

BEPT-201- Engineering Mathematics-II

Important Note :- This Syllabus is only applicable to the Students admitted in 2015-16. For the students admitted in 2016-17 and onwards, the syllabus given on Page 2 is applicable.

Unit I

Fourier Series: Introduction of Fourier series , Fourier series for Discontinuous functions, Fourier series for even and odd function, Half range series Fourier Transform: Definition and properties of Fourier transform, Sine and Cosine transform.

Unit II

Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations

Unit III

Second Order linear differential equation with variable coefficients : Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method

Unit IV

Linear and Non Linear partial differential equation of first order: Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation, charpit's method. Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients. Separation of variable method for the solution of wave and heat equations

Unit V

Vector Calculus: Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, unit normal vector and directional derivative, physical interpretation of divergence and Curl. Line integral, surface integral and volume integral, Green's, Stoke's and Gauss divergence theorem

References

- (i) Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
- (ii) Higher Engineering Mathematics by BS Grewal, Khanna Publication
- (iii) Advance Engineering Mathematics by D.G.Guffy
- (iv) Mathematics for Engineers by S.Arumungam, SCITECH Publuication
- (v) Engineering Mathematics by S S Sastri. P.H.I.

SEMESTER –II**BEPT-201- Engineering Mathematics-II**

Important Note :- This Syllabus is applicable to the Students admitted in 2016-17 and onwards. For the students admitted in 2015-16, syllabus given on Page 1 is applicable.

Unit I

Functions of complex variables : Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem , Application of Residues theorem for evaluation of real integrals

Unit II

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi , Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability : Probability Mass function, Probability density function. Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution ,Gamma Distribution ,Beta Distribution ,Testing of Hypothesis |:Students t-test, Fisher's z-test, Chi-Square Method

Reference:

- (i) Numerical Methods using Matlab by J.H.Mathews and K.D.Fink, P.H.I.
- (ii) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
- (iii) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
- (iv) Numerical Methods using Matlab by Yang,Wiley India
- (v) Pobability and Statistics by Ravichandran ,Wiley India
- (vi) Mathematical Statistics by George R., Springer

B.E. (PTDC) Electrical & Electronic Engineering

SEMESTER –II

PTEX-202- Electrical Machine-I

Unit I

Review of single phase transformer, Equivalent circuits, voltage regulation, short circuit and open circuit tests and performance evaluation, effect of saturation on magnetizing current, Ferroresonance, 3-phase transformers, constructional features, winding arrangements, cooling, conservators, breathers, buckholz relay, vector phase groups, Scott connections, Autotransformers, parallel operation and load sharing, Pulse and high frequency transformers.

Unit II

D.C. Machines: Review of constructional features. Methods of excitation, Armature windings, Power balance, Voltage and torque equations- Operation as generator - Self-excitation principles. Characteristics, Armature reaction, Commutation. Operation as a Motor - characteristics and their control. Starting, speed control including solid state controllers, Braking . Losses, Efficiency. Testing and applications of dc motors.

Unit III

Three phase Induction motor: Review of constructional details. Review of Polyphase Distributed AC Windings. Production of EMF, steady state analysis, equivalent circuit, Phasor diagram, power flow diagram and torque-speed characteristics, circle diagram.

Unit IV

Starting Methods, Power factor Control. Speed control schemes including solid state and vector control. Braking. Effect of space/time harmonics and analysis. Crawling & Cogging, Double cage & Deep bar Induction Motor Testing Losses and Efficiency, effect of unbalanced supply, Induction generators.

Unit V

Single Phase Motors: Double revolving field theory, equivalent circuit, characteristics, Performance and starting of single phase motor.

Reference Books:

1. M. G. Say, 'Alternating Current Machines', (5th Ed.) ELBS, 1986.
2. M.G.Say and E.O.Taylor "Direct Current Machines" Second Ed., ELBS, 1985.
3. V.Del Toro, "Electrical Machines & Power Systems", 1985, Prentice-Hall, Inc., Englewood Cliffs.
4. V.Del Toro, "Electromechanical Devices for Energy Conversion & Control Systems", PHI Pvt. Ltd., 1975.

Text Books:

1. Electrical Machines by Nagrath and Kothari.
2. A.C. Machines by Langsdorf.
3. Electrical Machines Dr.P.S.Bimbhra.
4. Electrical Machines- Ashfaq Hussain. Dhanpat Rai Publication.

Suggestive list of Experiments -

1. Characteristics of DC machines - motors and generators with different excitation.
2. Hopkinson's test and Fields test- loss calculations and prediction of performance characteristics.
3. Speed control of dc motors - conventional
4. Transformer Vector phase group studies. Combination for paralleling.
5. 3 to 2 phase conversion using Scott connection and perform load test.
6. Phase conversion using three single centre tapped transformers or multiwinding single phase transformers
7. No load & block rotor test on 3- Φ I.M. & determine its equivalent ckt parameters
8. load test on 3- Φ I.M.& Plot its performance, characteristics
9. Swinburn's test of D.C.motor & determine its efficiency.

B.E. (PTDC) Electrical & Electronic Engineering

SEMESTER –II

PTEX-203- Measurement & Instrumentation

Unit I

Measurement and error, Accuracy and precision, sensitivity resolution, Error & Error analysis, Effect of temperature, Stray field, Hysteresis & method of minimizing them, Loading effects, due to shunt connected and series connected instruments, Error calibration curve, Testing & calibration of instruments. Galvanometers – Theory & operation of ballistic galvanometer, D'Arsonval galvanometer, galvanometer motion & damping, Sensitivity, Flux meter, Vibration galvanometer, Spot deflection galvanometer.

Definition of analog & digital instruments, Classification of analog instruments, their operating principle, Operating force, Types of supports, Damping, Controlling.

Unit II

Different types of Ammeter & Voltmeter – PMMC, MI, Electrodynamometer, Hotwire, Electrostatic, Induction, Rectifier, Ferrodynamic & Electrothermic, Expression for control & deflection torque, their advantages, disadvantages & error. Extension of range of instruments using shunt & multiplier.

Unit III

Instrument transformers – Potential and current transformers, ratio and phase angle errors, testing of instrument transformers, Difference between CT and PT, errors and reduction of errors. Measurement of power – Power in AC and DC Circuit, Electrodynamometer type of wattmeter, Construction, theory, operation & error. Low power factor & UPF wattmeter, Double element and three element dynamometer wattmeter. Measurement of power in three phase circuit, one, two & three wattmeter method, Measurement of reactive power by single wattmeter. Measurement of power using CTs & PTs.

Unit IV

Measurement of Energy – Single phase induction type energy meter – construction & operation – driving and braking torques – errors & compensations – Testing by phantom loading and using R.S.S. meter- Three phase energy meter – Trivector meter – Maximum demand meter, Ampere hour meter.

Reference Books:

1. A.K. Sawni “Electrical Measurement & Measuring Instruments”

B.E. (PTDC) Electrical & Electronic Engineering

SEMESTER –II

BEPT-204- Engineering Physics

Unit I

Quantum Physics

Group and particle velocities & their relationship. Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit). Compton scattering. Wave function and its properties, energy and momentum operators, time dependent and time independent Schrödinger wave equation. Application of time independent Schrödinger wave equation to particle trapped in a one dimensional square potential well (derivation of energy eigen values and wave function)

Unit II

Wave Optics

Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted light), interference from a wedge shaped thin film, Newton's rings and Michelson's interferometer experiments and their applications. Diffraction at single slit, double slit and n-slits (diffraction grating). Resolving power of grating and prism. Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate.

Unit III

Nuclear Physics

Nuclear liquid drop model (semi empirical mass formula), nuclear shell model, Linear Particle accelerators: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron. GeigerMuller Counter, Motion of charged particles in crossed electric and magnetic fields. Uses of Bainbridge and Aston mass Spectrographs.

Unit IV

Solid State Physics

Qualitative discussion of Kronig Penny model (no derivation), Effective mass, Fermi-Dirac statistical distribution function, Fermi level for Intrinsic and Extrinsic Semiconductors, Zener diode, tunnel diode, photodiode, solar-cells, Hall effect. Superconductivity: Meissner effect, Type I and Type II superconductors, Di-electric polarization, Complex permittivity, dielectric losses

UNIT V

Laser and Fiber Optics

Laser: Stimulated and spontaneous processes, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristics of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd:YAG, He-Ne & Carbon dioxide Lasers with energy level diagram.. Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber (Ray theory) pulse dispersion, attenuation, losses & various uses. Applications of lasers and optical fibers.

Reference Books: -

1. Optics By Ghatak, TMH
2. Engineering Physics- V. S. Yadava, TMH
3. Optics by Brijlal and Subhraminayan.
4. Engineering physics by M.N. Avadhanulu and. S. Chand & Co.(2004)
5. Atomic and Nuclear physics by Brijlal and Subraminayan.
6. Concepts of Modern Physics- Beiser, TMH
7. Solid State Physics by Kittel ,Wiley India
8. Fundamentals of Physics-Halliday, Wiley India

List of suggestive core experiments: -

1. Biprism, Newton's Rings, Michelson's Interferometer.
2. Resolving Powers –Telescope, Microscope, and Grating.
3. G.M. Counter
4. Spectrometers-R.I., Wavelength, using prism and grating
5. Optical polarization based experiments: Brewster's angle, polarimeter etc.
6. Measurements by LASER-Directionality, Numerical aperture, Distance etc.
7. Uses of Potentiometers and Bridges (Electrical)..
8. Experiments connected with diodes and transistor.
9. Measurement of energy band gap of semiconductor.
10. To study Hall effect.
11. Solar cell.
12. To find the width of a single slit by a He-Ne Laser.
13. To determine the numerical aperture (NA) of an Optical Fibre.
14. To determine Planck's constant.
15. Other conceptual experiments related to theory syllabus.

B.E. (PTDC) Electrical & Electronic Engineering

SEMESTER –II

BEPT-205- Computer Programming-II

UNIT I

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System & Application Software. Computer Application in eBusiness, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc. Operating System: Definition, Function, Types, Management of File, Process & Memory. Introduction to MS word, MS powerpoint, MS Excel

UNIT II

Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS object oriented Programming. Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and control structures, I/O operations, Array, Functions,

UNIT III

Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, Inheritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual functions. Introduction to Data Structures.

UNIT IV

Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of Different Layers. Internetworking Concepts, Devices, TCP/IP Model. Introduction to Internet, World Wide Web, E-commerce Computer Security Basics: Introduction to viruses, worms, malware, Trojans, Spyware and Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Cyber Pornography, Email spoofing, Denial of Service (DoS), Cyber Stalking, Logic bombs, Hacking Spamming, Cyber Defamation, pharming Security measures Firewall, Computer Ethics & Good Practices, Introduction of Cyber Laws about Internet Fraud, Good Computer Security Habits,

UNIT V

Data base Management System: Introduction, File oriented approach and Database approach, Data Models, Architecture of Database System, Data independence, Data dictionary, DBA, Primary Key, Data definition language and Manipulation Languages. Cloud computing: definition, cloud infrastructure, cloud segments or service delivery models (IaaS, PaaS and SaaS), cloud deployment models/ types of cloud (public, private, community and hybrid clouds), Pros and Cons of cloud computing.

List of Experiment

01. Study and practice of Internal & External DOS commands.
02. Study and practice of Basic linux Commands – ls, cp, mv, rm, chmod, kill, ps etc.
03. Study and Practice of MS windows – Folder related operations, My-Computer, window explorer, Control Panel,
04. Creation and editing of Text files using MS- word.
05. Creation and operating of spreadsheet using MS-Excel.
06. Creation and editing power-point slides using MS- power point
07. Creation and manipulation of database table using SQL in MS-Access.
08. WAP to illustrate Arithmetic expressions
09. WAP to illustrate Arrays.
10. WAP to illustrate functions.
11. WAP to illustrate constructor & Destructor
12. WAP to illustrate Object and classes.
13. WAP to illustrate Operator overloading
14. WAP to illustrate Function overloading
15. WAP to illustrate Derived classes & Inheritance
16. WAP to insert and delete and element from the Stack
17. WAP to insert and delete and element from the Queue
18. WAP to insert and delete and element from the Linked List

Recommended Text Books: 1. Fundamentals of Computers: E Balagurusamy, TMH

2. Basic Computer Engineering: Silakari and Shukla, Wiley India

3. Fundamentals of Computers : V Rajaraman, PHI

4. Information Technology Principles and Application: Ajoy Kumar Ray & Tinku Acharya PHI.

Recommended Reference Books:

1. Introduction of Computers : Peter Norton, TMH
2. Object Oriented Programming with C++ :E.Balagurusamy, TMH
3. Object Oriented Programming in C++: Rajesh K.Shukla, Wiley India
4. Concepts in Computing: Kenneth Hoganson, Jones & Bartlett.
5. Operating Systems – Silberschatz and Galvin - Wiley India
6. Computer Networks:Andrew Tananbaum, PHI
7. Data Base Management Systems, Korth, TMH
8. Cloud Computing, Kumar, Wiley India