With effect from the academic year from 2019-20

SCHEME OF INSTRUCTION AND SYLLABI (MODEL CURRICULUM) OF BE III & IV SEMESTERS OF FOUR YEAR DEGREE

IN

COMPUTER SCIENCE & ENGINEERING

Institute Vision:

- To be centre of excellence in technical education and research

Institute Mission:

- To address the emerging needs through quality technical education and advanced research

Department Vision:

- To become a center of excellence in the field of Computer Science and Engineering that produces innovative, skillful, socially responsible and ethical professionals.

Department Mission:

- To provide a curriculum that balances engineering fundamentals, modern technologies and research.
- To provide opportunities for solving real world problems.
- To provide opportunities for overall personal and social skill development.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)
Affiliated to OU; All U.G. and 5 P.G. Programmes (Civil, CSE, ECE, Mech. & EEE)
Accredited by NBA; Accredited by NAAC - 'A' Grade (UGC); ISO Certified 9001:2015
Chaitanya Bharathi P.O, CBIT, Campus, Gandipet, Kokapet (V),

Gandipet Mandal, Ranga Reddy District, Hyderabad-500075, Telangana
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Website: www .cbit.ac.in Phone : 040-24193276 / 277 / 279

B.E. Program Educational Objectives (PEOs)

1. Practice their profession with confidence by applying new ideas and technologies for the sustainable growth of Industry & Society.
2. To pursue higher studies for professional growth with superior ethics & Character.
3. Engage in Research leading to innovations/products or become a successful Entrepreneur.

B.E. Program Outcomes (PO's)

At the end of the program, students will be able to?

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
2. Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities, with an understanding of the limitations.
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B.E. Program Specific Outcomes (PSOs)

1. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

2. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER– III

S.No	Course Code	Title of the Course	Scheme of Instruction			Duration of SEE in Hours	Scheme of Examination		
			Hours per Week				Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	18EEC01	Basic Electrical Engineering	3	1	0	3	30	70	4
2	18CSC07	Data Structures	3	0	0	3	30	70	3
3	18CSC08	Discrete Mathematics	3	1	0	3	30	70	4
4	18CSC09	Digital Electronics and Logic Design	3	0	0	3	30	70	3
5	18MEC09	Principles of Management	3	0	0	3	30	70	3
6	18CEM01	Environmental Science	2	0	0	2	-	50	0
PRACTICAL									
7	18EEC02	Basic Electrical Engineering Lab	0	0	2	2	15	35	1
8	18CSC10	Data Structures Lab	0	0	2	2	15	35	1
9	18CSC11	Digital Electronics and Logic Design Lab	0	0	2	2	15	35	1
10	18EGC03	Soft Skills	0	0	2	2	15	35	1
		TOTAL	**17**	**2**	**8**		**210**	**470**	**21**

L: Lecture T: Tutorial D: Drawing P: Practical
CIE - Continuous Internal Evaluation SEE - Semester End Examination

18EEC01

BASIC ELECTRICAL ENGINEERING

Instruction	3L+1T Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
Continuous Internal Evaluation	30 Marks
Credits	4

Course Objectives: The objectives of this course are

1. To understand the behavior of different circuit elements R, L & C, and the basic concepts of electrical circuit analysis.
2. To know the concepts of AC circuits, RMS value, Average value, Phasor analysis etc.
3. To understand the basic principle of operation of Transformer and DC machines.
4. To understand the basic principle of operation of DC machines and AC machines.
5. To know about different types of electrical wires and cables, domestic and industrial wiring.
6. To understand safety rules and methods of earthing

Course Outcomes: On Successful completion of this course, student will be able to

1. Acquire the concepts of Kirchhoff's laws and network theorems and able to get the solution of simple dc circuits.
2. Obtain the steady state response of RLC circuits and also determine the different powers in AC circuits.
3. Acquire the concepts of principle of operation of Transformers and DC machines.
4. Acquire the concepts of principle of operation of DC machines and AC machines.
5. Acquire the knowledge of electrical wiring and cables and electrical safety precautions.
6. Recognize importance of earthing and methods of earthing and electrical installations.

UNIT - I

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation, Superposition, The venin and Norton Theorems, Time-domain analysis of first order RL and RC circuits.

UNIT - II

AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel). Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT - III

Transformers: Construction, Working principle, EMF Equation, Ideal and Practical transformer, Equivalent circuit of Transformer, OC and SC tests on a transformer, Efficiency and Regulation, Auto transformer.

UNIT - IV

DC and AC Machines: DC Generators: Construction, Principle of operation, EMF equation, Classification, Characteristics of shunt, series and compound generators. DC Motors: Classification, Torque equation, Characteristics, Efficiency, Speed Control of Series and Shunt Motors. Three-Phase Induction Motors: Construction, Principle of operation, Torque equation, torque-slip characteristics, Power stages, speed control of induction motors.

UNIT - V

Electrical Installations: Electrical Wiring: Types of wires and cables, Electrical Safety precautions in handling electrical appliances, electric shock, first aid for electric shock, safety rules. Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Earthing, Elementary calculations for energy consumption.

Text books:

1. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
2. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

Suggested Reading:

1. D.P.Kothari & I.J.Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. V. D. Toro, "Electrical Engineering Fundamentals ", Prentice Hall India, 1989.
3. D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
4. P.V.Prasad, S.Sivanagaraju, R.Prasad, "Basic Electrical and Electronics Engineering", Cengage Learning, 1st Edition, 2013.

18CSC07

DATA STRUCTURES

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
Continuous Internal Evaluation	30 Marks
Credits	3

Pre-requisites: Basic knowledge of programming language such as C or C++ is preferred (but not mandatory) and some mathematical maturity also will be expected.

Course Objectives: The objectives of this course are

1. Basic linear and non-linear data structures.
2. Analyzing the performance of operations on data structures.
3. Different balanced binary trees, which provides efficient implementation for data structures.

Course Outcomes: On Successful completion of this course, student will be able to

1. Understand the basic concepts of data structures.
2. Analyze the performance of algorithms.
3. Distinguish between linear and non-linear data structures.
4. Identify the significance of balanced search trees.
5. Establish a suitable data structure for real world applications.

UNIT - I

Introduction: Data Types, Data structures, Types of Data Structures, Operations, ADTs, Algorithms, Comparison of Algorithms, Complexity, Time- space tradeoff. **Recursion**: Introduction, format of recursive functions, recursion Vs. Iteration, examples. **Sorting:** Quick sort, Merge Sort, Selection Sort

UNIT - II

Linked Lists: Introduction, Linked lists, Representation of linked list, operations on linked list, Comparison of Linked Lists with Arrays and Dynamic Arrays, Types of Linked Lists and operations-Circular Single Linked List, Double Linked List, Circular Double Linked List

UNIT - III

Stacks and Queues: Introduction to stacks, applications of stacks, implementation and comparison of stack implementations. Introduction to queues, applications of queues and implementations, Priority Queues and applications

UNIT - IV

Trees: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Representations of Binary Trees, Tree Traversal. **Binary Search Trees:** Representation and operations. **Heap Tree:** definition, representation, Heap Sort. **Graphs:** Introduction, Applications of graphs, Graph representations, graph traversals, Minimal Spanning Trees.

UNIT - V

Hashing: Introduction, Hashing Functions- Modulo, Middle of Square, Folding, Collision Techniques-Linear Probing, Quadratic Probing, Double Hashing, **Balanced Search Trees:** AVL Trees, Red-Black Trees, Splay Trees, B-Trees

Text Books:

1. Narasimha karumanchi, "Data Structures and Algorithms Made Easy", Career Monk Publications, 2017
2. S. Sahni and Susan Anderson-Freed, "Fundamentals of Data structures in C", E.Horowitz, Universities Press, 2nd Edition.
3. ReemaThareja, "Data Structures using C", Oxford University Press.

Suggested Reading:

1. D.S.Kushwaha and A.K.Misra, "Data structures A Programming Approach with C", PHI.
2. Seymour Lipschutz, "Data Structures with C", Schaums Outlines, Kindle Edition

Online Resources:

1. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
2. https://www.edx.org/course/foundations-of-data-structures
3. https://sites.google.com/site/merasemester/data-structures/data-structures-1#DS

18CSC08

DISCRETE MATHEMATICS

Instruction	3L+1T Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	4

Course Objectives: The objectives of this course are

1. To provide theoretical foundations of computer sciences.
2. To develop an understanding of logic, set theory, counting, functions, relations and proof techniques.
3. To familiarize with algebraic systems and graph theory.

Course Outcomes: On Successful completion of this course, student will be able to

1. Apply Propositional and Predicate logic for problem solving in various domains.
2. Understand Set Theory, Relations, Functions and Lattices as partially ordered sets.
3. Model and solve the real world problems using Generating Functions and Recurrence Relations.
4. Understand and apply the principles of graphs and trees to simple applications.
5. Study Algebraic systems and their general Properties.

UNIT - I

Fundamental Principles of counting: The Rules of Sum and Product, permutations, Combinations. **Introduction to Propositional Calculus**: Basic Connectives and Truth tables, Logical Equivalence: Laws of Logic, Logical Implication; Rules of Inference. **Predicates**: The Use of Quantifiers, Quantifiers, Definitions and the Proofs of Theorems.

UNIT - II

Sets: Sets and Subsets, Operations on sets and the Laws of Set Theory, Counting and Venn Diagrams. **Relations and Functions:** Cartesian Products and Relations, Functions: Composition of functions, one-one, Onto and Inverse of functions, Pigeon hole principle, partial ordering relations, POSET, Hasse diagrams, Lattices as Partially Ordered Sets, Equivalence relations.

UNIT - III

Generating Functions: Binomial Theorem, Generating Functions, Functions of Sequences, Calculating Coefficient of generating functions. **Recurrence Relations:** The First Order Linear Recurrence Relation, Second Order Linear. Homogenous Recurrence relations with constant coefficients, Non Homogenous Recurrence relations

UNIT - IV

Introduction to Graphs: Graphs and their basic properties - degree, path, cycle, Sub graphs, Complements and Graph Isomorphism, Euler trails and circuits, Hamiltonian paths and cycles, planar graphs, Euler formula, Graph Coloring and Chromatic polynomial. **Trees**: Definitions, Properties, Rooted Trees, Spanning Trees, Minimum Spanning trees: The Algorithms of Kruskal and Prim.

UNIT - V

Algebraic Structures: Algebraic Systems: Examples and General Properties, Semi groups and Monoids. **Groups:** Definitions and Examples, Subgroups, Homomorphisms and cyclic groups.

Text Books:

1. Ralph P. Grimaldi, "Discrete and Combinatorial Mathematics", An Applied Introduction, 4th edition, Pearson Education, 2003.
2. R.K.Bisht, H.S.Dhami, "Discrete Mathematics", Oxford University Press, Published in 2015.

Suggested Reading:

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", 7th edition, Tata McGraw-Hill, 2005
2. J.P. Tremblay, R.Manohar, "Discrete Mathematical Structures with Applications to Computer Science", TATA McGraw-Hill Edition, 1995.
3. Joe L.Mott, Abraham Kandel, Theodore P. Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", 2nd Edition, PHI, 1986.
4. David D.Railey, Kenny A. Hunt, "Computational Thinking for the Modern Problem Solving", CRC Press, 2014.

Online Resources:

1. https://nptel.ac.in/courses/111107058/
2. https://nptel-discrete-mathematics-5217

18CSC09

DIGITAL ELECTRONICS AND LOGIC DESIGN

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course Objectives: The objectives of this course are

1. To understand the architecture of basic building blocks, logic gates and minimization techniques including Quine-Mcclusky method.
2. To analyze and design the Combinational and Sequential circuits.
3. To familiarize the notations of HDL descriptions in Verilog.

Course Outcomes: On Successful completion of this course, student will be able to

1. Familiarize with number systems, simplification of Boolean functions.
2. Manipulate simple Boolean expressions using maps and tabulation method.
3. Design basic digital circuits in Computer Hardware and system.
4. Use high level HDLs such as Verilog for the design of Combinational and Sequential circuits.
5. Configure registers and counters for different applications.

UNIT - I

Digital Systems and Binary Numbers: Digital systems, Binary numbers, Number base conversions, Octal and Hexadecimal numbers, Complements of Numbers, Binary codes. **Boolean Algebra and logic Gates:** Binary logic, Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

UNIT - II

Minimization of Switching Functions: Introduction, the map method, minimal functions and their properties, the tabulation procedure, the prime implicant chart. **NAND and NOR Gates**: NAND Circuits, Two-level Implementation, Multilevel NAND Circuits, NOR Circuits. **Exclusive OR Gates**: Odd Function, Parity Generation and Checking.

UNIT - III

Combinational Logic Design: Combinational Circuits. **Analysis Procedure:** Derivation of Boolean Functions, Derivation of the Truth Table, Logic Simulation. **Design Procedure:** Decoders, Encoders, Multiplexers, Binary Adders, Adder-Subtractor, Binary Multiplier, HDL Representations – Verilog.

UNIT - IV

Sequential Circuits: Sequential circuit definitions, Latches, Flip Flops, sequential circuit analysis, sequential circuit design, design with D Flip Flops, designing with JK Flip-Flops, HDL representation for sequential circuits - Verilog.

UNIT - V

Registers: Registers, Shift registers. **Counters**: Ripple Counters, Synchronous Binary counters, Other Counters. **Memory and Programmable Logic**: Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Logic Array (PLA), Programmable Array Logic (PAL).

Text Books:

1. Morris Mano M. and Michael D.Ciletti, "Digital Design, With an Introduction to Verilog HDL", Pearson 5th edition, 2013.
2. ZVI Kohavi, "Switching and Finite Automata Theory", Tata McGraw Hill 2 edition, 1995.

Suggested Reading:

1. H.T. Nagle, "Introduction to Computer logic", Prentice Hall 1975.
. Stephen Brown, Zvonko Vranesic, "Fundamentals of Digital Logic with VHDL design, McGraw Hill 2nd Edition, 2009.

18MEC 09

PRINCIPLES OF MANAGEMENT

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course Objectives: The objectives of this course are

1. Understand basic fundamentals and insights of management
2. Understand the nature and purpose of planning
3. Gain the knowledge about the frame work of organizing
4. Understand the essence and significance of directing
5. Recognize the importance of controlling and its outcomes

Course Outcomes: On Successful completion of this course, student will be able to

1. Identify and evaluate the principles of management
2. Demonstrate the ability to have an effective and realistic planning
3. Identify the nature and the type of organization
4. Apply the tools and techniques of directing
5. Explain and evaluate the necessity for controlling and further refinement of an organization.

UNIT - I

Management: Definition of management**,** science or art, manager vs entrepreneur; managerial roles and skills;. Evolution of management, Basic management theories by FW Taylor, Henry Fayol, Types of Business Organizations, sole proprietorship, partnership, company, public and private enterprises; Organization culture and environment; Current trends and issues inmanagement

UNIT - II

Planning: Nature and purpose of Planning, types of Planning, objectives, setting objectives, policies, Strategic Management, Planning Tools and Techniques, Planning plant location and layout, Decision making steps & processes.

UNIT - III

Organizing: Nature and purpose of Organizing, formal and informal organization, organization structure, types, line and staff authority, departmentalization,

delegation of authority, centralization and decentralization, job design, human resource management, HR planning, Recruitment selection, Training & Development, Performance Management, Career planning and Management

UNIT - IV

Directing: Individual and group behavior, motivation, motivation theories, motivational techniques, job satisfaction, job enrichment, leadership, types & theories of leadership, effective communication.

UNIT - V

Controlling: system and process of controlling, budgetary and non-budgetary control techniques, use of computers and IT in management control, productivity problems and management, control and performance, direct and preventive control, reporting.

Text Books:

1. S.P. Robins and M. Couiter, "Management", 10/e.,Prentice Hall India, 2009.
2. JAF Stoner, RE Freeman and DR Gilbert, "Management", 6/e., Pearson Education,2004.

Suggested Reading:

1. P.C. Tripathy & P.N. Reddy, "Principles of Management", Tata McGraw Hill,1999
2. Harold Koontz and Cyril O'Donnell "Principles of Management", Tata McGraw Hill, 2017

18CEM01

ENVIRONMENTAL SCIENCE
(MANDATORY COURSE)

Instruction	2L Hours per week
Duration of Semester End Examination	2 Hours
Semester End Examination	50 Marks
CIE	0 Marks
Credits	0

Course Objectives: The objectives of this course are

1. Identify environmental problems arising due to engineering and technological activities and the science behind those problems.
2. Become aware about the importance of eco system and biodiversity for maintaining ecological balance.
3. To identify the importance of interlinking of food chain.
4. Learn about various attributes of pollution management and waste management practices.
5. To make the students contribute for capacity building of nation for arresting and/or managing environmental disasters.

Course Outcomes: On successful completion of this course, student will be able to

1. Define environment, identify the natural resources and ecosystems and contribute for the conservation of bio-diversity.
2. Suggest suitable remedial measure for the problems of environmental pollution and contribute for the framing of legislation for protection of environment.
3. Relate the social issues and the environment and contribute for the sustainable development.
4. Follow the environmental ethics.
5. Contribute for the mitigation and management of environmental disasters.

UNIT - I

Environmental Studies: Definition, Scope And Importance, Need For Public Awareness. **Natural resources:** Use And Over Utilization of Natural Resources - Water Resources, Food Resources, Forest Resources, Mineral Resources, Energy Resources, Land Resources.

UNIT - II

Ecosystems: Concept of an Ecosystem, Structure And Function of an Ecosystem, Role of Producers, Consumers And Decomposers, Energy Flow in an Ecosystem, Food Chains, Food Webs, Ecological Pyramids, Nutrient Cycling, Bio-Geo Chemical Cycles, Terrestrial And Aquatic Acosystems.

UNIT - III

Biodiversity: Genetic, Species And Ecosystem Biodiversity, Bio-Geographical Classification of India, India as a Mega Diversity Nation. Values of Biodiversity, Hot-Spots of Biodiversity, Threats to Biodiversity, Endangered And Endemic Species of India, Methods of Conservation of Biodiversity

UNIT - IV

Environmental Pollution: Cause, Effects And Control Measures of Air Pollution, Water Pollution, Marine Pollution, Soil Pollution, Noise Pollution And Solid Waste Management, Nuclear Hazards. **Environmental Legislations:** Environment Protection Act, Air, Water, Forest & Wild Life Acts, Issues Involved in Enforcement of Environmental Legislation, Responsibilities of State And Central Pollution Control Boards.

UNIT - V

Social issues and the environment: Water Conservation Methods: Rain Water Harvesting And Watershed Management, Environmental Ethics, Sustainable Development and Climate Change: Global Warming, Ozone Layer Depletion, Forest Fires, And Contemporary Issues.

Text Books:

1. Y. Anjaneyulu, "Introduction to Environmental Science", B S Publications, 2004.
2. Suresh K. Dhameja, "Environmental Studies", S. K. Kataria& Sons, 2009.

Suggested Reading:

1. C. S. Rao," Environmental Pollution Control Engineering", Wiley, 1991.
2. S. S. Dara, "A Text Book of Environmental Chemistry &Pollution Control", S. Chand Limited, 2006.

18EEC02

BASIC ELECTRICAL ENGINEERING LAB

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	35 Marks
Continuous Internal Evaluation	15 Marks
Credits	1

Course Objectives: The objectives of this course are

1. To acquire the knowledge of different types of electrical elements.
2. To verify the basic electrical circuit laws and theorems.
3. To determine the parameters and power factor of a coil.
4. To calculate the time and frequency responses of RLC circuits.
5. To determine the characteristics of Transformers.
6. To determine the characteristics of dc and ac machines.

Course Outcomes: On successful completion of this course, student will be able to

1. Get an exposure to common electrical components and their ratings.
2. Make electrical connections by wires of appropriate ratings.
3. Understand the circuit analysis techniques.
4. Determine the parameters of the given coil.
5. Understand the basic characteristics of transformer.
6. Understand the basic characteristics of dc and ac machines.

List of Laboratory Experiments/Demonstrations:

1. Demonstration of Measuring Instruments and Electrical Lab components.
2. Verification of KCL and KVL.
3. Time response of RL and RC circuits.
4. Calculation of permittivity of a choke or coil by Wattmeter Method.
5. Verification of Thevenin's and Norton's theorems.
6. Turns ratio / voltage ratio verification of 1-PhTransformers.
7. OC and SC tests on a given 1-PhTransformer.
8. Observation of Excitation Phenomenon in Transformer.
9. Measurement of 3-Ph power in a balanced system (By2-Wattmetermethod).
10. Measurement of 3-Ph Energy by an Energy Meter (Demonstration of Principle).

11. Load test of DC Shunt motor.
12. Speed control of DC Shunt motor.
13. Load test of 3-Ph Induction motor.
14. Demonstration of LT Switch gear Equipment/Components.
15. Demonstration of cut-out section of Machines like DC Machine, Induction Machine etc.

Note: At least TEN experiments should be conducted in the semester.

18CSC10

DATA STRUCTURES LAB

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	35 Marks
Continuous Internal Evaluation	15 Marks
Credits	1

Pre-requisites: Any Programming Language(C/Python)

Course Objectives: The objectives of this course are to:

1. Understand basic concepts data structures and abstract data types.
2. Differentiate between linear and non-linear data structures.
3. Analyze various searching, sorting and hashing techniques.

Course Outcomes: On successful completion of this course, student will be able to

1. Implement the abstract data type.
2. Implement linear data structures such as stacks, queues using array and linked list.
3. Implement non-linear data structures such as trees, graphs.
4. Analyze various searching and sorting techniques.
5. Design and develop real world problem using suitable data structures.

List of Experiments

1. Implementation of Quick Sort, Merge Sort, Selection Sort.
2. Implementation of Insert, Delete and Search operations on Single Linked List.
3. Implementation of Insert, Delete and Search operations on doubly Linked List.
4. Implementation of Stack using array and linked list.
5. Converting of Infix Expression to Postfix.
6. Implement the algorithm for Evaluation of Postfix.
7. Implementation of Queue using array and linked list.
8. Implementation of Heap Sort.
9. Implementation of Binary Tree Traversals.
10. Implementation of Binary Search Tree.
11. Implementation of Graph Traversal Techniques.
12. Implementation of Hashing.

Text Books

1. Brian W Kernighan, Dennis Ritchie, "C Programming Language", PH PTR, 2nd Edition.
2. Richard M Reese, "Understanding and Using C Pointers", O`Reily, 2013.

Online Resources:

1. https://nptel.ac.in/courses/106102064/
2. https://www.udemy.com/algorithms-and-data-structures-in-python/

18CSC11

DIGITAL ELECTRONICS AND LOGIC DESIGN LAB

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	35 Marks
CIE	15 Marks
Credits	1

Course Objectives: The objectives of this course are

1. To simulate and synthesize combinational logic circuits.
2. To simulate and synthesize sequential logic circuits.
3. To write a test bench for verifying the functionality and implement procedures for any digital design.

Course Outcomes: On Successful completion of this course, student will be able to

1. Design a Digital circuit using Verilog HDL.
2. Understand various abstraction levels of a digital design.
3. Verify the functionality of a design using Test bench.
4. Simulate and synthesize combinational logic circuits.
5. Simulate and synthesize sequential logic circuits.

Write a Verilog HDL to Simulate and synthesize the following

1. Implement operators and operands using Verilog.
2. Logic Gates: AND, OR, BUFFER.
3. Arithmetic Units: Adders and Sub tractors.
4. Magnitude Comparator, BCD to Excess 3, BCD to 7-segment display.
5. Multiplexers and De-multiplexers.
6. Encoders, Decoders, Priority Encoder.
7. Implementation of logic function using Multiplexers and Decoders.
8. Implementation of Ripple Carry Adder.
9. Flip-Flops.
10. Design of Synchronous Counters.

Text Book:

1. Samir Palnitkar, "Verilog HDL, A guide to Digital design and synthesis", 2/e, Pearson Education, 2008.

Suggested Reading:

1. Michael D. Ciletti, "Advanced Digital Design with Verilog HDL", PHI, 2005.

18EGC03

SOFT SKILLS
(Common to all Branches)

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	35 Marks
CIE	15 Marks
Credits	1

Course Objectives: The course will introduce the students to:

1. Imbibe an impressive personality, etiquette, professional ethics & values, effective time management & goal setting.
2. Understand the elements of professional update & upgrade through industry exposure in a mini-live project. Understand confidence building strategies and thereby to make effective presentations through PPTs.
3. Learn what constitutes proper grooming and etiquette in a professional environment. Acquire the necessary skills to make a smooth transition from campus to corporate.

Course Outcomes: After successful completion of the course the students will be able to:

1. Be assertive and set short term and long term goals. Also learn to manage time effectively and deal with stress.
1. Win in professional communication situations and participate in group discussions with confidence. Write abstracts.
2. Write effective resumes. Plan, prepare and face interviews confidently.
2. Adapt to corporate culture by being sensitive - personally and sensible - professionally. Draft an SOP.
3. Apply the soft skills learnt in the mini-live project, by collecting and analyzing data and making oral and written presentations on the same.

Exercise 1

Main Topics: Thinking Skills, Personality Development – Effective Time Management, setting realistic goals, self confidence and assertiveness, stress management, moral values.

Flipped Sessions: Personal Sensitivity & Professional Sensibility (Reading & Discussion),

Writing Input: Writing to Express - Drafting & Delivering a Speech (Free Writing Exercise).

Exercise 2

Main Topics: Advanced Group Discussion with Case studies: Dynamics of group discussion, intervention, summarizing and modulation of voice, body language,

relevance, fluency and coherence. **Flipped Sessions:** Importance of Professional Updating & Upgrading (Reading & Discussions).**Writing Input:** Writing with Precision - Writing Abstracts.

Exercise 3

Main Topics: Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, mock interviews. Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skills.

Flipped Sessions: Mock Interviews (Video Sessions &Practice), **Writing Input:** Writing to Reflect - Resume Writing.

Exercise 4

Main Topic: Corporate Culture – Grooming and etiquette, communication media, academic ethics and integrity, **Flipped Sessions:** Corporate Culture, Etiquette & Grooming (Video Sessions and Practice through Role-play), **Writing Input:** Writing to Define - Writing an effective SOP.

Exercise 5

Main Topic: Mini Project – General/Technical. Research, developing a questionnaire, data collection, analysis, written report and project seminar.Elements and Structure of effective presentation. Presentation tools – Body language, Eye-contact, Props and PPT.

Flipped Sessions: Effective Presentations (Video & Writing Sessions, Practice through Emulation), **Writing Input:** Writing to Record - Writing minutes of meeting.

Suggested Reading:

1. Madhavi Apte , "A Course in English communication", Prentice-Hall of India, 2007.
2. Dr. ShaliniVerma, "Body Language- Your Success Mantra", S Chand, 2006.
3. Ramesh, Gopalswamy, and Mahadevan Ramesh, "The ACE of Soft Skills", New Delhi: Pearson, 2010.
4. Van Emden, Joan, and Lucinda Becker, "Presentation Skills for Students", New York: Palgrave Macmillan, 2004.
5. Flipped Class-room: Students explore the concept first and then trainer explains it, students work on their own.

Web Resources:

1. https://www.goskills.com/Soft-Skills
2. https://www.trainerbubble.com
3. https://www.skillsconverged.com

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A)
SCHEME OF INSTRUCTION AND EXAMINATION
B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER - IV

S.No	Course Code	Title of the Course	Scheme of Instruction			Duration of SEE in Hours	Scheme of Examination		
			Hours per Week				Maximum Marks		Credits
			L	T	P/D		CIE	SEE	
THEORY									
1	18ECC34	Basic Electronics	3	0	0	3	30	70	3
2	18MTC09	Probability and Statistics	3	1	0	3	30	70	4
3	18CSC12	Computer Architecture and Micro Processor	3	0	0	3	30	70	3
4	18CSC13	Data Base Management Systems	3	0	0	3	30	70	3
5	18EGM 01	Indian Constitution	2	0	0	2	-	50	0
PRACTICAL									
6	18ECC35	Basic Electronics Lab	0	0	2	2	15	35	1
7	18CSC14	Computer Architecture and Micro Processor Lab	0	0	3	3	25	50	1.5
8	18CSC15	Data Base Management Systems Lab	0	0	3	3	25	50	1.5
9	18CSC16	IT Workshop (Latex/Scilab)	0	1	2	3	25	50	2
		TOTAL	**14**	**2**	**10**		**210**	**515**	**19**

L: Lecture T: Tutorial D: Drawing P: Practical
CIE - Continuous Internal Evaluation SEE - Semester End Examination

18ECC34

BASIC ELECTRONICS

Instruction	3 L Hours per week
Duration of Semester End Examination	3Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Prerequisite: Knowledge about semiconductor physics and basic electrical engineering.

Course Objectives: The objectives of this course is to make students to :

1. Describe semiconductor devices principle and to understand the characteristics of junction diode and transistors.
2. Understand working principles of Oscillators and Amplifiers.
3. Understand the working principle of the regulators and transducers.

Course Outcomes: On Successful completion of this course, student will be able to

1. Use semiconductor devices in making circuits like rectifiers, filters, regulators etc.
2. Design amplifier and oscillators
3. Compare various types of power amplifiers.
4. Analyze the principles and practices for instrument design to development the real world Problems.
5. Apply concepts of various electronic circuits.

UNIT – I

Semiconductor Theory: Energy levels, Intrinsic and Extrinsic Semiconductor, Mobility, Diffusion and Drift current, Hall effect, Law of mass action, Characteristics of P-N Junction diode, current equation, Parameters and Applications. **Rectifiers:** Half wave and Full wave Rectifiers Bridge and center tapped with and without filters, Ripple factor, regulation and efficiency.

UNIT – II

Transistors: Bipolar and field effect transistors with their h-parameter equivalent circuits, Basic Amplifiers classification and their circuits (Qualitative treatment only). **Regulators and Inverters**: Zener Diode**,** Breakdown mechanisms, Characteristics, Effect of Temperature, Application as voltage regulator.

UNIT – III

Feedback Amplifiers: Properties of Negative Feedback Amplifier, Types of Negative Feedback, Effect of negative feedback on Input impedance and Output impedance, Applications (Qualitative treatment only).

Oscillators: principle of oscillations, LC Type-Hartley, Colpitt and RC Type-Phase shift, Wien Bridge and Crystal Oscillator (Qualitative treatment only).

UNIT – IV

Operational Amplifiers: Basic Principle, Ideal and practical Characteristics and Applications-Summer, Integrator, Differentiator, Instrumentation Amplifier. **Power Amplifiers:** Operation of Class A, Class B, Class AB and Class C power amplifiers

UNIT – V

Data Acquisition systems: Study of transducers-LVDT, Strain gauge. **Photo Electric Devices and Industrial Devices:** Photo diode, Photo Transistor, LED, LCD, SCR, UJT Construction and Characteristics and their applications only. **Display Systems:** Constructional details of C.R.O and Applications.

Text Books:

1. Robert L. Boylestad, Louis Nashelsky, "Electronic Devices and Circuits Theory", Pearson Education, 9th edition, LPE, Reprinted, 2006.
2. Morris Mano, "Digital Design", Pearson Education, Asia 2002.

Suggested Reading:

1. Jacob Millman and C., Halkias, "Electronic Devices", McGraw Hill, Eight Edition, Reprint1985.
2. Ramakanth A. Gayakwad, "Op-Amps and Linear Integrated Circuits", Prentice Hall of India, 3rd edition,1985.
3. W. D. Cooper, A. Helfric, "Electronic Instrumentation and Measurement Techniques", PHI, 4th edition,2010.

18MTC09

PROBABILITY AND STATISTICS
(For CSE and IT)

Instruction	3 L+1T Hours per week
Duration of Semester End Examination	3Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	4

Course Objectives: The objectives of this course are instead of able enable is appropriate.

1. To Able to learn and Analyzing data in Linear and Non-Linear form.
2. To Able to fit the hypothetical data using probability distribution.
3. To Understand the data using the testing of Hypothesis.
4. To Able to Analyzing time series data using trend analysis.
5. To Able to formulate and get the solution of real world problem.

Course Outcomes: On successful completion of this course, student will be able to

1. Use the principle of Least Squares approximating for estimating the value.
2. Use the basic probability for fitting the Random phenomenon.
3. Analyzing data using different methods of hypothesis testing.
4. Use the Moving Averages Methods for trend analysis.
5. Analyze the random phenomena of real world data.

UNIT – I

Basic Statistics: Measures of Central Tendency, Measures of Dispersion, Skewness (SKP & SKB) For Frequency Distribution, Kurtosis, Curve Fitting by The Method of Least Squares, Fitting of Straight Lines, Second Degree Parabola And Growth Curve. ($y = ae^{bx}, y = ax^b \wedge y = ab^x$.)

UNIT – II

Discrete Probability Distributions: Basic Probability, Conditional Probability, Bayes Theorem, Random Variable, Discrete Random Variable, Continuous Random Variable, Properties of Probability Mass Function, Probability Density Function, Mathematical Expectation Variance, Co-Variance And Properties, Poisson Distribution, MGF, CGF, Fitting of Poisson Distribution.

UNIT – III

Continuous Probability Distribution And Bivariate Distribution: Continuous Probability Distribution-Normal Distribution-Standard Normal Random Variable (MGF, Expectation, Variance, Properties of Normal Curve)-Areas Under Normal Curve-Exponential Distribution (MGF, CGF, Expectation, Variance)-Uniform Distribution (MGF, Expectation, Variance)-Bivariate Data Two Dimensional Discrete Random Variable, Continuous Random Variable, Marginal Probability Function, Properties of Joint Probability Function-Sum And Differences.

UNIT – IV

Small Sample Test: Inferential Statistics-Test of Significance-Large Sample Test For Single Proportion, Difference of Proportions, Single Mean, Difference of Means And Differences of Standard Deviations. Small Sample Test-Test For Single Mean, Differences of Means, Test For Ratio of Variances, Chi-Square Test For Goodness of Fit And Independent of Attributes.

UNIT – V

Time Series Analysis and ANOVA: One Way Classification-Assumptions For ANOVA Test-ANOVA For Fixed Effect Model-Two Way Classification-ANOVA For Fixed Effect Model-Components of Time Series-Measurement of Trend - Method of Semi Averages- Moving Averages Method (3 Years And 5 Years).

Text Books:

1. S.C.Gupta, V.K.Kappoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons, 2014.
2. S.C.Gupta, V.K.Kappoor, "Fundamentals of Applied Statistics", Sultan Chand and Sons, 2014.
3. Sheldon Ross, "A First Course in Probability", 9th Edition, Pearson publications, 2014.

Suggested Reading:

1. W. Feller, "An Introduction to Probability Theory and its Applications", Vol. 1, 3rd Ed., Wiley, 1968.

18CSC12

COMPUTER ARCHITECTURE AND MICRO PROCESSOR

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
Continuous Internal Evaluation	30 Marks
Credits	3

Pre-requisites: Digital Electronics and Logic Design.

Course Objectives: The objectives of this course are

1. To understand the basic principles of Instruction Level Architecture and Instruction Execution, memory system design.
2. To learn various I/O devices and its operations, knowledge on Instruction Level Parallelism.
3. To impart the knowledge on micro programming and pipelining techniques.

Course Outcomes: On Successful completion of this course, student will be able to

1. Understand the functional block diagram of single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
2. Design assembly language program for specified computing 16 bit multiplication, division and I/O device interface.
3. Derive flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
4. Design a memory module and analyze its operation by interfacing with the CPU.
5. Apply design techniques to enhance performance using pipelining, parallelism and RISC methodology.

UNIT - I

Basic Structure of Computers: Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multi-computers. **Arithmetic:** Addition and Subtraction of Signed numbers, Design of fast adders, Multiplication of positive numbers, Signed-Operand Multiplication, Integer Division.

UNIT - II

Basic Processing Unit: Fundamental concepts, Execution of a complete instruction, Multiple-Bus organization, Hardwired control, Micro programmed

control. **8086 Architecture:** CPU Architecture, Internal operation, Machine language instructions Addressing modes, Instruction formats, Instruction execution timing.

UNIT - III

Assembler Language Programming: Instruction format, Data transfer instructions, Arithmetic instructions. **Assembler Language Programming:** Branch instructions, Loop instructions, NOP and HLT, Flag manipulation instructions, Logical instructions, Shift and Rotate instructions, Directives and Operators. **Modular Programming:** Linking and Relocation, Stacks, Procedures, Interrupts and Interrupt routines, Macros and String instructions, REP prefix.

UNIT - IV

Peripheral devices and their characteristics: Input-output subsystems, I/O device interface, I/O transfers –program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCSI, USB. **Pipelining:** Basic concepts, Data hazards, Instruction hazards, Influence on instruction sets, Data path and control considerations, Superscalar operation, Performance considerations.

UNIT – V

The Memory System: Semiconductor RAM Memories, Cache Memories, Performance considerations, Virtual Memories, Memory Management requirements, Secondary Storage. **Large Computer Systems:** Forms of Parallel Processing, Array Processors, Structure of general purpose multiprocessors, Program parallelism and shared variables.

Text Books:

1. Carl Hamacher, ZvonkoVranesic, SafwatZaky, "Computer Organization", 5th Edition, McGrawHill Education Edition 2011.
2. Yu-chengLiu, Glenn A.Gibson, "Microcomputer Systems: The 8086/ 8088 Family", 2nd Edition, PHI Learning 2011.

Suggested Reading:

1. M. M. Mano, "Computer System Architecture", 3rd edition, Prentice Hall, 1994.
2. William Stallings, "Computer Organisation and Architecture, Design for Performance", Pearson, 9th Edition, 2013.
3. Douglas Hall. "Microprocessor and Interfacing programming and Hardware", Tata McGraw Hill, Revised 2nd Edition, 2007.
4. Brey B.Brey, "The Intel Microprocessor, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro-Processors-Architecture, Programming and interfacing", 4thEdition, Prentice Hall.

18CSC13

DATABASE MANAGEMENT SYSTEMS

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Pre-requisites: Discrete mathematics of computer science, Programming and data structures.

Course Objectives: The objectives of this course are

1. To become familiar with fundamental concepts of database management. These concepts include aspects of database design, database languages and database-system implementation.
2. To understand about data storage techniques and indexing.
3. To impart knowledge in transaction management, concurrency control techniques and recovery procedures.

Course Outcomes: On Successful completion of this course, student will be able to

1. Explain the fundamental concepts of database management system.
2. Design a database using ER modeling and develop complex queries using SQL and PL/SQL.
3. Apply normalization techniques on databases.
4. Explain the ACID Properties of transactions and apply the serializability tests.
5. Solve problems using various indexing and hashing techniques and various database recovery techniques.

UNIT - I

Introduction : Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Design, Specialty Databases, Data Storage and Querying, Database Users and Administrators Database System Architecture, Application Architectures. **Database Design and E-R Model:** Overview of the Design Process, Data Models, The E-R Model, Constraints, E-R Diagrams, E-R Design Issues, Extended E-R Features, Reduction to Relation Schemas, Other Aspects of Database Design.

UNIT - II

Relational Model: Structure of Relational Databases, Database Schema, Keys, Relational Algebra, Fundamental Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Modification of the Database. **Structured Query Language:** Overviews, SQL Data Types, Basic Structure of SQL Queries, Modification of the Database, Set Operations, Aggregate Functions, Data-Definition Language, Integrity Constraints, Null Values, Nested Sub Queries, Views, Join Expression. Triggers, Index Definition in SQL, Procedures and Functions in SQL, Recursive Queries, JDBC, ODBC, Embedded SQL.

UNIT - III

Relational Database Design: Undesirable Properties in Relational Database Design, Functional Dependencies, Basic Definitions, Trivial and Nontrivial Dependencies, Closure of Set of Functional Dependencies, Closure of Set of Attributes, Irreducible Set of Functional Dependencies, Non-loss Decomposition and Functional Dependencies, Normalization – 1NF, 2NF, and 3NF, Dependency Preservation, BCNF, Comparison of BCNF and 3NF, Multi-valued Dependencies. **Indexing**: Overview of Indexes, Properties of Indexes, Tree-Structured Indexing, Indexed Sequential Access Method (ISAM), B+ Tree Index Files, Bitmap Indices.

UNIT - IV

Hashing: Static Hashing, Dynamic Hashing - Extendible Hashing, Linear Hashing. **Transaction Management and Concurrency Control:** Transaction Concept – ACID Properties, States of Transaction, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularity.

UNIT - V

Deadlocks: Deadlock Prevention, Deadlock Detection and Recovery, Performance of Lock-Based Concurrency Control, Specialized Locking Techniques – Dynamic Databases and the Phantom Problem. Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES Recovery Method, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, "Database System Concepts", Sixth Edition, McGraw-Hill International Edition, 2011.
2. Date CJ, Kannan A, Swamynathan S, "An Introduction to Database Systems", Eight Editions, Pearson Education, 2006.
3. Raghu Ramakrishnan, Johnnes Gehrke, "Database Management Systems", Third Edition, McGraw Hill, 2003.
4. Ramez Elmasri, Durvasul VLN Somayazulu, Shamkant B Navathe, Shyam K Gupta, "Fundamentals of Database Systems", Fourth Edition, Pearson Education, 2006.

Suggested Reading:

1. J.D.Ullman, "Principles of Database Systems", Galgotia.

Online Resources:

1. http://www.nptelvideos.in/2012/11/database-management-system.html

18EGM01

INDIAN CONSTITUTION

(Common to all branches)

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	50 Marks
Credits	0

Course Objectives: The objectives of this course is to enable the students.

1. To understand The history of Indian Constitution and how it reflects the social, political and economic perspectives of the Indian society.
2. To Address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indiannationalism.
3. To Have knowledge of the various Organs of Governance and Local Administration.

Course Outcomes: On Successful completion of this course, student will be able to

1. Understand the making of the Indian Constitution and its features.
2. Have an insight into various Organs of Governance - composition and functions.
3. Understand powers and functions of Municipalities, Panchayats and Co-operativeSocieties.
4. Be aware of the Emergency Provisions in India.
5. Understand the Right To equality, the Right To freedom and the Right To Liberty.

UNIT - I

Constitution of India - Introduction and salient features. Constitutional history. Directive Principles of State Policy - Its importance and implementation.

UNIT - II

Union Government and its Administration - Structure of the Indian Union: Federalism, distribution of legislative and financial powers between the Union and the States. Parliamentary form of government in India. President: role, power and position.

UNIT - III

Emergency Provisions in India - National emergency, President rule, Financial emergency.

UNIT - IV

Local Self Government - District's Administration Head: Role and Importance. Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Panchayati Raj: Introduction, Zilla Panchayat, Elected officials and their roles, CEO Zilla Panchayat: Position and role. Block level: Organizational Hierarchy (Different departments). Village level: Role of Elected and officials.

UNIT - V

Scheme Of The Fundamental Rights & Duties: Fundamental Duties - the legal status. **Scheme Of The Fundamental Rights -** To Equality, to certain Freedom Under Article 19, to Life And Personal Liberty Under Article 21.

Text Book / Suggested Reading:

1. The Constitution of India, 1950 (Bare Act), GovernmentPublication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar, Framing of Indian Constitution, 1st Edition,2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis,2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis,2015.

Online Resources:

1. http://www.nptel.ac.in/courses/103107084/Script.pdf

18ECC35

BASIC ELECTRONICS LAB

Instruction	2 Hours per week
Duration of End Examination	2 Hours
Semester End Examination	35 Marks
Continuous Internal Evaluation	15 Marks
Credits	1

Prerequisite: Knowledge about semiconductor physics and basic electrical engineering.

Course Objectives: The objectives of this course are

1. Learn about various electronic components and devices.
2. Study the transistor characteristics in different modes.
3. Learn about oscillators and amplifiers.

Course Outcomes: On Successful completion of this course, student will be able to

1. Familiarize on basic electronic components, devices and system.
2. Analyze the measurements of time period, amplitude and phase of different waveforms.
3. Design and analyze the behavior of the regulator and rectifier.
4. Develop various types of oscillators and power amplifiers
5. Design the various circuits using operational amplifiers.

LIST OF EXPERIMENTS:

1. Study of Electronic components.
2. Characteristics of Semiconductor diodes (Ge, Si and Zener).
3. CRO and its Applications.
4. Half, Full wave rectifiers with and without filters.
5. Voltage Regulator using zener diode.
6. Characteristics of BJT in CE Configuration.
7. Characteristics of FET in CS Configuration.
8. Amplifier with and without feedback.
9. RC Phase shift oscillator
10. Operational Amplifier and its applications.
11. Power Amplifiers Characteristics
12. Realization of Half and Full adder

Text Books:

1. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, a Text - Lab Manual", 7th Edition, TMH, 1994.
2. Paul B. Zbar, "Industrial Electronics, a Text - Lab Manual", 4th Edition, 2008.

18CSC14

COMPUTER ARCHITECTURE AND MICRO PROCESSOR LAB

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	50 Marks
Continuous Internal Evaluation	25 Marks
Credits	1.5

Pre-requisites: Digital Electronics and Logic Design, Computer Architecture.

Course Objectives: The objectives of this course are

1. To become familiar with the architecture and Instruction set of 8086 microprocessor.
2. To provide practical hands on experience with Assembly Language Programming.
3. To provide solid foundation on interfacing the external devices to the processor according to the user requirements to create novel products and solutions for the real time problems.

Course Outcomes: On Successful completion of this course, student will be able to

1. Describe the architecture and comprehend the instruction set of 8086.
2. Understand and apply the principles of Assembly Language Programming in developing microprocessor based applications.
3. Get familiarized with different assembly language software tools.
4. Work with standard microprocessor interfaces to know how a processor will communicate with the External world.
5. Design and develop of various Embedded Applications.

LIST OF EXPERIMENTS:

1. Examining and understanding the working nature of internal components of computer like North bridge and South bridge of mother board, Memories like cache, ROM, RAM, Secondary storage devices, understanding CMOS and analyzing configuration using inbuilt or external tools.
2. Implementation of 2's complement to represent signed numbers in C/ Java/Python for a user specified bit length like 8/16 bit.
3. Implementation of Booth's Binary Multiplication algorithm in C/Java/ Python.

4. Implementation of Non restoring Division algorithm in C/Java/Python.
5. Tutorials with 8086 kit / MASM / NASM software tool.
6. Addition of 32-bit numbers using 16-bit registers.
7. Fixed-point multiplication and division.
8. Sorting hexadecimal array.
9. Code conversion from hexadecimal to decimal.
10. Packed and Unpacked BCD numbers.
11. Sum of set of BCD numbers.
12. Searching.
13. Display a string of characters using 8279.

Suggested Reading:

1. Yu-cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086/ 8088 Family", 2nd Edition, PHI Learning 2011.
2. Douglas Hall. "Microprocessor and Interfacing programming and Hardware", Tata McGraw Hill, Revised 2nd Edition, 2007.
3. Brey B. Brey, "The Intel Microprocessor, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro-Processors-Architecture, Programming and interfacing", 4th Edition, Prentice Hall, 1993.

18CSC15

DATABASE MANAGEMENT SYSTEMS LAB

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	50 Marks
Continuous Internal Evaluation	25 Marks
Credits	1.5

Course Objectives: The objectives of this course are

1. To become familiar with the concepts of structured query language.
2. To understand about programming language / structured query language (PL/SQL).
3. To become familiar with generation of form and open database connectivity.

Course Outcomes: On Successful completion of this course, student will be able to

1. Apply the built-in functions and write simple queries on various databases.
2. Perform definition and manipulation of data using SQL commands.
3. Develop complex queries using joins and nested queries.
4. Add constraints on Databases implement DCL, TCL and advanced SQL commands.
5. Develop programs using cursors, triggers, exceptions, procedures and functions in PL/SQL.

LIST OF EXPERIMENTS:

SQL:

1. Queries using Built-In functions, like aggregate functions, String Functions, Numeric Functions, Data Functions, Conversion Functions and other miscellaneous.
2. Queries using operators in SQL.
3. Queries to Retrieve and Change Data: Select, Insert, Delete and Update.
4. Queries using Group By, Order By and Having Clauses.
5. Queries on Controlling Data: Commit, Rollback and Save point.
6. Queries to Build Report in SQL *PLUS.
7. Queries for Creating, Dropping and Altering Tables, Views and Constraints.
8. Queries on Joins and Correlated Sub-Queries.

9. Queries on Working with Index, Sequence, Synonym, Controlling Access and Locking Rows for Update, Creating Password and Security features.

PL/SQL:

10. Write a PL/SQL code using Basic Variable, Anchored Declarations and Usage of Assignment Operation.
11. Write a PL/SQL code Bind and Substitution Variables, Printing in PL/SQL.
12. Write a PL/SQL block using SQL and Control Structures in PL/SQL.
13. Write a PL/SQL code using Cursors, Exception and Composite Data Types.
14. Write a PL/SQL code using Procedures, Functions and Packages.

Note: The creation of sample database for the purpose of the experiments is expected to be pre-decided by the instructor.

Text Books / Suggested Reading:

1. "Oracle: The complete Reference", by Oracle Press.
2. Nilesh Shah, "Databse Systems Using Oracle", PHI, 2007.
3. Rick F Van der Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007.

18CSC16

IT WORKSHOP (Latex/Scilab)

Instruction	2P +1THours per week
Duration of End Examination	3 Hours
Semester End Examination	50 Marks
Continuous Internal Evaluation	25 Marks
Credits	2

Course Objectives: The objectives of this course are:

1. Familiarize the students with documentation and visualization tools like Latex and Scilab.
2. Development of proficiency in documentation for presentation and report writing.
3. Explore the utilities in Latex and Scilab.

Course Outcomes: On Successful completion of this course, student will be able to:

1. Understand the need of documentation tools.
2. Install the documentation tools.
3. Generate templates for lab report using Latex.
4. Generate templates for presentation using Beamer.
5. Explore the utilities of Scilab.

LIST OF EXPERIMENTS:

1. Installation of Latex and Scilab.
2. Understanding Latex compilation, basic syntax, writing of equations, matices, tables.
3. Page Layout –Titles, abstract chapters, sections, references, equation references, citation, table of contents, generating new commands, figure handling, numbering, list of figures, list of tables, generating index.
4. Packages: Geometry, hyperref, amsmath, amssymb, algorithms, algorithmic graphic, color, tiles listing.
5. Understanding of Classes: article, book, report, beamer, slides.
6. Writing Resume, question paper, articles, research papers, Presentation using beamer.
7. Basic syntax, Mathematical Operators, Predefined constants, Built in functions.
8. Programming -Functions -Loops -Conditional statements -Handling .sci files.

9. Graphics handling-2D, 3D -Generating .jpg files, function plotting, data plotting.
10. Solving linear equations, Eigen values and numerical Analysis – iterative methods, ordinary differential equation, plotting solution curves,
11. Comparison OS Scilab with C / C++/ Matlab.

Text Books / Suggested Reading / Online Resources:

1. https://www.latex-project.org/help/documentation/
2. https://spoken-tutorial.org/tutorialsearch ?search_foss=LaTeX&search_language=English
3. https://www.scilab.org/sites/default/files/Scilab_beginners_0.pdf
4. https://www.scilab.org/tutorials\