

B.Tech. I Semester – 1	L	T	P	C
CS 101 : FUNDAMENTALS OF COMPUTERS & PROGRAMMING	3	0	4	5

INTRODUCTION TO COMPUTER AND ITS ARCHITECTURE	(02 Hours)
Introduction and Characteristics, Computer Architecture, Generations, Classifications, Applications, Central Processing Unit and Memory, Communication between various units, Processor speed, Multiprocessor system, Peripheral Buses, Motherboard Demonstration	
MEMORY AND VARIOUS INPUT AND OUTPUT DEVICES	(02 Hours)
Introduction to Memory, Input and Output Devices, Memory hierarchy, Primary memory and its types, Secondary Memory, Classification of Secondary memory, Various secondary storage devices and their functioning	
NUMBER SYSTEM	(01 Hours)
Introduction and type of Number system, Conversion between number system, Arithmetic operations in different number system, Signed and unsigned number system	
SOFTWARE COMPUTER LANGUAGES AND COMPUTER PROGRAM	(04 Hours)
Classification of Computer Languages, Introduction of operating system, Evolution, type and function of OS, Unix commands, Evolution and classification of programming language, Feature and selection of good programming language, Development of program, algorithm and flowchart, Program testing and debugging, Program documentation and Paradigms, Characteristics of good program	
WINDOWS OPERATING SYSTEM AND ITS ENVIRONMENT	(02 Hours)
Introduction to GUI based OS, Configuration, Setup, Services, Network Configuration	
LINUX OPERATING SYSTEM AND ITS ENVIRONMENT	(02 Hours)
Introduction to Unix based OS, Configuration, Setup, Services, Scripting, Network Configuration	
DEBUGGING TOOLS AND COMPILER OPTION	(04 Hours)
Different debugging tools, Commands, Memory dump, Register and Variable Tracking, Instruction and Function level debugging, Compiler Options, Profile Generation	
DATA COMMUNICATION, COMPUTER NETWORK AND INTERNET BASICS	(02 Hours)
Data communication and transmission media, Multiplexing and Switching, Computer network and network topology, Communication protocols and Network Devices, Evolution and basic internet term, Getting connected to internet and Internet application, Email and its working, Searching the web, Languages of internet, Internet and viruses	
PROGRAMMING USING 'C' LANGUAGE – INTRODUCTION	(6 Hours)

Characteristics of C language, Identifiers and keywords, Data types Constants and Variables, Declarations and Statements, Representation of expressions, Classification of Operators and Library Functions for Data input and output statements, Formatted input and output statements	
PROGRAMMING USING 'C' LANGUAGE – CONTROL STATEMENT, DATA STRUCTURES, POINTERS	(6 Hours)
Conditional Control Statements, Loop control statements, One dimensional array of numbers and characters, Two-dimensional array, Introduction and development of user defined functions, Different types of Variables and Parameters, Structure and union, Introduction to pointers, Pointer arithmetic, Array of pointers, Pointers and functions, Pointers and structures, File handling operations	
PROGRAMMING USING 'C' LANGUAGE – FUNCTIONS	(6 Hours)
Functions, Passing the arguments, Return values from functions, Recursion, Header Files Design, File handling operations, Read and Write to Secondary Devices, Read and Write to Input and Output Ports	
PROGRAMMING USING 'C' LANGUAGE – GRAPHICS, DEBUGGING	(5 Hours)
Include Graphics Library, Debugging, Linking, Compilation Option for Optimization, Make file	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED
<ol style="list-style-type: none"> 1. "Introduction to Computer Science", IITL Education Solutions Limited, Pearson Education, Fourth Impression, 2009. 2. "Programming with C Schaum's outline Series", Gottfried B.S., Outline Series, 2/E, Tata McGraw-Hill, 2006. 3. "The C Programming language", Brian W. Kernighan, Dennis M. Ritchie, 2/E, Prentice Hall PTR publication, 1988. 4. "Programming in ANSI C", E. Balagurusamy, 6/E, Tata Mc-Graw Hill, 2012. 5. "Programming in C", Pradip Dey, 2/E, Oxford University Press, 2012.

B.Tech. I Semester – 1	L	T	P	C
AS 102 : ENGINEERING MATHEMATICS	3	1	0	4

CALCULUS	(06 Hours)
Reorientation of calculus. Differentiation of Hyperbolic and Inverse Hyperbolic functions. Successive Differentiation, standard forms, Leibnitz's theorem and applications, Power series, Expansion of functions, Taylor's and Maclaurin's series, Differential Calculus	
DIFFERENTIAL EQUATION	(07 Hours)
Reorientation of differential equation, Exact differential equation and Integrating factors, First order and higher degree odes, solvable for p, y and x, Modeling of Real world problems particularly Engineering System, Application of first order differential equation including RC and RL network, Cartesian, polar and parametric form of standard curves	
INTRODUCTION TO COMPLEX VARIABLES	(05 Hours)
Analytic function, its applications, Linear transformation of complex domain, bilinear transformations, conformal mapping and its application, complex integration over closed contour.	
BASIC CONCEPTS OF INTEGRALS AND VECTOR CALCULUS	(06 Hours)
Multiple integrals, line integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meanings of gradient, divergence, curl and Laplacian with their properties.	
FOURIER SERIES	(06 Hours)
Periodic function, Trigonometric series, Fourier series for any function of period 2L. Fourier series and cosine series, Fourier half range series.	
LINEAR ALGEBRA	(12 Hours)
Elementary row and column transformation rank of matrix, Linear dependence, consistency of linear system of equations, Characteristic equation, Caley–Hamilton theorem, Eigen value, Eigen vector, Vector, Subspace, Matrix arithmetic, Singular Value Decomposition, Pseudoinverse, Linear Transformations, Positive Definite Matrix, Hessian Matrix, Group, Ring, Field	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Advanced Engineering Mathematics", E. Kreyszig, 8thEd, John Wiley & Sons., New York.
2. "Advanced Engineering Mathematics", Jain and Iyenger, Narosa Publications, New Delhi.
3. "Advanced Engg. Mathematics", O'Neil Peter, Thompson, Singapore, Ind. Ed. 2002.
4. "Mathematical Models in Biology and Medicine", J. N. Kapur, East west Press, New Delhi 1985.
5. "Methods of Applied mathematics ", F. B. Hilderband, PHI, New Delhi, 1968.
6. "Advanced Engineering Mathematics", Wiley C. R., MGH Int. Student Ed, 1993.

B.Tech. I Semester – 1	L	T	P	C
AS 103: ENGINEERING PHYSICS	3	0	2	4

THERMODYNAMICS	(08 Hours)
First law of Thermodynamics and its applications, Reversible and Irreversible Processes, Second law of Thermodynamics, Entropy and its calculations in reversible and irreversible processes, Entropy and second law of Thermodynamics, Entropy and disorder, Enthalpy and free energy.	
ELECTROMAGNETISM	(08 Hours)
Ampere’s theorem and its applications to determine Magnetic Induction (B) in case of (i) a St. conductor carrying current, (ii) Solenoid, (iii) Toroid. Lorentz force. Hall effect in metals, High energy particles accelerators- Cyclotron, Betatron, Gauss’s laws for Magnetism, Types of matter Magnetism – Diamagnetism –Paramagnetism – Ferromagnetism, Nuclear Magnetism, Three magnetic vectors.	
OPTICS	(10 Hours)
Spatial and temporal coherence, Interference by division of wave front and amplitude, interference by thin films, Measurement of film thickness, Michelson’s Interferometer, Michelson’s interferometer and light propagation, Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at double slits, Multiple slits and circular aperture, Rayleigh criterion, Resolving power of grating, telescope and prism, Polarization, polarizing sheets, Malu’s law, Polarization by reflection and Brewster’s Law, Polarization by double reflection, circular and elliptical polarization, Quarter wave and half wave plates, Polarization by scattering of light, Huygen’s theory for uni-axial and Bi-axial crystals.	
MODERN PHYSICS	(8 Hours)
Source of light, Cavity radiators, Spectral power distribution, Wien’s, Rayleigh -Jean’s and Planck’s laws. Dual nature of matter and radiation, photoelectric effect, Einstein’s photoelectric equation, Compton scattering, De-Broglie waves phase velocity (wave velocity) and group velocity, Uncertainty principle, X-Rays, X-Ray diffraction and Bragg’s law, Quantum Physics of Hydrogen atom, Bohr’s postulates and applications in explanation of hydrogen spectrum. Bohr’s correspondence principle, Frank and Hertz experiment.	
LASER PHYSICS	(8 Hours)
Stimulated and spontaneous emission, Einstein’s A and B coefficients. Optical pumping and population inversion. Different lasers, gas solid state lasers (He-Ne laser and Ruby laser) and application in holography.	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Physics", Resnick and Haliday, Part I and II (Wiley Eastern), 2008.
2. "Concept of the Modern Physics", A. Beiser, 2008.
3. "Introduction to Modern Optics", A. Ghatak, 1972.
4. "Sears and Zeemansky's University Physics", Hugh D. Young and Roger A. Freedman, 12th Edition, Pearson India (LPE)
5. "Introduction to Electrodynamics", David J. Griffith, Addison-Wesley

B.Tech. I Semester – 1	L	T	P	C
EC 104: ELECTRONIC DEVICES AND CIRCUITS	3	0	2	4

PN DIODE AND DC POWER SUPPLY	(06 Hours)
PN diode Theory, Construction, Operation with Forward and Reverse VI Characteristics, PN Junction in breakdown Region, PN diode Application as Rectifier, Half Wave Rectifier, Center Tap and Bridge Rectifier, Filter circuits, C, LC and Pie filters with circuit Diagram and waveforms, Zener Diode theory, Construction, Operation with forward and reverse VI characteristics, Zener Voltage Regulator, Diode as clamper and clipper, Switched mode power supply (SMPS).	
GENERAL DIODES THEORY AND APPLICATIONS	(06 Hours)
Photodiode theory, V-I characteristics and application, LED Theory, 7 segment LED circuit diagram and Multi colour LED, LED applications, LCD Theory and application, Varactor Diode Theory and application, Shockley Diode Theory and characteristics, PIN diode theory and characteristics, LASER diode theory and applications.	
BJT CONFIGURATION AND APPLICATIONS	(07 Hours)
Bipolar Junction Theory, Naming The Transistor Terminals, Transistor Action, Transistor Symbols, Common Collector, Common Emitter And Common Base Configurations, Different Biasing Techniques, Concept of Transistor Amplifier, Introduction to FET Transistor and its feature.	
WAVESHAPING CIRCUITS	(07 Hours)
Linear Wave Shaping Circuits, RC High Pass and Low Pass Circuits, RC Integrator and Differentiator Circuits, Nonlinear Wave Shaping Circuits, Series-Shunt and Two level Diode Clipper Circuits, Clamping Circuits, Clamping Circuits Theorem, Practical Clamping	
OPERATIONAL AMPLIFIER AND APPLICATIONS	(07 Hours)
Introduction to OP-AMP with block diagram, Schematic Symbol of OP-AMP, The 741 package style and pinouts, Specifications of Op-amp, Inverting amplifier, Non-inverting amplifier, Voltage Follower circuit, Multistage OP-AMP circuit, OP-AMP averaging amplifier, OP-AMP subtractor	
DIFFERENT INSTRUMENTS	(09 Hours)
Role and Important of General purpose test instrument, Cathode RAY Oscilloscope (CRO), and Digital storage Oscilloscope (DSO), Theory and applications, Function Generator, Different Power supply, Digital Multi-meter (DMM).	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Electronic Principles", Malvin Albert & David J. Bates, Tata McGraw Hill, 7th edition, 2007.
2. "Electronic Devices & Circuit Theory", Boylestad Robert L. & Nashlesky Louis, PHI Publication, 8th edition, 2007.
3. "Principles of Electronics", Mehta V. K. & Mehta Rohit, S. Chand & Co. Ltd., 11th Revised Ed., 2008.
4. "Electronics Devices", Thomas L. Floyd, Pearson Education, 7th Ed., 2005
5. "Electronics Devices & Circuits", Cheruku D. R. and Battula T. K., Pearson Educations, 2nd Ed., 2008.
6. "Basic of Electronics", De Debashis, Pearson Education, 1st Ed., 2008.
7. "Electronics Circuits- Discrete and Integrated", Schilling Donald L. and Belove E., McGraw-Hill, 3rd Ed., 1989, Reprint 2008.
8. "Integrated Electronics", Millman Jacob, Halkias Christos C. and Parikh C., McGraw-Hill, 2nd Ed., 2009.
9. "Pulse, Digital and Switching Waveforms", Millman J., Taub H. and Mothiki Suryaprakash, McGraw-Hill, 2nd Ed., 2007.

B.Tech. I Semester – 1	L	T	P	C
AL 105: ENGLISH AND COMMUNICATION SKILLS	3	0	2	4

SPOKEN ENGLISH	(14 Hours)
<p>Individual and group speaking activities - on topics like Introductions, making request, suggestions, invitations, acceptance, refusal, seeking permission, giving a description, stating likes and dislikes, agreeing and disagreeing, conversing on telephones, inquires, complains, compliments, expressing thanks and apologies etc.(Audio Visual aids could be used for the above)</p> <p>Mock interview- objectives, preparation and practice for interview as student and as job applicant</p> <p>Group discussion- strategy of speaking in a GD, types of GD and evaluation components</p>	
WRITTEN ENGLISH	(14 Hours)
<p>Business letters- structures of business letters, essential of good business letters, letters of enquiries, complaints, request etc.</p> <p>Résumé writing- structure and types</p> <p>Report writing – types and format of technical reports</p> <p>Writing formal speeches - welcome address, introduction of guest speakers, farewell, vote of thanks etc.</p> <p>Common errors - grammar, spellings and choice of words</p> <p>Editing</p>	
PRESENTATION SKILL	(7 Hours)
<p>Technical Presentation- content organization, different tools for presentation, summarization, preparing individual and group presentations, nuances of delivery</p>	
COMMUNICATION SKILL	(7 Hours)
<p>Nonverbal communication- body language, appearance and space</p> <p>Technical discussion- technical article reading and narrating</p> <p>JAM (Just a minute) sessions</p> <p>Team based activities</p>	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Technical Communication Principles and Practice", Raman, Meenakshi & Sharma Sangeeta, 2nd Edition, OUP, New Delhi, 2011.
2. "Business Correspondence and Report Writing", Sharma R.C. & Mohan Krishna, 3rd Edition, Tata McGraw Hill, New Delhi, 2007.
3. "Basic Business Communication skills for Empowering the Internet generation", Raymond V. Lesikar and Marie E Flatley, Tata McGraw Hill publishing company limited. New Delhi 2005.
4. "Communication Skills for Technical Students", Farahthullah, T.M, 5th Edition, Orient Blackswan, Kolkatta, 2009.
5. "Common Errors in Everyday English", Saumya Sharma, OUP, New Delhi, 2017.
6. "Developing Communication Skills", Krishna Mohan and MeeraBanerji, McMillan Co., 1990
7. "Creative English Communication", N.Krishnaswami and T.Shariram, McMillan Co., 1992
8. " Modern Business Letters", King and Cree, Orient Longman, 1990
9. "Let's Talk English" , M.I.Joshi, Gujjar Prakashan, Ahmedabad, 1995

B.Tech. I Semester – 1	L	T	P	C
CS 106: ICT WORKSHOP – I	0	0	4	2

HTML AND PHP	(14 Hours)
HTML, CSS, PHP, MySQL, Java Script	
Matlab	(14 Hours)
Numerical toolbox, Symbolic Toolbox, DSP Toolbox, Simulink	
(Total Contact Time: 28 Hours)	

BOOKS RECOMMENDED

1. Web enabled commercial application development using HTML, DHTML, JavaScript, PERLCGI, Ivan Bayross.
2. Beginning PHP5
3. Complete Reference PHP
4. Beginning PHP, Apache, MySql web development
5. http://www.phpmyadmin.net/home_page/index.php
6. <http://www.w3schools.com/html/default.asp>
7. Tags reference : <http://www.w3schools.com/tags/default.asp>
8. <http://www.w3schools.com/css/default.asp>
9. <http://www.php.net/manual/en/>
10. http://www.phpmyadmin.net/home_page/index.php
11. <http://in3.php.net/manual/en/function.mysql-select-db.php>
12. MATLAB & Simulink Student Version Release 14, ISBN 0-9755787-2-3
13. <http://www.datagenetics.com/blog/march12012/index.html>

Lab Practice/Assignments of 56 Hours

B.Tech. I Semester – 2	L	T	P	C
AS 201: DISCRETE MATHEMATICS	3	1	0	4

GRAPH THEORY	(08 Hours)
Graphs, Definition & basic concepts of finite & infinite graph, Incidence & Degree, Isomorphism, Subgraph, Walk, Path & circuits, Operations on graphs, connected graph, Disconnected graph & components, Complete graph, Regular graph, Bipartite graph, Euler’s graph, Hamiltonian paths & circuits, Weighted graphs, Applications, Directed & Undirected graphs, Connectivity of graphs.	
TREES	(06 Hours)
Definition & properties of trees, Pendent vertices in a tree, Distance between two vertices Centre, Radius & diameter of a tree, Rooted & binary trees, Representation of Algebraic structure by Binary trees, Binary search trees, Spanning trees & fundamental circuits.	
RELATION & LATTICES	(08 Hours)
Definition & Basic properties, Graphs of relation, Matrices of relation, Equivalence relation, Equivalence classes, Partition, Partial ordered relation, Posets, Hasse diagram, Upper bounds, Lower bound, GLB & LUB of sets, Definition & properties of Lattice, Sub lattice, Distributive & modular lattices, complemented & Bounded Lattices, complete lattices & Boolean algebra	
GROUP THEORY	(08 Hours)
Basic properties of Group, Groupoid, semigroup & monoid, Abelian group, Subgroup, Cosets, Normal subgroup, Lagrange’s theorem, Cyclic group , Permutation group, Homomorphism & Isomorphism of groups, Basic properties, error correction & detection code.	
MATHEMATICAL LOGIC & PROGRAM VERIFICATION	(12 Hours)
Propositions, logical operators & propositional algebra, Predicates & quantifiers, Interaction of quantifiers with logical operators, Logical interference & proof techniques, Formal verification of computer programs (elements of Hoare logic).	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED
<ol style="list-style-type: none"> 1. “Discrete Mathematics and Its Applications”, Rosen K.H., McGraw Hill, 6th Ed., 2006. 2. “Discrete Mathematical Structure”, Kolman B., Busby R.C. & Ross S., Prentice Hall of India Pvt. Ltd, 5thEd, 2003. 3. “Discrete Mathematical Structure with Applications to Computer Science”, Tremblay J. P. &

Manohar R., McGraw Hill, 1999.

4. "Graph theory with applications to Engineering & Computer Science", DeoNarsingh., Prentice Hall of India Pvt. Ltd., 2000.
5. "Elements of Discrete Mathematics", Liu C.L., McGraw Hill, 2000.

B.Tech. I Semester –2	L	T	P	C
EE 202: ELECTRICAL NETWORKS	3	0	2	4

AC FUNDAMENTALS AND CIRCUITS	(07 Hours)
<p>Alternating voltages and currents and their vector and time domain representations, average and RMS values, form factor, phase difference, power and power factor, purely resistive inductive and capacitive circuits, R-L, R-C, R-L-C series circuits, impedance and admittance, circuits in parallel, series and parallel resonance, Complex algebra and its application to circuit analysis, Circuit Transient, Initial and Final Value Theorem, DC and Induction Machines, Electrical Measurements, Power System</p>	
POLYPHASE CIRCUITS AND TRANSFORMES	(04 Hours)
<p>Balanced two phase and three phase systems, Star and Mesh connections, Calculations for balanced three phase networks, Polyphase vector diagram, and measurement of power in three phase circuits. Principle of transformer, construction - shell type, core type, transformer on no-load, with load, phasor diagram for transformer under no-load and loaded condition (with unity, lagging power factor load) equivalent circuit, open circuit and short circuit test, efficiency, voltage regulation.</p>	
NETWORK CONCEPTS	(04 Hours)
<p>Network element symbols and conventions; Active element conventions; current and voltage conventions; loops and meshes; Nodes; coupled circuits and Dot conventions.</p>	
MESH CURRENT AND NODE VOLTAGE NETWORK ANALYSIS	(07 Hours)
<p>Definitions of mesh currents and nodal voltages; Choice of mesh currents or nodal voltages for setting up operating equations necessary for network analysis. Self and mutual inductances. Setting up network equations by inspection in impedance or admittance matrix forms. Kichhoff's Voltage Law And Mesh Current Analysis, Mesh Equation in The Impedance Matrix Form By Inspection, Solution Of Linear Mesh Equations, Kichhoff's Current Law and Nodal Voltage Analysis Nodal Equation In The Form Of Admittance Matrices By Inspection, Solution of Linear Nodal Equations And Circuits Analysis Using Matrices.</p>	
NETWORK THEOREMS AND GRAPH	(07 Hours)
<p>Linearity and Superposition, Independent and Dependent Source and their Transformations, Thevenin, Norton, Reciprocity and Maximum Power Transfer Theorems, Use of these Theorems In Circuit Analysis, Duality and Dual of A Planner Network. Fundamental Concepts, Definition of Graph and Various Related Terms, Paths and Circuits Connections, Tree Of a Graph, Cut Sets and Tie Sets, Non-separable Planner and Dual Graphs, Matrices of Oriented Graphs, Properties and Inter-Relationship of Incidence, Tie Set and Cut Set Matrices, Complete Analysis Using Tie Set and Cut Set Matrices.</p>	
WAVE FORM ANALYSIS BY FOURIER SERIES	(06 Hours)

Trigonometric and complex exponential forms; the frequency spectra of periodic wave forms; the Fourier Integral and continuous frequency spectra; Fourier transform and their relationship with Laplace transform.	
NETWORK FUNCTIONS AND TWO PORT PARAMETERS	(07 Hours)
Poles and zeros of a function, physical and analytical concepts, Terminal and terminal pairs, Driving point immittances, transfer functions,. Definitions, calculations and interrelationship of impedance, admittance, hybrid and transmission line parameters for four terminal networks. Image impedance and its calculations for symmetrical and unsymmetrical p, T and Ladder Networks.	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Engineering Circuit Analysis", W.H.Hyat, J.E.Kemmerly, S.M.Durbin, 6thEdition, TMH, 2006.
2. "Electric Circuits", Joseph A Edminister, SI (metric) edition, Schaum's outline series, McGraw hill, 2nd edition 1983.
3. "Network Analysis", Van Valkenburg M E, 3rd Edition, PHI, 2002.
4. "Network Theory, Analysis & Synthesis", Samarjit Ghosh, PHI, 2005.
5. "Network Analysis & Synthesis", C.L.Wadhwa, Revised 3rdEdition, New Age International Publishers, 2007.
6. "Basic electrical engineering", Kothari and Nagrath, 2nd edition, 2007, Tata McGraw-Hill Education.
7. "Principles of Electrical Technology", Harry Cotton, 1967, Pitman.
8. "Basic electrical engineering", V. N. Mittle & Arvind Mittal, 2nd edition, 2005, Tata McGraw-Hill Education.
9. "Basic Electrical Engineering", Arthur Eugene Fitzgerald, David E. Higginbotham, 3rd edition, 1954, Tata McGraw-Hill Education.
10. "Principle of Power System", Mehta V. K., S. Chand & Co., 2005.
11. "Electrical Machinery", Bimbhra P. S., Khanna Pub., Delhi 10th Ed., 1998.
12. "Electrical Machies", Mukherjee P. K. and Chakravorti S., Dhanpat Rai and Co., 4th Ed., 2001.
13. "A Course In Electrical and Electronics Measurement and Instrumentations", Sawhney A. K., Dhanpat Rai & Co., 2nd Ed., 2005.

B.Tech. I Semester – 2	L	T	P	C
CS 203: DATA STRUCTURES AND ALGORITHMS	3	0	2	4

INTRODUCTION TO DATA STRUCTURE	(04 Hours)
Basic Terminology, Internal representation of Primitive Data structure: Integers, Floating point numbers, Packed decimal, Characters, Structures, Unions, and Pointers.	
BASIC DATA TYPES	
Arrays: Definition, Memory organization, Operations on Arrays: Traversing, Insertion, Deletion, Updating, Resizing	(03 Hours)
Stacks: Basic operations, Stack, Dstack and applications	(02 Hours)
Queues : Operations of queues, Circular Queue, Priority Queue, Dequeue, Application of queues	(03 Hours)
Linked list : Singly linked lists and memory representation, Operations of Link list (Traversing, Searching, Insertion, Deletion, inversion, concatenation, copying and comparison, allocation and deallocation), Doubly linked list and operations, Circular Link list, Multilevel link list	(04 Hours)
TREES	(09 Hours)
Introduction, Binary Trees and their representation, Operations on Binary trees: Creation, transformation of trees into binary trees, traversal, Searching, Insertion and Deletion. Type of trees: Complete Binary trees, Extended binary trees, General trees, AVL trees, Threaded trees, B trees Application: Arithmetic expression evaluation, infix-prefix-postfix notation conversion.	
GRAPH	(08 Hours)
Formal Introduction, types of graph, Representation of graphs: Sequential, List structure, Adjacency list, multilinked representation, Search in directed and undirected graphs, BFS, DFS, Transversal Connected Component and Spanning trees, Shortest path and Transitive Closure, Activity Networks, Topological Sort and Critical Paths.	
ILLUSTRATED ALGORITHMS	(09 Hours)
Sorting (Bubble, Selection, Quick, Radix, Bucket sort, Heap sort), Dictionaries, hashing, analysis of collision resolution techniques, Searching(Linear Search, Binary Search), Character String and different	

string operations	
Tutorials will be based on the coverage of the above topics separately	(14 Hours)
(Total Contact Time: 42 Hours + 14 Hours = 56 Hours)	

BOOKS RECOMMENDED

1. "An Introduction to Data Structures with Applications", Trembley & Sorenson, 2/E, TMH, 1991
2. "Data Structures using C and C++", Tanenbaum & Augenstein, 2/E, PHI, 2007
3. "Fundamentals of Data Structures", Horowitz and Sahani, Galgotia Publications, reprint 2004.
4. "Introduction to Algorithms", T. H. Cormen, C. E. Leiserson, R. L. Rivest, 2/E, PHI, 2001
5. "Data Structures and Program Design in C", Robert L.Kruse, C.L.Tondo and Brence Leung, Pearson Education, 2/E, 2001

B.Tech. I Semester – 2	L	T	P	C
EC 204: DIGITAL LOGIC DESIGN	3	0	2	4

BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS	(04 Hours)
Basic Logic Operation and Logic Gates, Truth Table, Basic Postulates and Fundamental Theorems of Boolean Algebra, Standard Representations of Logic Functions- SOP and POS Forms, Simplification of Switching Functions-K-Map and Quine-Mccluskey Tabular Methods, Synthesis of Combinational Logic Circuits.	
COMBINATIONAL LOGIC CIRCUIT USING MSI INTEGRATED CIRCUITS	(07 Hours)
Binary Parallel Adder; BCD Adder; Encoder, Priority Encoder, Decoder; Multiplexer and Demultiplexer Circuits; Implementation of Boolean Functions Using Decoder and Multiplexer; Arithmetic and Logic Unit; BCD To 7-Segment Decoder; Common Anode and Common Cathode 7-Segment Displays; Random Access Memory, Read Only Memory And Erasable Programmable ROMS; Programmable Logic Array (PLA) and Programmable Array Logic (PAL).	
INTRODUCTION TO SEQUENTIAL LOGIC CIRCUITS	(07 Hours)
Basic Concepts of Sequential Circuits; Cross Coupled SR Flip-Flop using NAND or NOR Gates; JK Flip-Flop Rise Condition; Clocked Flip-Flop; D-Type and Toggle Flip-Flops; Truth Tables and Excitation Tables For Flip-Flops; Master Slave Configuration; Edge Triggered And Level Triggered Flip-Flops; Elimination Of Switch Bounce Using Flip-Flops; Flip-Flops With Preset And Clear.	
SEQUENTIAL LOGIC CIRCUIT DESIGN	(07 Hours)
Basic Concepts Of Counters And Registers; Binary Counters; BCD Counters; Up Down Counter; Johnson Counter, Module-N Counter; Design Of Counter Using State Diagrams And Table; Sequence Generators; Shift Left And Right Register; Registers With Parallel Load; Serial-In-Parallel-Out(SIPO) And Parallel-In-Serial-Out(PISO); Register Using Different Type Of Flip-Flop.	
REGISTER TRANSFER LOGIC	(06 Hours)
Arithmetic, Logic And Shift Micro-Operation; Conditional Control Statements; Fixed-Point And Floating-Point Data; Arithmetic Shifts; Instruction Code And Design Of Simple Computer.	
PROCESSOR LOGIC DESIGN	(04 Hours)
Processor Organization; Design Of Arithmetic Logic Unit; Design Of Accumulator.	
CONTROL LOGIC DESIGN	(07 Hours)
Control Organization; Hard-Wired Control; Micro program Control; Control Of Processor Unit; PLA Control.	

(Total Contact Time: 42 Hours)

BOOKS RECOMMENDED

1. "Digital Logic and Computer Design", Mano Morris, Pearson Education, 2005.
2. "Digital Electronics Practice Using Integrated Circuits", Jain and Anand, TMH, 2004
3. "Logic and Computer Design Fundamentals", Kime Charles, Pearson Education, 2004.
4. "Digital Circuits and Logic Design", Lee Samual, PHI, 1998.
5. "Digital Fundamentals", Floyd and Jain, Pearson Education, 2006.

B.Tech. I Semester – 2	L	T	P	C
AE 205: ENGINEERING MECHANICS	3	0	2	4

INTRODUCTION FORCES/EQUILIBRIUM OF RIGID BODY	(06 Hours)
<p>Scalar and vectors, system of forces, resultant force, Statics of particles. Free-body diagrams. Equilibrium of particle in two dimensions, Resultants of three or more concurrent forces, Resolution of a force into components. Rectangular components of a force. Resultants by rectangular components, Concurrent force system in space: Resolution of a force into rectangular components in space, Coplanar Non-Concurrent Force Systems, Moments about Points and Axes. Equilibrium, Non-coplanar Non-concurrent Forces.</p>	
CENTROID MOMENT OF INERTIA	(06 Hours)
<p>Distributed forces: Centroid and centre of gravity. Determination of centroid of lines and areas using integral technique, Determination of centroid of composite wires and areas, Centroid of volumes. Theorems of Pappus-Guldinus and its applications, Second moment of areas. Definition of moment of inertia. Determination of moment of areas by integration, Parallel axis theorem for Moment of Inertia. MI of composite areas.. Concept of Mass moment of inertia of bodies.</p>	
TRUSS	(06 Hours)
<p>Types of structures in Engineering. Trusses and beams: definition, stability and determinateness, Determination of reactions at supports for planar trusses. Basic assumption for analysis of trusses. Procedures for analysis of trusses, Analysis of plane trusses by method of joints. Concept of zero force members. Analysis of plane trusses by method of sections.</p>	
BEAMS AND CABLES	(10 Hours)
<p>Beams- Definitions, types of beams, types of loading, types of supports. Determination of reactions for simply supported and overhanging beams. Relation between distributed load, Shear force and Bending moment Shear force and Bending moment in beams with diagrams</p> <p>Cables- Cables with Concentrated Loads</p>	
FRICTION	(04 Hours)
<p>The Laws of Dry Friction. Coefficients of Friction, Angles of Friction, Analysis of systems involving dry frictions such as ladders spheres etc., Belt Friction, Analysis of flat and v-belt.</p>	
KINETICS OF PARTICLES	(05 Hours)
<p>Force and acceleration. Newton's laws of motion. D'Alembert's principle, Dependent motion of particles. Analysis for dependent motion of particles, Impulse and Momentum: Concept, Definition, Principle of linear impulse and momentum, Conservation of linear momentum of a system of particles.</p>	

VIBRATIONS	(05 Hours)
Definitions, Equation of motion for single degree of freedom, Introduction to free and forced vibrations. Procedure for analysis of system involving free and forced vibrations, Example on free vibration, Example on forced vibration, Concept of earthquake induced waves and its effect on structures.	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Vector mechanics for engineers: Statics and Dynamics", Beer F.P. and Johnston E.R. Tata McGraw-Hill, New Delhi.
2. "Engineering Mechanics: Statics and Dynamics", Desai J.A. and Mistry B.B., Popular Prakashan, Surat.
3. "Engineering Mechanics: Statics and Dynamics", Hibbeler R.C., Prentice Hall of India, New Delhi.
4. "Engineering Mechanics: Statics and Dynamics", Meriam J.L., and Kraige L.G., John Wiley and sons, New York.
5. "Engineering Mechanics: Statics and Dynamics", Rajsekaran S., Vikas Publication, New Delhi.
6. "Applied Mechanics", Shah H. J. and Junarkar S. B., Charotar publication, Anand.
7. "Engineering Mechanics", Bhavikatti S. S. and Rajashekarappa K. G., Wiley 'Eastern Ltd.

B.Tech. I Semester – 2	L	T	P	C
EC 206: SIGNALS AND SYSTEMS	3	1	0	4

ELEMENTS OF SIGNAL SPACE THEORY	(04 Hours)
Signal Measure, Classification of Signals, Operation on Discrete Signals, Decimation and Interpolation, Source Standard Discrete Signals, Discrete Time Harmonics and Sinusoids.	
SAMPLING	(05 Hours)
Sampling Theorems, Ideal Sampling, Impulse Sampling, Natural Sampling, Signal Reconstruction and Aliasing, Sampling of Band Pass Signal.	
LINEAR TIME-INVARIANT SYSTEM	(08 Hours)
Discrete-Time Systems, Digital Filters, Response of Digital Filter, Solving Difference Equation, The Impulse Response, Applications-oriented Examples, Discrete Convolution, Convolution of Finite Sequences, Stability and Causality of LTI Systems, Deconvolution, Discrete Correlation.	
THE Z-TRANSFORMATION AND LAPLACE TRANSFORM	(11 Hours)
The z-transformation, Properties of the Z-Transformations, Inversion of the z-transform, The One-Sided Z-transformation, Analysis of Linear-Time-Invariant Systems in the Z-Domain. Laplace Transform and Characteristics	
FREQUENCY ANALYSIS OF SIGNAL AND SYSTEMS	(06 Hours)
Frequency Analysis of Continuous-Time Signals, Frequency Analysis of Discrete-Time Signals, Properties of The Fourier Transformation For Discrete-Time(DTFT) Signals, Frequency-Domain Characteristics Of Linear-Invariant Systems	
DISCRETE FOURIER TRANSFORM	(06 Hours)
Frequency Domain Sampling, The Discrete Fourier Transform(DFT), Properties of DFT, Linear Filtering Methods Based on the DFT, Frequency Analysis of Signals Using the DFT, Fast Fourier Transform	
(Total Contact Time: 42 Hours)	

BOOKS RECOMMENDED

1. "Digital Signal Processing: A Modern Introduction", Ambardar Ashok, Cengage Learning, 2nd Ed., 2007.
2. "Digital Signal Processing: Principle, Algorithms, and Applications", Proakis John G., Pearson Educations, 3rd Ed.,2003.
3. "Signal and Systems", Oppenheim Alan V., Wilsky Alan S. and Nawab Hamid S., Pearson Educations, 3rd Ed., 2006.
4. "Linear Systems and Signals", Lathi B. P., Oxford University Press, 2nd Ed., 2007.
5. "Introduction to Signal and Systems", Stuller John Alan, Thomson India Edition, 1st Ed., 2007.
6. "Fundamental of Signals and Systems", Roberts M. J. and Govind Sharma, Tata McGraw-Hill, 2nd Ed., 2010.