge.

Level measurement: Using ultrasonic, capacitive, inductive, and resistive with float, gamma rays and eddy current techniques.

Flow measurement: Using ultra sonic, electro-aquatic and hot wire anemometer.

Humidity measurement: Using resistive, capacitive and crystal transducer.

Velocity measurement: Using electro-aquatic and photo detectors (both linear and angular velocity).

Cathode Ray Oscilloscope : Block diagram, operation, front panel description and application.

Text Books

1. Instrumentation Devices, by D. P. Ekman, Tata McGraw-Hill.
2. Electronic Instrumentation and Measurement Techniques (1st edition), by A. D. Helfrick and W. D. Cooper

Reference Books

1. Instrumentation: Devices and Systems (2nd edition), by C. S. Rangan, G. R. Sharma and V. S. Mani, Tata McGraw-Hill.
2. Principles of Industrial Instrumentation (2nd edition), by Patranabis, Tata McGraw-Hill.
3. Industrial Instrumentation and Control (2nd edition), by J. Singh, Tata McGraw-Hill

ET306 GENERAL PROFICIENCY I

Teaching Scheme: 02P Total : 02 Credit : 02

Evaluation Scheme: 50 Internal Total Marks: 50

After completing this course the student should be able to get proficiency in

1. Reading, Writing and Speaking Skills

Style and Structure: art of writing, Elements of prose, aspects of effective style, patterning the text, editing

the own writing, the mechanism of writing

The building blocks of good English: uses of words, improving the vocabulary, mastering grammar, the

secret of punctuation, dictionaries and how to use them,

Writing at work, home: Writing letters at work, how to write reports, writing for meeting, job application,

writing letters from home, invitation and announcement, modes of address, coping with exams, studied

techniques, essay writing and research,

The skill of good speaking: improving your voice and speech, the art of conversation, public speaking,

using visual aids, being interviewed by media, job interview, dealing with the boss, dealing with the subordinates, how to run a meeting, negotiating and selling

2. Thinking skill: How to think, critical thinking and lateral thinking.

3. Memorising and memorising skills

References

1. Orient communication in English for technical students, by Longman, TTTI Calcutta.

2. How to write and speak better, Reader's digest, Touchan Books Limited. Editor John Ellison Kahn

3. Six Hat thinking, by E. D. Bono, Penguin Books
4. English Grammar by Wren and Martin.
5. Word Power Made Easy by Norman Lewis, Goyal Saab, Goyal Publishers.

Minimum 10 experiments based on above syllabus,

1. Vocabulary building (words/week)
2. Demonstration of audio, video CDs.(LRs)
3. Reading, orating and writing paragraphs from English daily.
1. Precise writing and comprehension.
2. Enriching communication with use of idioms and phrases.
3. Learning read/write/speak by listening to learning recourses
4. Supervised one to one, one to many and many to many communication (letter, extempore, board writing, telephonic conversation, debate, elocution etc.)
5. Demonstration of Audio, Video CDs of interviews, speeches etc.
6. Audio recording of the conversations and analysing it offline.
7. Pronunciation of foreign language words commonly practiced. (French, Greek, Latin etc)
8. Six thinking hats/lateral thinking.
9. Practice of memorizing

ET307 COMPONENT DEVICES AND TECHNOLOGY LABORATORY

Teaching Scheme: 02P Total : 02 Credit : 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to carry shall cover

entire curriculum and the list is just a guideline.

List

1. Passive components (resistors, capacitors, inductors).
2. Active component (diodes and transistors).
3. Electric safety (leakage current measurement).
4. switches (mechanical and electronic).
5. Relays (low voltage).
6. Fuses, cable and connector.
7. Heat sink for electronic devices.
8. Mini project (electronic circuit fabrication).
9. Surface mount devices.

ET308 ELECTRICAL ENGINEERING LABORATORY

Teaching Scheme: 02P Total : 02 Credit : 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to carry shall cover

entire curriculum and the list is just a guideline.

List

1. Measurement of low resistance by Kelvin's double bridge.
2. Measurement of high resistance by loss of charge method.
3. Measurement of unknown capacitance by De-sauty's bridge.
4. Measurement of unknown inductance by Maxwell's inductance and capacitance bridge.
5. Speed control of D.C. shunts motor by voltage control and flux control method.

6. Rheostatic braking of D. C. shunt motor.
7. Measurement of three-phase power in balanced load by two-wattmeter method.
8. Study of Megger for measurement of (high resistance).
9. Study of single-phase induction motor.
10. Study of three-phase transformer connection (Scott and open delta).

ET309 ELECTRONIC DEVICES AND CIRCUITS LABORATORY

Teaching Scheme: 02P Total : 02 Credit : 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to be carried shall

cover entire curriculum and the list is just a guideline.

List

1. Characteristics of diode.
2. Diode as rectifier.
3. Diode rectifier with filter.
4. Characteristics of transistor
5. Transistor as amplifier and switch.
6. Transistor analysis.
7. Transistor coupled amplifier.
8. Frequency response of transistor.
9. Transistor as power amplifier.
10. Characteristics of field effect transistor.
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ET310 INSTRUMENTATION LABORATORY

Teaching Scheme: 02P Total : 02 Credit : 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to be carried shall

cover entire curriculum and the list is just a guideline.

List

1. Measurement of unknown resistance, capacitance and inductance using bridges.
2. Measurement of physical quantity (like temperature, pressure, air velocity, etc) using transducer.
3. Displacement measurement.
4. Water level measurement.
5. Water flow measurement.
6. X-Y recorder.
7. Strain measurement.
8. Ultra sonic transducer.
9. Photo detector.

ET401 ENGINEERING MATHEMATICS-IV

Teaching Scheme: 04 L TOTAL 04 Credits : 04

Marking scheme: 15CT1 + 15CT2 + 10TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Z-Transform:

Definition, standard forms and properties of Z-transform (i.e. linearity, shifting, multiplication by k and change of scale property), Z-transform of impulse and unit step function, Z-transform of derivatives and integrals, inverse Z-transform. Application of Z-transform to find the solution to difference equations of the first and second order.

Fourier transform:

Complex exponential form of Fourier series, Fourier integral, Fourier sine and cosine integrals, Fourier transform, Fourier sine and cosine transform, inverse Fourier transform.

Vector spaces:

vector spaces and subspaces, null spaces, column spaces and linear transformations, linearly independent sets, bases, coordinate systems, dimensions of vector space, change of bases ,application to difference equations. Orthogonality and least squares: Inner product, length and orthogonality, orthogonal sets, orthogonal projections, Gram-Schmidt process, least square problems, inner product spaces.

Complex integration:

Line and contour integration, singular points, expansion of functions in Taylor's and Laurent's series, Cauchy's integral theorem and integral formula, residue theorem, evaluation of real integrals using residue theorem.

Probability:

Introduction to random processes, probability distributions i.e. discrete and continuous distributions, probability density function, Binomial, Poisson, Normal distributions.

Text Books:

- 1) Text book of applied Mathematics by P.N.Wartikar and J.N.Wartikar Pune vidyarthi griha,Pune 2001.
- 2) Higher Engineering Mathematics by B.S.Grewal, khanna publication, new Delhi, 6th edition,1976.
- 3) Linear algebra and its applications by D.C.Lay 3th edition Addison Wesley, 2004.

Reference Books:

- 1) Advanced Engineering Mathematics by John bird 5th edition Elsevier publication 2007.
- 2) Advanced Engineering Mathematics by Kreyzig, 9th edition, John Wiley Publication 1995.
- 3) Linear Algebra with applications by Nicolson, Mc Graw Hill 2004.

ET402 FUNDAMENTALS OF COMMUNICATION

Teaching Scheme: 04L + 1T Total : 05 Credit : 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Basics: Signals and its type, electromagnetic frequency spectrum, basics of communication, various base bands, bandwidth of different base band.

Modulation and wave propagation :Its need and types Amplitude modulation , mathematical analysis, modulation index, frequency spectrum, power requirement of this systems, generation of AM signal, Frequency modulation (FM), mathematical analysis, modulation index, frequency spectrum, power requirement of FM, wave propagation and its different types, maximum usable frequency (MUF), critical frequency, fading, virtual height, skip distance, single and multi hop transmission, duct propagation.

Noise: Sources of noise and its types, signal to noise ratio, noise factor, noise figure, noise temperature, noise equivalent temperature.

Transmission line: Various parameters of transmission line, their relations, derivation of standing wave ratio, quarter wave transformer, stub matching, Smith chart.

Antenna: Radiation pattern, types of antenna, antenna arrays, turnstile, loop, log-periodic, UHF and microwave (only structure and principle)

Telephony: Basics of land line telephony, working of exchanges local and trunk, basics of integrated service digital network (ISDN), basics of wireless phones such as mobile, cellular, paging system, facsimile.

Text Book

1. Electronic communication systems,(4th edition,2006), by Kennedy and Davis, Tata Mc-Graw Hill.

Reference Books

1. Electronic communication,(6th edition,1990), by R. L. Shrader, Tata Mc-Graw Hill
2. Electronic communication, by L. Temes, M. Schultz , Tata Mc-Graw Hill
3. Electronic communications systems, (4th edition), by T. Wayne, Pearson
4. Electronic communications, (4th edition) by R. Dennis and J. Coolen, Prentice Hall

ET403 DIGITAL ELECTRONICS

Teaching Scheme: 04L Total : 04 Credit : 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Switching characteristics: Diode, transistor, FET, MOSFET.

Boolean algebra: Logic circuits, arithmetic circuits, and simplification of Boolean function using Boolean theorem, K-map, realization of AND- OR logics.

Error detecting and correcting codes: Weighted/non- weighted codes, alphanumeric codes, Binary Coded Decimal , Hamming codes, parity codes,biquinary codes, Cyclic Redundancy Code method.

Digital logic families: RTL, DTL, HTL, TTL, ECL, IIL, CMOS, their characteristics, fan-in, fan-out, noise immunity, Tri-stage logic, details of TTL analysis.

Sequential circuit: Flip-flop,S-R ,J-K,Master slave J-K,D type, T type excitation table of flip-flop, shift registers.

Counter: Counter I C, asynchronous and synchronous, preset able up/down counter

Semiconductor memories: RAM cell, ROM, PROM, EPROM, EEPROM, CCD Memories, introduction to CPLD and FPGA.

Arithmetical circuits : Half adder, full adder, half subtractor, full subtractor, 4-bit binary adder/subtractor, BCD adder/subtractor.

Text Book

1. Digital principles and application(6th editon, 2006), by A. P. Malvino, D. P. Leach, Tata Mc-Graw Hill

Reference Books

1. Digital electronics, (2nd edition), by W. H. Gothman, Prentice Hall India
2. Digital logic and computer design, by M. Morris, Prentice Hall India
3. Digital Principles and Design,(1st edition, 2002) by D. Givone, Tata Mc-Graw Hill
4. Modern Digital electronics,(3rd edition, 2005) by R. P. Jain., Tata Mc-Graw Hill

ET404 NETWORK ANALYSIS

Teaching Scheme : 04L Total :04 Credit : 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Terminal Element Relationships: V-I relationship for Inductance and Capacitance- Constant Flux Linkage Theorem and Constant Charge Theorem- v-i relationship for Independent Voltage and Current Sources - v-i relationship for dependent voltage and current sources- Source Functions: unit impulse, unit step, unit ramp and inter relationship, sinusoidal input ,generalized exponential input.

Basic Nodal and mesh Analysis: Introduction, Nodal analysis, the super node, mesh analysis, the super mesh, nodal vs mesh analysis, computer aided circuit analysis using Pspice

Useful circuit analysis techniques: Linearity and superposition, source transformations, Thevinin's theorem , Norton's theorem, Maximum power transfer theorem, Delta-wye transformations

Time Domain Analysis of Circuits: Linear Differential Equations for Series RC, Parallel RC, Series RL, Parallel RL, Series RLC, Parallel RLC and Coupled Circuits-Complete Solution for step/impulse/sinusoid voltage/current inputs-Natural Response-Transient Response-Time Constant-Rise and Fall times-Concept of d.c steady state and sinusoidal steady state-Frequency Response of simple circuits from steady state solution-Solution of two mesh circuits by differential equation method-Determination of initial conditions. Time domain analysis using Pspice

Transformation of a Circuit into s-domain: Transformed equivalent of inductance, capacitance and mutual inductance -Impedance and admittance in the transform domain - Node Analysis and Mesh Analysis of the transformed circuit - Nodal Admittance Matrix and Mesh Impedance Matrix in the s-domain - Solution of transformed circuits including mutually coupled circuits-Input and transfer immittance functions - Transfer functions - Impulse response and Transfer function - Poles and Zeros - Pole Zero plots, using Pspice for transform domain analysis

Sinusoidal Steady State analysis: Introduction, characteristics of sinusoids, forced response to sinusoidal functions, the complex forcing function, The phasor, phasor relationships for R L C, impedance and admittance , sinusoidal steady state analysis with phasors, pspice for sinusoidal steady state analysis.

Two Port Networks: two port networks-characterizations in terms of impedance, admittance, hybrid and transmission parameters-inter relationships among parameter sets-Reciprocity Theorem-Interconnection of Two port networks: Series, Parallel and Cascade - Network Functions-Pole Zero plots and steady state response from pole-zero plots. Use of Pspice for two port networks.

Passive Filters: Constant k and m derived LC filters – low pass, high pass, band pass, band stop filter.

Text Book

1. Network analysis, (3rd edition, 1995), by M. E. Van Valkenburg, Prentice Hall of India.

Reference Books

1. Circuits and networks, (3rd edition, 2007), by Sudhakar and M. Shyam, Tata McGraw-Hill.
2. Linear circuit analysis (11th edition), by De Carlo and Lin, Oxford University Press
3. Circuit analysis (1st edition, 1993) by T. S. K. V. Iyer, Tata McGraw-Hill
4. Engineering circuit analysis (6th edition), by W. Hayt, I. f. Jr. and J. E. Kemmerly, McGraw Hill

ET405 HUMANITIES AND ECONOMICS

Teaching Scheme :04L Total :04 Credit : 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100

Duration of ESE : 2 Hrs.30 min.

Human needs : Motivation, MASLAW's need hierarchy theory, importance of humanities to engineer, Constitution of India rights and duties

Organisation : Organization change and development, manpower planning, man power development, career management.

Sustainable development: Introduction and meaning, implication of human population growth, pollution control.

Psychology : Definition, nature, scope, hurdles, application in industries .

Behavioral science: Importance of science and technology on culture of civilization, function of family, type of family, social responsibility of business

Economics : Importance, factor of production, elasticity of demand, laws of return.

Production : Cost of production, break even analysis, cost benefit analysis,

Banking and taxations : Function of various banks, roles of bank in development, type of taxation.

Business : Prevention and control of monopoly, restrictive trade practices **Globalisation :** Economics and globalisation, foreign collaboration, joint ventures, impact of competition on small-scale industries, value added tax(VAT)

Text Book

1. Principle of Management (2nd edition), by P.C. Tripathy, P. N. Reddy, Tata McGraw-Hill.

Reference Books

1. Introduction to Microeconomics, by P.C. Ray, Macmillan.
2. Business Economics, by V. G. Mankar, Macmillan.

ET406 GENERAL PROFICIENCY II

Teaching Scheme: 02P Total :02 Credit: 02

Evaluation Scheme: 50 Internal Total Marks: 50

After completing this course the student should be able to effectively communicate

Accessing conversation control: Recognise clues and cues, problem centered and solution centered behavior, conversation through statement and request, using dynamics in conversation, importance of territory and permissions, how to win or lose in conversation using facts and opinion to diverge and converge, using visuals to improve your verbal, summarising conversation, scheduling and managing it, challenging assumption and effectiveness, giving feedback, when to be positive and negative, speeding up and slow down conversation ,key rules of conversation control ,using conversation control skills, improving the conversation control

Body Language: A frame work for understanding, territories and zone, palm gesture, hand and arm gesture, hand-to-face gesture, arm barriers, leg barriers, other popular gesture and action, eye signals, courtship gesture and signal, etc, territorial and ownership gesture, carbon copies and mirror images, body lowering and status, pointers, desks tables and seating arrangement, power plays, putting it all together.

Memorising and memorising technique

Proposal and Report writing practices (R and D, project, patent, etc)

References

1. Long man, Orient communication in English for technical students, TTTI Calcutta (for first topic)
 2. How to write and speak better, Reader's digest, Touchan Books Limited. Editor John Ellison Kahn
 3. Allan Pease, Body language, Sheldon press
- Minimum 10 experiments based on above syllabus

1. Live observation of the conversation/communication, body language.
2. Learning conversation by listening to guidelines.(with learning recourses)
3. Supervised one to one, one to many and many to many conversation can be practiced.
4. Demonstration of Audio, Video CDs of well known personalities.
5. Audio recording of the conversations and analysing it offline.
6. Video recording of the conversations and analysing it offline.
7. Talking in front of mirror in the laboratory in presence of observers like other batch mates, group leaders and/or teachers
8. Report writing.
9. Johnharry Window
10. I am okay-you are okay model.

ET407 ENGINEERING MATHEMATICS IV LABORATORY

Teaching Scheme: 02P Total: 02 Credit : 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to be carried shall

cover entire curriculum and the list is just a guideline.

List

To be conducted with the help of MATLAB/MAPPLE (engineering application).

1. Getting started with (inbuilt demonstrations and help) MatLab, Mapple and MathCAD
2. Solution of linear equations, matrix operations, differential equations, derivatives, integration using MATLAB and MAPPLE.
3. Nonlinear equation (example: Gauss Elimination, Newton Raphson, Modified Newton Raphson Secant, etc).
4. Plotting of graphs, like bar, pie, line etc with given set of data or of given equations.
5. Infinite series (example: Sine, Cosine, etc).
6. Laplace transform.
7. Fourier series and transforms.
8. Z transform.
9. Probability.
10. Statistics.

ET408 FUNDAMENTALS OF COMMUNICATION LABORATORY

Teaching Scheme: 02P Total: 02 Credit: 01

Evaluation Scheme: 25 Internal + 25 External Total Marks: 50

Minimum eight experiments shall be performed from the list given below. The experiments to be carried shall

cover entire curriculum and the list is just a guideline.

List

1. Random noise, power spectral density, signal to noise ratio, noise figure.
2. Calculating modulation index of amplitude modulated wave.
3. Frequency modulated wave.
4. Generation Double side band suppressed carrier wave.
5. Single side band wave generation.
6. Demodulator (Amplitude and frequency modulation).
7. Transmission and reception (A.M. and F.M.).

8. Transmission line (stub matching, Standing Wave ratio, etc).
9. High frequency antenna (radiation pattern, square law, etc).