

Sl No	Course Code	Course Title	Credits	Cat
1	MAL205	Numerical Methods & Prob. theory	6	DC
2	ECL209	Digital Circuits & Logic Design	6	DC
3	EEL210	Electrical Sciences	6	DC
4	CSL202	Discrete Maths & Graph Theory	6	DC
5	CSL213	Data structures & prog. Design I	8	DC
6	CSL207	Web Technology	6	OC
7	CSP201	Software Lab I	2	DC
8	ECL208	Analog circuits	6	DE

Course Code & Title: - ECL208 : Analog Circuits

Content :

Semiconductors, mobility, conductivity, diffusion, continuity equation. Theory of P-N junction, diode characteristics, diode resistances, diode capacitances, switching properties, breakdown of diodes.

Bipolar junction transistor, transistor configuration & characteristics, breakdown of transistors, power transistors, thermal runaway of transistor, biasing of transistor, FETS, FET characteristics, biasing of FETS.

Low frequency small signal equivalent circuits of BJT & FETS, Gain, input/output impedances of equivalent circuits of BJTS & FETS, High frequency small signal equivalent circuits of BJT & FETS, difference amplifiers. Power amplifiers.

Feedback amplifiers, theory of feedback, advantages of negative feedback, feedback configurations, oscillators R-C & L-C, crystal oscillators.

Operational amplifiers- Properties and characteristics study of typical opamp,

Performance limitations, application of opamps- summer, inverter, integrator, differentiator, instrumentation amplifier.

Limiters, log/antilog amplifiers, multipliers, function generators, waveform generators

Text/References:

- Integrated Electronics, Millmann, Halkias, McGraw Hill.
- Electronics Devices Circuits, Millmann, Halkias, McGraw Hill.
- Electronic Devices & Linear Circuits, Garud, Jain .
- Operational Amplifier, Tobey, G.
- Op-amps & linear integrated circuits, Gayakwad Ramkant.

Course Code & Title: - ECL209 : Digital Circuits & Logic Design (DC) (L-T-P-C: 3-0-0-6)

Pre-requisite:

- Motivation for digital logic and digital circuits/systems, Analog vs. Digital Systems, basic concepts on SSI, MSI, VLSI circuit classification. Boolean algebra, Postulates and Theorems. Binary Codes: Weighted, non weighted, error detecting and error correcting codes
- Basics of PN Junction Diode, Diode applications in digital circuits, Basics of Transistor , CMOS characteristics, Standard Logic Families Diode Logic, TTL, CMOS Logic.
- Logic Gates, Truth tables, Sum of products, product of sums, Minimization of functions, Karnaugh maps and Simplification of logical functions using Quine-Mccluskey method.
- Combinational Circuit: Adders (ripple and carry look-ahead addition) and subtractors Decoders/Encoders, multiplexers/ Demultiplexers, code converters, realizing functions using Decoders, Multiplexers
- Sequential Circuits: Flip-flops and latches: D, T, J/K flip-flops, Master Slave Flip flops, shift registers. Counters (Synchronous/Asynchronous), different module counters with reset/clear facility, asynchronous and synchronous design using state and excitation tables. FSM implementation (Sequence Detector) .
- Overview of VLSI design process. PAL, PLAs, PROMS, CPLD, FPGA,ASIC structure overview. Hardware description language for digital circuit implementation(VHDL). Structural level implementation, Behavioral implementation and dataflow method.

Text/References:

- Kohavi Zvi, "Switching & Finite Automata Theory", TMH
- M.Morris Mano, "Digital Design", Pearson education
- Stephen Brown , Vranesic Z, "Fundamentals of Digital Logic with VHDL Design", TMH
- Bhaskar J, "VHDL Primer", B.S. Publication

Course Code & Title: - EEL210 : Electrical Sciences (DC) (L-T-P-C: 3-0-0-6)

Pre-requisite:

- Nodal analysis, Mesh analysis, Source transformation, Duality.
- Theorems: Superposition theorem, Reciprocity theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem.
- Two port network: Two port network parameters, their inter-relation, Interconnection of 2- Two port networks.

- Measurement of low, medium and high resistances, Elementary methods of measurement of inductances & capacitances, Generalised theory of A.C.Bridges, their uses for measurement of inductance and capacitance.
- Measuring instruments: Classification, Absolute and secondary instruments.
- Electronic instruments: Digital voltmeters, Digital multimeter, Cathode ray Oscilloscope, Syncroscope, etc.
- Generalized principle of operation of Alternators, Armature reaction, Principle of operation of Synchronous motors, Starting methods, Stepper motor.

Text/References:

Sawhney, A.K.; A Course in Electrical and Electronics Measurements and Instrumentation; (Eleventh Edition) Dhanpat Rai & Sons, Delhi.

1. Van Valkenburg ; Network analysis (Third Edition); Prentice Hall of India Private Ltd, 1.Delhi.

2.Kelkar A.R., Pandit P.S.; Network Analysis ; Prathibha Publications ; Nagpur

3.Theraja.B.L and Theraja A.K.; A Text book of Electrical Technology (Vol-II) ;

2.S.Chand and Company ; New Delhi

**Course Code & Title: - CSL213 : Data Structures & Program Design – I
(DSPD-I) (L-T-P-C: 3-0-0-6)**

Pre-requisite: CSL101 : Computer Programming

Types and operations, Iterative constructs and loop invariants, Quantifiers and loops, Structured programming and modular design, Illustrative examples, Scope rules, parameter passing mechanisms, recursion, program stack and function invocations including recursion, Overview of arrays and array based algorithms - searching and sorting, Divide and Conquer – Mergesort, Quicksort, Binary search, Introduction to Program complexity (Big Oh notation), Recurrence relations. Sparse matrices.

Structures (Records) and array of structures (records). Database implementation using array of records. Dynamic memory allocation and deallocation. Dynamically allocated single and multi-dimensional arrays.

Concept of an Abstract Data Type (ADT), Lists as dynamic structures, operations on lists, implementation of linked list using arrays and its operations. Introduction to linked list implementation using self-referential-structures/pointers.

Stack, Queues and its operations. Implementation of stacks and queues using both array-based and pointer-based structures. Uses of stacks in simulating recursive procedures/ functions. Applications of stacks and queues.

Files, operations on them, examples of using file.

Reference Books

1. The C programming language: Brian Kernighan and Dennis Ritchie, PHI-EEE (or Pearson)
2. How to Solve it by Computer: R. G. Dromey, Pearson Education
3. Data Structures & Program Design in C : Robert Kruse, G. L. Tondo and B. Leung PHI-EEE.

**Course Code & Title: - CSL207 : Web Technology (OC)
(L-T-P-C: 3-0-0-6) (FOR NIT MIZORAM)**

Pre-requisite:

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP. Introduction to JAVA Scripts – Object Based Scripting for the web. Structures – Functions – Arrays – Objects.

Introduction – Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames, navigator, Event Model – On check – On load – Onerror – Mouse rel – Form process – Event Bubblers – Filters – Transport with the Filter – Creating Images – Adding shadows – Creating Gradients – Creating Motion with Blur – Data Binding – Simple Data Binding – Moving with a record set – Sorting table data – Binding of an Image and table.

Audio and video speech synthesis and recognition - Electronic Commerce – E-Business Model – E- Marketing – Online Payments and Security – Web Servers – HTTP request types – System Architecture – Client Side Scripting and Server side Scripting – Accessing Web servers – IIS – Apache web server.

Database, Relational Database model – Overview, SQL – ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – ADO – Access a Database from ASP – Server side Active-X Components – Web Resources – XML – Structure in Data – Name spaces – DTD – Vocabularies – DOM methods.

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier applications – JSP – Overview – Objects – scripting – Standard Actions – Directives.

Text / References :

1. Internet and world wide web – How to Program : Deitel & Deitel, Goldberg , Pearson Education Asia, 2001.
2. Using HTML 4, XML and JAVA : Eric Ladd, Jim O’ Donnel , Prentice Hall of India – QUE , 1999
3. Web Programming: Desktop Management : Aferganatel, PHI, 2004
4. Web Technology: Rajkama , Tata McGraw-Hill, 2001

Course Code & Title: - CSP201 : Software Lab-I (DC)

Syllabus based on above mentioned course

Course Code & Title: - MAL205: Numerical Meth. & Prob. Theory (DC) **(L-T-P-C: 3-0-0-6)**

Pre-requisite:

Numerical Analysis: Solutions of algebraic and transcendental equations by Iteration method, method of false position, Newton-Raphson method and their convergence.

Solutions of system of linear equations by Gauss elimination method, Gauss Seidal method, LU decomposition method. Newton-Raphson method for system of nonlinear equations.

Eigen values and eigen vectors : Power and Jacobi methods.

Numerical solution of ordinary differential equations: Taylor's series method, Euler's modified method, Runge-Kutta method, Adam's Bashforth and Adam's Moulton, Milne's predictor corrector method.

Boundary value problems: Shooting method, finite difference methods.

Probability theory:

Random variables, discrete and continuous random variable, probability density function; probability distribution function for discrete and continuous random variable joint distributions.

Definition of mathematical expectation, functions of random variables, The variance and standard deviations, moment generating function other measures of central tendency and dispersion, Skewness and Kurtosis.

Binomial, Geometric distribution, Poisson distribution, Relation between Binomial and Poisson's distribution, Normal distribution, Relation between Binomial and Normal distribution.

Random processes, continuous and discrete, determinism, stationarity, ergodicity etc. correlation functions, autocorrelation and cross-correlation, properties and applications of correlation functions.

Text Books:

1. Jain, Iyengar and Jain : Numerical Methods for Engineers and Scientists, Wiley Eastern

2. V.K. Rohatgi and A.K.M. Ehsanes Sateh: An Introduction to Probabability and Statistics, John Wiley & Sons.

Reference Books

3. S. D. Cante and C. de Boor, Elementary Numerical Analysis, an algorithmic approach, McGraw-Hill.
4. Gerald and Wheatley : Applied Numerical Analysis, Addison-Wesley.
5. Spiegel, M.R.; Theory and problems of Probability and statistics; McGraw-Hill Book Company; 1980.
6. K.S. Trivedi: Probability Statistics with Reliability, Queuing and Computer Science applications, Prentice Hall of India Pvt. Ltd.

Course Code & Title: - CSL202 Discrete Maths & Graph Theory (DC)
(L-T-P-C: 3-0-0-6)

Pre-requisite :

- Set theory, operations on sets – relation and functions, continuity, partial order, equivalence relations, Peano axioms and induction.
- Mathematical logic, propositions, predicate logic, formal mathematical systems, algebra, homomorphism automorphism.
- Elements of Theory of some algebras, semigroups, monoids, groups.
- Rings, fields, lattices, Boolean Algebra
- Graphs, hypergraphs, transitive closure, trees, spanning trees
- Combinatorics , generating functions, recurrences, Counting theorem and applications.
- **Text/References:**
 - Kolman, " Discrete Mathematical Structures for Computer Science", Busby
 - Liu C.L" Combinatorial Mathematics", McGraw Hill Book Compan