

Syllabus

Of

**B. Tech. Programme
2nd Semester**

In

*Engineering
For Batch 2015*

*Kashmir Institute of Technology
(Zakura Campus)*

University of Kashmir

Zakura Crossing, Srinagar 190006, J&K

Course Layout

B.Tech. (2nd Semester)

Course No	Subject	Teaching Periods per week			Credits
		Lect	Tut	Prac	
MTH-201	Engineering Mathematics-II	3	1	0	4
ELE-202	Basic Electrical Engineering	2	1	0	3
ECE-203	Basics of Electronics Engineering	2	1	0	3
CSE-204	Computer Programming	2	1	0	3
MEC-205	Engineering Mechanics	2	1	0	3
HUM-206	Professional Communication	2	1	0	3
ELE-207L	Basic Electrical Engineering- Lab	0	0	4	2
CSE-208L	Computer Programming -Lab	0	0	4	2
ECE- 209L	Electronics Engineering-Lab	0	0	4	2
	Total	13	6	12	25

Course No: MTH- 201

ENGINEERING MATHEMATICS – II

UNIT-I

Ordinary and Linear Differential Equations: Formation of ordinary differential equations, Solution of first order differential equations by separation of variables, Homogeneous equations, Exact differential equations, Equations reducible to exact form by integrating factors, Linear differential equations with constant coefficients, Cauchy's homogeneous linear equations, Legendre's linear equations

UNIT-II

Partial Differential Equations: Formulation and classification of PDE's, Solution of first order linear equations, Four standard forms of non-linear equations, Separation of variable method for solution of heat, wave and Laplace equation. **Matrices:** Rank of a matrix, Elementary transformations, Consistency and solutions of a system of linear equations by matrix methods, Eigen values & Eigen vectors, Properties, Cayley-Hamilton's theorem

UNIT-III

Probability: Basic concepts of probability, Types of probability: Marginal, joint and conditional, probability rules: Addition, Multiplication, complement; Probability tree, probability under conditions of statistical independence and dependence, Baye's Theorem. **Random Variables and Distribution:** Random variables, Probability distribution, Probability density function, Discrete and continuous distributions- Binomial, Poisson, Normal distributions, Measures of central tendency and dispersion, Sampling distribution, standard error, Central limit theorem

Text Books:

1. E. Kreyszig, "Advanced Engineering Mathematics", John Wiley.
2. R. K. Jain & S. R. K. Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House.
3. Frank Ayres, "Matrices", Mc Graw Hills.
4. Malik & Arora, "Advanced Mathematical Analysis", S. Chand & Co.

Course No: ELE-202

BASICS OF ELECTRICAL ENGINEERING

UNIT-I

Basic electric circuit terminology, Ohm's law, Nodes, Paths, Loops, Branches, Kirchhoff's current law (KCL) and Kirchhoff's voltage law (KVL), circuit parameters (Resistance, Inductance and capacitance). Series and Parallel combinations of resistance, Inductance and capacitance. Ideal and practical voltage and current sources and their transformation. Dependent voltage sources and dependent current sources. Power and energy relations, Analysis of series parallel d.c. circuits, Delta star(Y) Transformation, Loop and Nodal methods: Nodal analysis, Mesh analysis, Supernode, Supermesh.

UNIT-II

Network topology: Formation of incidence matrices, Tieset and cutset formation. Network theorems: linearity & superposition, Source transformations, Thevenin and Norton equivalent circuit analysis, Maximum power transfer, reciprocity & Millman's theorem.

UNIT-III

AC. Circuit analysis : Basic terminology and definitions: behavior of capacitors and inductors to A.C., Basic RL, RC and RLC circuits and their step response., Phasor and complex number representations, phasor relations for R, L & C, impedance, admittance parameters. Solutions of sinusoidal excited, RC circuits, Power and energy relations in A.C circuits. Concept of a 3 phase voltage, star (Y) and Delta circuits, current and voltage relations in Star and Delta Circuits,

Text Books:

1. W H Hayt J E Kemmerly S M Durbin "Engineering Circuit Analysis", Tata McGraw Hill
1. Del Torro, "Electrical Engineering Fundamentals", 2nd Edition, Prentice Hall of India Pvt. Ltd., New Delhi (1994).
2. B.C. Theraja, "Principles of Electrical Engineering."
3. Kothari D P and Nagrath I J, "Basic Electrical Engineering", Tata McGraw Hill, New

Course: ECE- 203

BASICS OF ELECTRONICS ENGINEERING

UNIT-I

Energy bands and charge carriers in semiconductors: energy bands- metals- semiconductors and insulators- direct and indirect semiconductors- charge carriers in semiconductors: electrons and holes- intrinsic and extrinsic material- n-material and p-material- carrier concentration: Fermi level- EHPs- temperature dependence- conductivity and mobility- drift and resistance- effect of temperature and doping on mobility, Hall Effect. Diffusion of carriers- derivation of diffusion constant D - Einstein relation- continuity equation- p-n junctions: contact potential- equilibrium Fermi levels- space charge at junctions- current components at a junction: majority and minority carrier currents-

UNIT-II

Introduction to P N junction diodes: volt-ampere characteristics- capacitance of p-n junctions. Diode as circuit element. Half wave- full wave, Rectifiers: Centre Tapped and bridge rectifiers- working- analysis and design- C filter analysis- Zener and avalanche breakdown- Zener diodes: volt-ampere characteristics- regulated power supplies - IC based regulated power supplies. Tunnel diodes: tunneling phenomena- volt-ampere characteristics- Varactor diodes- Photo diodes: detection principle- light emitting diodes- volt-ampere characteristics.

UNIT-III

Bipolar junction transistors NPN and PNP transistor action- open circuited transistor- biasing in active region- majority and minority carrier distribution- terminal currents- operation- characteristics- Types of Transistor Configurations: - CE, CB and CC configurations. Transistor as Amplifier. Field effect transistors: operation- pinch off and saturation- pinch off voltage- gate control- volt-ampere characteristics.

Text Books:

1. Semiconductor Physics and Devices, *Basic Principles* by Donald E. Neaman, McGraw-Hill Publishing, 3rd Edition, 2003.
2. Physics of Semiconductor Devices by S. M. Sze, John Wiley and Sons, 2nd Edition, 1981.
3. Solid State Electronic Devices by B. G. Streetman, Prentice Hall of India Ltd, N. Delhi, 5th Edition, 2000.
4. Electronic devices and circuits by R. Boylest and L. Nashelsky, Prentice Hall Publications, 7th Edition.
5. Electronic devices by Floyd, Pearson Education, 7th Edition, 2008.
6. Electronic Principles: Malvino- Tata Mc Graw Hill.

COMPUTER PROGRAMMING

UNIT-I

Introduction to 'C' Language - Character set, Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic input/output statement, Simple 'C' programs Conditional Statements and Loops -Decision making within a program, Conditions, Relational Operators, Logical Connectives, *if* statement, *if- else* statement, Loops: *while* loop, *do while*, *for* loop, Nested loops, Infinite loops, *Switch* statement, structured Programming.

UNIT-II

Arrays - One dimensional arrays: Array manipulation; Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in an array; Two dimensional arrays, Addition/Multiplication of two matrices,

Functions- Modular programming and functions, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments.

UNIT-III

Structures and Unions - Structure , nested structure, structures and functions, structures and arrays: arrays of structures, structures containing arrays, unions, **Pointers**- Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, Arrays and Pointers, pointer arrays. File Processing - Concept of Files, File opening in various modes and closing of a file, Reading from a file, writing onto a file. Introduction to Object Oriented Programming with C++ . Objects and Classes. Object hierarchy. Inheritance, Polymorphism. Introduction to Advanced C/C++ Compilers viz. Eclipse/Netbeans.

Text Book:

1. E. Balaguruswamy, "Programming with ANSI-C"
2. Byron Gottfried "Programming with C"
3. A. Kamthane, "Programming with ANSI & Turbo C"
4. H. Schildt, "C++: The Complete Reference"
5. B. Stroustrup, "The C++ Programming Language"

Course No: MEC- 205

ENGINEERING MECHANICS

UNIT-I

Introduction: System of forces, Coplanar concurrent force system, Composition and Resolution of forces, Equilibrium of rigid bodies, Free body diagram, Lami's Theorem.

Analysis of Framed Structure: Reaction in different types of beams with different end conditions, bending moment and shear stress diagrams. Determination of reactions in members of trusses:

a) Analytical Methods b) Graphical Method, Centre of Gravity and Moment of Inertia: Concept of C.G. and Centroid, Position of Centroid, Theorem of Parallel and Perpendicular Axes, Moment of inertia of simple geometrical figures.

UNIT-II

Stress and Strain: Concept of Stress and Strain, Simple Stresses, Tensile, Compressive, Shear, Bending and Torsion, Stress-Strain Curves, Elongation of bars, Composite bars, Thermal Stresses, Elastic Constants, Mohr's Circle

UNIT-III

Physical Properties of fluids: System, Extensive and intensive properties: specific weight, mass density, specific gravity, viscosity, surface tension and capillarity, evaporability and vapour pressure, Newtonian and Non-Newtonian fluids, Fluids Statics: Pressure, Hydrostatic law, Pascal's law, Different types of manometer and other pressure measuring devices, Determination of metacentric height.

Fluid Kinematics and Dynamics: Classification of fluids, Streamline, Streakline and Pathlines, Flow rate and continuity equation, Bernoulli's Theorem, Kinetic energy correction factor and momentum correction factor in Bernoulli's equation.

Books Recommended

1. Bhavikatti S S and Rajashekarappa K G, "*Engineering Mechanics*", New Age International, New Delhi (1998).
2. Timoshenko S P and Young D H, "*Engineering Mechanics*", McGraw Hill (International) 4/e, New Delhi (1984).
3. Kumar D S, "*Fluid Mechanics*", S.K. Katira and Sons, Delhi (1998).
4. Modi P N and Seth S N, "*Fluid Mechanics*", Standard Book House, New Delhi (1998),
5. Engineering Mechanics by R.S. Khurmi



Course No. HUM-206

PROFESSIONAL COMMUNICATION

UNIT-I

The Seven C's of Effective Communication: 1. Completeness 2. Conciseness 3. Consideration
4. Concreteness 5. Clarity 6. Courtesy 7. Correctness;

Sentence construction: Phrases and Clauses; Varieties in Sentence Construction;

Paragraph Development: Techniques and Methods;

UNIT-II

Employment Communication: Job Application; Cover Letter; CV Writing; Resume Writing;

Interviews: Types of Interviews; Preparation for the Job Interview; Mock Interviews;

UNIT-III

Presentation Strategies: Purpose; Audience; Organizing Content;

Non-Verbal Communication: Meaning and Importance; Kinesics; Proxemics;

Dimensions of Speech: Syllable; Stress; Intonation;

Slide Shows: Preparing and Presenting Effective Slide Shows, Audio Visual Aids;

Technical proposals: Types, Techniques.

Text Books:

1. Koneru Aruna, Professional Communication McGraw Hill Pub. 1998, New Delhi
2. Murphy Herta, Herbert W Hilderbrandt, Jane P Thomas Effective Business Communication, 1997, McGraw Hill
3. Petit Lesikkar, Business Communication, 1994, McGraw Hill
4. Willey, Communication Skills Handbook, Summers Willey Pub. India

Course No: ELE-207L

BASIC ELECTRICAL ENGINEERING LAB

The students are required to conduct experiments on following practical work:

1. To get familiar with the working knowledge of the following instruments:
 - i. Digital Storage Oscilloscope.
 - ii. Cathode Ray Oscilloscope (CRO).
 - iii. Multimeter (Analog and Digital).
 - iv. Function Generator.
 - v. Power supply.
2.
 - i. To set the power supply in constant current and constant voltage mode, study of current limiting in power supplies, series and parallel combination of power supplies.
 - ii. Measurement of various parameters (voltage, frequency,) of a signal on DSO/CRO. Hands on with controls like volts/division, time /division, trigger, Xmag, positioning, time and voltage cursor measurements, saving and recalling of waveforms.
 - iii. measurement of resistance, capacitance, voltage, current, continuity, frequency using benchtype/handheld Multimeter.
 - iv. hands on with different controls (frequency, type of waveform, D.C. offset, duty cycle) of function generator.
3. Verification of Ohm's law for D.C. and A.C. circuits.
4. Verification of KVL and KCL.
5. Verification of Thevenin's and Norton's theorem.
6. Verification of Maximum Power Transfer Theorem.
7. Calculation of RMS, peak to peak, average value of an A.C. signal using DSO/CRO.
8. To plot the resonance curve for a series and parallel resonance.
9. Measurement of current, voltages and power in R-L-C series circuit excited by (single phase) AC supply

Course No: CSE-208L

COMPUTER PROGRAMMING LAB

List of Experiments

1. Program on Control Structures and Decision making statements.
2. Program using Loops.
3. Program using Switch case statements with use of break, continue and goto.
4. Programs on array operations.
5. Programs on matrix operations and manipulations.
6. Programs on modular programming and functions.
7. Programs on recursive functions.
8. Programs on structures and unions.
9. Programs on pointers and their manipulations.
10. Programs on files.

ELECTRONICS ENGINEERING LAB

1. Study of I-V characteristics of PN junction diode.
2. Study of I-V characteristics of Zener Diode diode.
3. Study of I-V characteristics of a Light emitting Diode diode.
4. To assemble a half wave rectifier using power diodes and LEDs and study their performance
5. To assemble a center tapped full wave rectifier using power diodes and LEDs and study their performance
6. To assemble a bridge wave wave rectifier using power diodes and LEDs and study their performance
7. Study of zener diodes as voltage regulators.
8. Design of an IC based Voltage regulator.

9. Study V-I characteristics of transistor (PNP and NPN). Calculate the performance parameters of transistor.
10. Use NPN transistor as an inverter /switch.