With effect from the academic year 2015-16

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

II/IV B.E I & II SEMESTER SCEHME AND SYLLABI
With effect from the academic year 2015-16

DEPARTMENT VISION

To be a center for imparting Computer Science and Engineering education and to serve as a valuable resource for the industry and society

DEPARTMENT MISSION

To enable the students to develop logic and problem solving approach to help build their careers in the field of computing and provide creative solutions for the benefit of the society.

COLLEGE VISION

Striving for a symbiosis of technological excellence and human values

COLLEGE MISSION

To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II YEAR- I-SEMESTER

S. No.	Sllabus Ref. No.	SUBJECT	Scheme of Instruction				Scheme of Examination			Credits
			Periods per Week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM. Exam	Sessionals	
	THEORY									
1.	MA 2010	Mathematics – III	4	-	-	-	3	70	30	3
2.	CS 2020	Data Structures	4	-	-	-	3	70	30	3
3.	CS 2030	Discrete Structures	4	-	-	-	3	70	30	3
4.	CS 2040	Logic and Switching Theory	4	1	-	-	3	70	30	3
5.	CS 2050	Computer Architecture	4	-	-	-	3	70	30	3
6.	EC 2130	Basic Electronics	4	1	-	-	3	70	30	3
7	HS 2140	Human Values & Professional Ethics	2	-	-	-	3	70	30	1
8	HS 2160	Finishing School-I	2	-	-	-	3	70	30	2
	PRACTICALS									
1.	CS 2071	Data Structures Lab	-	-	-	3	3	50	25	2
2.	EC 2391	Basic Electronics Lab	-	-	-	3	3	50	25	2
		Total	**28**			**6**	-	**660**	**290**	**25**
								950		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD-31
SCHEME OF INSTRUCTION & EXAMINATION
2/4 B.E. Bridge Course (for Lateral Entry Students of all branches)
With effect from the academic year 2015-16

I-Semester

S No.	Code	Subject	Scheme of Instruction				Scheme of Examination			
			Periods per week				Duration	Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
Theory										
1	MA2040	Mathematics	1	-	-	-	90 min	25	-	-
2	PH2130	Physics of materials	1	-	-	-	90 min	25	-	-
3	CE2080	Engineering Mechanics	2	-	-	-	3 hrs	50	-	-
Practicals										
4	CS 2091	C-Programming Lab	-	-	-	2	3 hrs	50	-	-
			4	**-**	**-**	**2**	**-**	**150**	-	-
II-Semester										
Practicals										
1	HS2231	ELT-LAB	-	-	-	2	3	50	-	-

No credits are awarded to the bridge courses offered to 2/4 B.E (all branches) lateral entry students taking admissions from the academic year 2015-16 under autonomous status. However pass in each of these courses is mandatory to obtain the degree. Every student shall get 40% marks in each course for a pass in theory subject and 50% marks in laboratory course. Only semester examinations will be conducted at the end of the each semester.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderabad-500031
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS FOR BE 2/4 FIRST SEMESTER
Mathematics –III

Instruction: 4Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **MA 2010**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVES	COURSE OUTCOMES
Students should	Students will be able to
1. Understand the basics of Fourier series, partial differential equations, applications of partial differential equations in one dimensional wave, heat and Laplace equations 2. Study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications 3. Study the fundamentals of probability, statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications	1. Understand the basics of Fourier series, partial differential equations. Applications of partial differential equations in one dimensional wave, heat and Laplace equations 2. Understand study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications 3. Understand the fundamentals of probability, statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications

UNIT-I : **Fourier Series:** Introduction to Fourier series – Conditions for a Fourier expansion – Functions having points of discontinuity – Change of Interval - Fourier series expansions of even and odd functions - Fourier Expansion of Half- range Sine and Cosine series.

UNIT-II: **Partial Differential Equations and its Applications:** Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange's Equation, Non-linear first order equations - Charpit's method

Applications of Partial Differential Equations: Method of Separation of Variables - Solution of One **D**imensional Heat Equation - One Dimensional Wave Equation - Laplace's Equation.

UNIT-III: Numerical Methods: Solution of Algebraic and Transcendental equations**-**Bisection method - Regula Falsi method- Newton-Raphson Method - Solution of Linear System of Equations - Gauss- Seidel Iteration Method – Interpolation- Newton's Forward and Backward Interpolation Formulae - Lagrange's Interpolation Formula - Newton's Divided Difference Formula - Numerical Differentiation - Interpolation approach- Numerical Solutions of Ordinary Differential Equations - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4^{th} order(without proofs).

UNIT-IV: Probability and Statistics: Random variables – Discrete Probability Distribution – Continuous Probability Distribution - Expectation – Variance – Moments -Moment Generating Function- Poisson and Normal Distributions – Testing of Hypothesis - Tests of Significance - t-test - F- test – x^2 - test for small samples.

UNIT-V: Curve Fitting: Curve Fitting by the Method of Least Squares**,** Fitting of Straight line – Parabola - Exponential Curves- Correlation – Karl Pearson's Co-efficient of Correlation - Spearman's Rank Correlation, Regression - Lines of Regression.

Learning Resources :

1. Jain R.K. & lyengar S.R.K., *Advanced Engineering Mathematics*, Third Edition, Narosa Publications, 2007.
2. Grewal B.S, *Higher Engineering Mathematics*, 40^{th} Edition, Khanna Publishers.
3. Grewal B.S, *Numerical Methods*, Khanna Publishers.
4. Gupta & Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.
5. Kreyszig E, *Advanced Engineering Mathematics,* 8^{th} Edition, John Wiley & Sons Ltd, 2006.
6. Bali N.P. & Manish Goyal, *A text book of Engineering Mathematics,* Laxmi Publication.
7. Sastry S.S., *Numerical Analysis*, PHI Learning Ltd.

SYLLABUS FOR 2/4 BE FIRST SEMESTER
DATA STRUCTURES

Instruction: 4Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **CS 2020**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Identify and use appropriate data structure for a given problem with effective utilization of space and time.	1. Analyze time and space complexity of algorithms and use different linear data structures to solve problems. 2. Apply stack and queue data structures to solve computer science and engineering problems and compare different hashing techniques. 3. Choose the appropriate tree data structure and demonstrate ability to perform various operations on them for solving a given problem. 4. Demonstrate the properties of a graph and their applications. 5. Choose appropriate sorting techniques to maximize the performance.

UNIT - I

Performance and Complexity Analysis: Space Complexity, Time Complexity, Asymptotic Notations (Big-Oh), Complexity Analysis Examples.

Linear List - Array Representation: Array Representation, Vector Representation, Multiple Lists in a Single Array.

Linear List - Linked Representation: Singly Linked Lists, Circular Lists and Header Nodes, Doubly Linked Lists, Applications

Arrays and Matrices: Row and Column Major Representations, Special Matrices, Sparse Matrices, String Matching.

UNIT – II

Stacks: Array Representations, Linked Representations, Applications

Queues: Array Representations, Linked Representations, Applications

Skip List and Hashing: Skip List Representation, Hash Table Representation.

UNIT – III

Trees: Tree Definitions and Properties, Representations of Binary Trees, Operations, Binary Tree Traversal, Binary Search Trees: Definitions, Operations and Implementation of Binary Search Trees.

Balanced Search Trees: AVL Trees, Red Black Trees, Splay Trees, B-Trees.

UNIT – IV

Graphs: Definitions and Properties, Representations, Graph Search Methods (DFS and BFS), Applications of Graphs: Shortest Path Algorithms (Dijkstra's) Minimum Cost Spanning Trees (Prim's and Kruskal's Algorithms).

UNIV – V

Sorting and Complexity Analysis: Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Closest Pair of Points, Heap Sort.

Learning Resources:

1. Sartaj Sahani, *Data Structures Algorithms and Applications in C++,* Second Edition, Universities Press (India) private limited, 2005.
2. Mark Allen Weiss, *Data Structures and problem solving using C++,* Second Edition, Addison-Wesley, 2000.
3. Michel Goodrich, Roberto Tamassia, David Mount, *Data structures and algorithms in C++,* Wiley India Pvt. Ltd, 2004.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, *Introduction to Algorithms,* Third Edition, MIT Press, 2009.
5. Yedidyah Langsam, Moshel J.Augenstein, Aaron M Tenenbaum, *Data Structures Using C and C++* , Second Edition, PHI, 2009

SYLLABUS FOR BE 2/4 FIRST SEMESTER
DISCRETE STRUCTURES

Instruction: 4Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **CS 2030**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hr

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Apply programming logic and choose relevant mathematical model for solving real world problems.	1. construct compound statements using logical connectives and verify the validity of conclusion using inference rules 2. compare different types of relations and functions and also apply principle of inclusion and exclusion to solve counting problems 3. describe recurrence relations to find the complexity of an algorithm 4. explain the properties of graphs, trees and construct minimal spanning trees for weighted graphs. 5. define monoid, semi group, group, homomorphism and apply group codes for error detection and correction

UNIT – I

Fundamentals of Logic: Basic Connectives and Truth Tables, Logical Equivalence, Logical Implication, Use of Quantifiers, Definitions and the Proof of Theorems.

Properties of the Integers: The well – ordering principle, Recursive definitions, The division algorithms, The Greatest Common Divisor, The Fundamental theorem of arithmetic.

UNIT – II

Functions: Cartesian product, One-to-one, Onto Functions, Special Functions, Pigeonhole Principle, Composition and Inverse Functions.

Relations: Partial Orders, Equivalence Relations and Partitions.

Principle of Inclusion and Exclusion: Principles of Inclusion and Exclusion, Generalizations of Principle, Derangements, Rook Polynomials, Arrangements with Forbidden Positions.

UNIT – III

Generating Functions: Introductory Examples, Definition and Examples, Partitions of Integers, Exponential Generating Function, Summation Operator.

Recurrence Relations: First – Order Linear Recurrence Relation, Second – Order Linear Homogenous Recurrence Relation with Constant Coefficients, Non Homogenous Recurrence Relation.

UNIT – IV

Graph Theory: Definitions and Examples, Sub graphs, Complements and Graph Isomorphism, Vertex Degree, Planar Graphs, Hamiltonian Paths and Cycles, Graph Coloring.

Trees: Definitions, Properties and Examples, Rooted Trees, Spanning Tress and Minimum Spanning Trees.

UNIT – V

Algebraic Structures: Algebraic System – General Properties, semi groups, Monoids, Homomorphism, Cosets and Lagrange's Theorem, Elements of Coding Theory, The Hamming Metric, The Parity Check generating Matrices, Group Codes: Decoding with Coset Leaders.

Learning Resources:

1. Ralph P. Grimaldi, *Discrete and Combinatorial Mathematics*, 4th edition, Pearson Education, 2003.
2. Kenneth H Rosen, *Discrete mathematics and its applications,* 5th edition, Tata McGraw-Hill Edition, 2006.
3. J.P. Tremblay, R. Manohar, *Discrete Mathematical Structure with Applications to Computer Science*, McGraw Hill, 1987.
4. Joe L. Mott, A. Kandel, T.P. Baker, *Discrete Mathematics for Computer Scientists & Mathematicians*, Prentice Hall N.J., 1986.
5. Thomas Koshy, *Discrete Mathematics with Applications*, Elsevier Inc.2004.

SYLLABUS FOR BE 2/4 FIRST SEMESTER
LOGIC AND SWITCHING THEORY

Instruction: 4+1 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **CS 2040**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Describe components of digital system and design combinational and sequential circuits.	1. Perform binary arithmetic and represent the Boolean functions in standard forms. 2. Implement digital circuits by minimizing Boolean functions 3. Design combinational circuits 4. Design sequential circuits 5. Design counters and registers

UNIT-I

Digital Computers and Information: Information representation, Computer Structure.

Number Systems: Binary Numbers, Octal and Hexadecimal Numbers, Number Ranges.

Arithmetic Operations: Conversion from Decimal to other bases.

Decimal Codes: BCD Addition. Alphanumeric Codes, ASCII Character Code, Parity Bit.

Binary Logic and Gates: Binary Logic, Logic Gates. Boolean algebra, Basic Identifiers, Algebraic Manipulation, Complement of a Function.

Standard Forms: Minterms and Maxterms, Sum of Product and Products of Sums.

UNIT-II

Minimization of Switching Functions: Introduction, Map method, Tabulation procedure, Prime implicant chart, don't care conditions

NAND and NOR Gates: Nand Circuits, Two-level, Implementation Multilevel NAND Circuits, NOR Circuits. Exclusive OR Gates, Odd Function, Parity Generation and Checking.

Integrated Circuits: Levels of integration, Digital Logic Families, Positive and Negative logic, Transmission gates

UNIT-III

Combinational Logic Design: Combinational Circuits, Design Topics, Design Hierarchy, Top –Down design, Computer Aided Design, HDL
Analysis Procedure: Derivation of Boolean Functions, Derivation of the Truth Table, Logic Simulation

Design Procedure: Code Converters, Decoders, Encoders, Multiplexers, Binary Adders, Binary subtraction, Binary Multipliers

UNIT-IV

Sequential Circuits: Sequential Circuit definitions, Latches, Flip Flops, Characteristic Tables, Sequential circuit analysis, Sequential circuit design, Design with D Flip Flops, designing with JK Flip- Flops

UNIT-V

Registers and Counters: Registers, Shift registers, Ripple Counter, Synchronous Binary counters, other counters: BCD Counter, Arbitrary count sequence

Learning Resources:

1. M.Morris Mano, Charles R. Kime, *Logic and Computer Design Fundamentals,* Second Edition, Pearson Education, 2004.
2. ZviKohavi, *Switching and Finite Automata Theory,* Tata McGraw Hill, Second Edition, 1978.
3. Charles H. Roth, Jr., Larry L. Kenny, *Fundamentals of Logic Design*, Cengage Learning, Seventh Edition, 2013.
4. A. Anand Kumar, *Switching Theory and Logic Design*, PHI Publishers, Second Edition, 2014
5. CH Roth, *Fundamentals of Logic Design*, Jaico Publishers, 1998.

SYLLABUS FOR2/4 BE FIRST SEMESTER
COMPUTER ARCHITECURE

Instruction: 4+1 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **CS 2050**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Describe the structure and behavior of various functional modules of a computer and demonstrate how they interact to provide the processing needs of the user.	1. Describe major components of a computer including CPU, memory, and I/O. 2. Discuss organization and design of a digital computer. 3. Explain control memory, internal organization, and instructions of CPU 4. Discuss the techniques used by a computer to communicate with I/O devices. 5. Explain the concepts, operation and organization of memory and evaluate the performance of a CPU

UNIT-I

Data Representation: Data Types, Complements, Fixed Point Representations and Floating Point Representations, Other Binary Codes.

Overview of Computer Function and Interconnection: Computer Components, Interconnection Structures, Bus Interconnection, Bus Structure, Data Transfer.

UNIT-II

Register Transfer Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic, Logic, Shift Microoperations, Arithmetic Logic Shift Unit.

Basic Computer organization and Design: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instruction, Input-Output and Interrupt.

UNIT-III

Microprogrammed Control: Control memory, Address Sequencing, Microprogram Example, Design of Control Unit.

Central Processing Unit: General Register organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC.

Computer Arithmetic: Addition and Subtraction, Multiplication, Division, Floating Point Arithmetic Operations, Decimal Arithmetic Unit.

UNIT-IV

Input-Output organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor (IOP), Serial Communication.

UNIT-V

Memory Organization: Memory Hierarchy, Main Memory, RAM and ROM, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

Assessing and Understanding Performance: CPU Performance and its Factors, Evaluating Performance.

Learning Resources:

1. M.Morris Mano, *Computer System Architecture*, 3rd Edition, Pearson Education Asia, 2002.
2. William Stallings, *Computer Organization & Architecture*, 6th Edition, Pearson Education Asia, 2003.
3. David A Patterson, John L Hennessy, *Computer Organization and Design*, Morgan Kaufmann, 2010.
4. V.Carl Hamacher, Z.G. Vranesic, S.G. Zaky, *Computer Organization*, McGraw Hill, 2004.
5. Pal Chaudhuri,P., *Computer Organization and Design*, Prentice Hall of India, 3rd Edition 2009.

SYLLABUS FOR 2/4 BE FIRST SEMESTER
BASIC ELECTRONICS

Instruction: 4+1 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2130**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Acquire the knowledge of various electronic devices and their applications.	1. Employ different electronic devices to build electronic circuits such as rectifiers, amplifiers, voltage regulators and oscillators. 2. Implement digital circuits such as adders and subtractors using logic gates. 3. Convert real time signals into corresponding electrical signals using different types of transducers.

UNIT - I

Semiconductor Theory: Classification of semiconductors, Energy Levels, Conductivity, Mobility, Diffusion and Drift currents, Hall Effect, Characteristics of P-N Junction diode, Parameters and Applications. **Rectifiers:** Half wave and Full wave Rectifiers (Bridge, center tapped), ripple factor and efficiency, comparison of rectifiers, Filters, types of filters, Rectifiers with and without filters

UNIT - II

Transistors: Bipolar Junction Transistor, Construction, Types, Working principle, Configurations, Transistor parameters, Transistor as an amplifier, Problems, h-parameter equivalent circuits. Field effect transistor, Construction and working of JFET, Parameters and applications of JFET, Types of MOSFET (depletion and enhancement), Comparison of BJTs with JFETs; **Regulators:** Characteristics of Zener Diode, Voltage Regulation, Zener diode as voltage regulator, IC voltage regulators.

UNIT - III

Feedback Concepts – Basic concept of feedback, Types of feedback, Feedback topologies, General characteristics of Negative feedback amplifiers; **Oscillators** – Classification of Oscillators, Types, LC Type and RC Type Oscillators and Crystal Oscillators (Qualitative treatment only)

UNIT - IV

Operational Amplifiers – Introduction, Characteristics of ideal Operational amplifier, Operational amplifier stages, Parameters, Open loop and closed loop configurations, Applications (Adder, Subtractor, Voltage follower, Integrator, Differentiator, Instrumentation Amplifier); **Digital circuits:** Boolean Algebra, Logic Gates, Combinational circuits such as half and full adders, half and full subtractors.

UNIT - V

Data Acquisition systems: Introduction, Classification of transducers, Capacitive transducer, Inductive transducer, LVDT, Electrical strain gauges, Temperature transducers (Thermocouple), Piezoelectric transducer, Photoelectric transducer; **Photo Electric Devices:** Photo diode, Photo Transistor, LED, LCD; **Industrial Devices:** SCR, TRIAC, DIAC, UJT - Construction, Working principle and Characteristics only; **Display Systems:** Constructional details of C.R.O and Applications.

Suggested Reading :

1. S.Shalivahan, N. Suresh Kumar, A Vallavea Raj, *Electronic Devices and Circuits*, Tata McGraw Hill, 2003.
2. Jacob Milman & C., Halkias, *Electronic devices*, 8th Edition, Reprinted, Mc Graw Hill, 1985.
3. Ramakanth A. Gayakwad, *Op-AMPS and Linear Integrated Circuits*, 3rd edition, Prentice Hall of India, 1985.
4. Mooris Mano, *Digital design*, 3rd edition, Prentice Hall of India, 2002.
5. Cooper, *Electronic Measurement and Instrumentations*.

SYLLABUS FOR 2/4 BE FIRST SEMESTER
DATA STRUCTURES LAB

Instruction: 3 Periods/Week	Sem Exam Marks: 50	Subject Reference Code : **CS 2071**
Credits : 2	Sessional Marks: 25	Duration of Sem Exam:3Hrs

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Identify and implement appropriate data structure for a given problem with effective utilization of space and time.	1. Implement various operations on array and linked list. 2. Develop applications using stack and queue to demonstrate the linear data structures 3. Implement operations on various trees and develop applications 4. Implement operations on graph and develop applications 5. Implement different sorting algorithms and suggest optimized sorting technique for the given data set

Programming exercise using C++ for the following:

1. Implementation of Singly Linked List, Doubly Linked List and Circular Linked List.
2. Polynomial Arithmetic using Linked List.
3. Implementation of String Matching algorithms.
4. Implementation of Stacks, Queues.(Using both Arrays and Linked Lists)
5. Infix to Postfix Conversion, Evaluation of Postfix Expression.
6. Implementation of Binary Search and Hashing, Skip Lists.
7. Implementation of Recursive and Iterative Traversals on Binary Tree.
8. Implementation of Binary Search Tree.

9. Implementation of Operations on Binary Tree (Delete Entire Tree, Copy Entire Tree, Mirror Image, Level Order, Search for a Node etc.)
10. Implementation of operations on AVL Trees.
11. Implementation of B-Trees.
12. Implementation of Traversal on Graphs.
13. Implementation of Shortest path Algorithm.
14. Implementation of Selection, Merge, Quick, Heap, and Insertion Sort.

Learning Resources:

1. Sartaj Sahani, *Data Structures Algorithms and Applications in C++,* Second Edition, Universities Press (India) private limited, 2005.
2. Mark Allen Weiss, *Data Structures and problem solving using C++,* Second Edition, Addison-Wesley, 2000.
3. Michel Goodrich, Roberto Tamassia, David Mount, *Data structures and algorithms in C++,* Wiley India Pvt. Ltd, 2004.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, *Introduction to Algorithms,* Third Edition, MIT Press, 2009.
5. Yedidyah Langsam , Moshe J. Augenstein ,Aaron M. Tenenbaum, *Data Structures Using C and C++* , Second Edition, PHI, 2009

SYLLABUS FOR 2/4 BE FIRST SEMESTER
BASIC ELECTRONICS LAB

Instructions : 3 Periods / Week	Sem Exam Marks : 50	Subject Reference Code : **EC 2391**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam :3Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to	Students will be able to
verify the characteristics of various electronic devices and circuits.	1. Verify input/output characteristics of active devices and to compute their parameters. 2. Perform operations such as addition, subtraction, comparison of voltage levels using operational amplifier. 3. Implement digital adders and subtractors using logic gates.

1. Characteristics of Semiconductor (Si and Ge) and Zener diodes
2. CRO Applications
3. Full wave rectifier with and without filter
4. Zener Voltage Regulator
5. Characteristics of BJT (CB and CE)
6. Characteristics of FET
7. Amplifier with and without feedback
8. RC Phase shift oscillator
9. Hartley oscillator and Calpitt's Oscillator
10. Applications of Operational Amplifier: Adder, Subtractor, Comparator.
11. Verifications of Logic gates
12. Realization of Half and Full adder

Learning Resources:

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, 3rd Edition, TMH, 1983.

General Note:

a) **Mini Project cum design exercise:** The students must design, rig-up, and test the circuits wherever possible and should carry out the experiments individually.

SYLLABUS FOR BE 2/4 - FIRST SEMESTER
Human Values & Professional Ethics

Instruction : 2 Periods per week	Semester Exam Marks :70	Subject Reference Code **HS 2140**
Credits : 1	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	Course Outcomes
In this subject the students will	*students will be able to*
• Get a holistic perspective of value- based education. • Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. • Understand professionalism in harmony with self and society. • Develop ethical human conduct and professional competence. • Enrich their interactions with the world around, both professional and personal	• Gain a world view of the self, the society and the profession. • Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals • Inculcate Human values into their profession. • Validate their aspirations through right understanding of human relationship and see the co-relation between the human values and prevailing problems. • Strike a balance between physical, mental, emotional and spiritual parts their being. • Obtain a holistic vision about value-based education and professional ethics

1. **The purpose of life**-Individual to society to the ideal –individual transformation as a stepping stone to idealism- the flow of transformation from individual to society – An awakened society as a basis to move towards the concept of idealism.
2. **Positive thinking-**The need, nature and scope of positive thinking-Positive thinking as a foundation to success.
3. **Character building** – Introspection and Self-analysis-identifying the desirable traits-Building of right character. Meaning of values versus skills. Self-worth and Professional worth. Professional Obligations and Competence. Work-life balance.
4. **Philosophy of Life from different cultures–value of life–Objective of life-**The Physical, Mental and Emotional aspects of man-Building an integrated personality. Ways and means to accomplish it.

5. **Different lifestyles and habits**-How they affect the basic behavior-Roadmap to a healthy lifestyle and impact on the wellbeing of an individual.
6. **Excellence-Professional & Personal ethics in society**-Goals-Striking a balance between excellence and goals and how to aim for excellence and achieve it with ethics.
7. **Potentials and harnessing potentials**-Self-Hidden potentials-Weeding out weaknesses-Channelizing the potential. Optimizing potential to achieve goals.
8. **Time Management**-Why it is essential? Impediments-how to best manage time? Benefits of effective time-management. How to make the best of the present?
9. **Environmental Protection-Human Role**- how to conserve and respect nature-Efforts to restore ecological balance –the price of progress –case studies.
10. **Impact of global development towards seeking unity in diversity** –Society as a kaleidoscope of diversity –Seeing diversity as a positive aspect of creation –Looking beyond the curtain of diversity to a common source.

Learning Resources:

1. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
2. A.N Tripathy, 2003 Human values, New Age International Publishers.
3. EG Seebauer & Robert L. Berry,2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
5. Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning
6. Caroline whitback < Ethics in Engineering Practice and Research, Cambridgs University Press
7. Georgs Reynolds, Ethics in Information Technology", Cengage Learning
8. Charles D.Fleddermann, " Engineering Ethics", Pearson Education Prentice Hall, New Jersey,2004 (Indian Reprint)
9. Value Education website, Http://www.universalhumanvalues.info

SYLLABUS FOR BE 2/4 - FIRST SEMESTER
FINISHING SCHOOL-I

Instruction : 2 Periods per week	Semester Exam Marks :70	Subject Reference Code **HS 2160**
Credits : 2	Sessional Marks :30	Duration of Sem Exam : 3 Hr

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
1. Identify the various features and functions of human language and communication. 2. Develop the habit of listening effectively so as to analyze the speaker's tone and tenor. 3. Choose the appropriate words so as to speak and write accurately. 4. Read various types of texts and sift information correctly. 5. Write notes and letters for personal and official purposes.	1. Listen and analyze context, tone and tenor before responding to others. 2. Begin, sustain and end conversation. 3. Respond to people in different situations. 4. Read with adequate speed and comprehend various texts. 5. Use words appropriately in different contexts for speaking and writing. 6. Use markers in written discourse. 7. Construct grammatically correct sentences to write effectively.

SECTION –I
Soft skills (35 Marks)

UNIT-I: ORAL COMMUNICATION: LANGUAGE FUNCTION IN CONTEXT

- Greeting People and responding to greetings
- Making and responding to introductions
- Making and responding to requests
- Making , accepting and refusing invitations
- Taking permissions
- Thanking people and responding to thanks

UNIT-II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for meaningful chunks of information
- Listening for gist and specific information

UNIT-III: READING: COMMUNICATING WITH A GIVEN TEXT

- For gist
- For details
- To target questions
- For main idea
- For supporting details to the main idea

UNIT-IV : WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Basic structures of texts
- Punctuation
- Letters
- Types of sentences

UNIT-V: GRAMMAR

- Relative clauses
- Subject verb
- Prepositions
- Common errors

VOCABULARY

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

SECTION-II

Technical skills (35 Marks)

- **C Programming**: C Compiler-Functions-Structures-Pointers-Files-String Handling-Static & Dynamic Memory Allocation, Case Study.
- **An Introduction to Python**-Installing Python-Executing Python-Functions-Variables and identifiers-Types-Condition & looping statements-Numbers-Objects-Collections-Exceptions-Modules.
- **Input Output Classes in Python**-Sample Application Development-Case Study.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II YEAR- II-SEMESTER

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction				Scheme of Examination			Credits
			Periods per Week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM Exam	Sessionals	
	THEORY									
1.	MA 2030	Mathematics – IV	4	-	-	-	3	70	30	3
2.	CS 2100	Object Oriented Programming using Java	4	-	-	-	3	70	30	3
3.	CS 2110	Microprocessors& Interfacing	4	-	-	-	3	70	30	3
4.	CS 2120	Data Communication	4	1	-	-	3	70	30	3
5.	CS 2130	Design & Analysis of Algorithms	4	1	-	-	3	70	30	3
6.	CE 2090	Environmental Studies	4	-	-	-	3	70	30	3
7.	HS 2220	Finishing School-II	2	-	-	-	3	70	30	2
	PRACTICALS									
1.	CS 2151	Java Lab	-	-	-	3	3	50	25	2
2.	CS 2161	Microprocessors & Interfacing Lab	-	-	-	3	3	50	25	2
		Total	**26**		**6**			**590**	**260**	**24**
								850		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SYLLABUS FOR BE 2/4 SECOND SEMESTER

MATHEMATICS – IV

Instructions: 4 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **MA 2030**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam: 3 Hrs.

COURSE OBJECTIVES	**COURSE OUTCOMES**
Students should be able to	Students will be able to
1. To study the Laplace transforms and Z-transforms to solve differential and difference equations. 2. To understand the concepts of fourier transforms and its applications 3. To understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, to find the real integrals using Cauchy's Residue theorem around contours also to study biliear transformations, conformal mapping	1. Understand the laplace transforms and Z-transforms to solve differential and difference equations 2. Understand the concepts of fourier transforms and its applications 3. Understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, to find the real integrals using Cauchy's Residue theorem around contours also to study biliear transformations, conformal mapping

UNIT- I

Laplace Transforms: Introduction to Laplace transforms - Inverse Laplace transform - Sufficient Condition for Existence of Laplace Transform –Properties of Laplace Transform- Laplace Transform of Derivatives - Laplace Transform of Integrals - Multiplication by t^n - Division by t – Evaluation of Integrals by Laplace Transforms- Convolution Theorem - Application of Laplace transforms to Linear Differential Equations with Constant Coefficients.

UNIT –II

Z-Transforms: Introduction - Z-transforms of Standard sequences - Linearity Property – Damping Rule - Shifting Properties- Multiplication by n - Initial and Final value theorems – Inverse Z-Transforms- Convolution Theorem – Application of Z-Transforms to Difference Equations.

UNIT-III:

Fourier Transforms: Fourier Integral Theorem - Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms - Convolution Theorem.

UNIT-IV

Functions of Complex Variables: Limits and Continuity of function - **D**ifferentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Milne-Thomson's method - Cauchy-Riemann Equations in Polar Form - Harmonic Functions - Complex Integration - Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula.

UNIT-V

Power series - Taylor's Series - Laurent's Series - Zeros and Singularities – Residues – Cauchy's Residue Theorem -Evaluation of Real Integrals using Residue Theorem -Bilinear Transformation - Conformal Mapping.

Learning Resources

1. R. K. Jain & S. R. K. Iyengar, *Advanced Engineering Mathematics*,3rd Edition, Narosa Publications
2. Dr. B. S. Grewal, *Higher Engineering Mathematics,* 40th Edition, Khanna Publishers.
3. Goyal & Gupta, *Laplace's and Fourier transforms,* 23rd Edition, Pragati Prakashan, 2009
4. Kreyszig E, Advanced Engineering Mathematics, 8 th Edition, John Wiley & Sons Ltd, 2006.
5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
6. Higher Engineering Mathematics, H.K. Dass, Er.Rajnish Verma 2011 Edition S.Chand & company Ltd.
7. R.V. Churchill, "Complex Variables & its Applications".Mc Graw-Hill Book Company, INC

With effect from the academic year 2015-16

SYLLABUS FOR 2/4 BE SECOND SEMESTER
OBJECT ORIENTED PROGRAMMING USING JAVA

Instructions: 4 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **CS 2100**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVES	COURSE OUTCOMES
Students should	Students will be able to
demonstrate the ability to apply object oriented principles for developing an application using Java	1. apply the object oriented programming paradigm and demonstrate concurrent programming and runtime error handling through java programming 2. choose appropriate classes and interfaces from Collection framework to handle set of objects 3. select input, output classes/interfaces from IO package to work with console, files and network streams 4. develop a java bean implementing event driven programming 5. develop GUI for any application using Swing framework

UNIT – I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control Statements, Classes, Methods, Inheritance, Packages and Interfaces, Exception Handling, Multithreaded Programming, String Handling.

UNIT – II

Java.lang: Type Wrapper, Process, Runtime, Object classes

Collections: Overview, Collection Interfaces, Collection Classes, Iterators, Random Access Interface, List, Set, Maps, Comparators, Arrays, Legacy Classes and Interfaces, StringTokenizer, BitSet, Date, Calendar, Observable, Timer.

UNIT – III

IO: Java I/O Classes and Interfaces, Files and Directories, Byte and Character Streams, Serialization.

UNIT – IV

GUI and event Programming: Applet Class, Applet architecture, Event Handling, The Delegation Event Model, Event Classes, Source of Events, Events Listener Interfaces, AWT: Classes, Working with Graphics.

Java Beans: Introduction, Bean Properties, Beans API, A Sample Bean.

UNIT – V

Java Swing: Basics of Swing, Difference between AWT & Swing, MVC Architecture, Components and Container, Swing Components: JLabel, JTextField, JList, JRadioButton, JCheckBox, JComboBox, JButton, JScrollPane, JTabbedPane, JTable, JToggleButton, JTree, Layout Managers.

Learning Resources:

1. Herbert Schildt, *The Complete Reference Java*, 7th Edition, Tata McGraw Hill 2005.
2. James M Slack, *Programming and Problem Solving with JAVA*, Thomson Learning 2002.
3. C Thomas Wu, *An Introduction to Object Oriented Programming with Java*, Tata McGraw Hill, 2005.
4. P. Radha Krishna, *Object Oriented Programming through Java,* Universities Press, 2007.
5. Sachin Malhotra, Saurabh Choudhary, *Programming in Java*, 2nd Edition, Oxford Press, 2014.

SYLLABUS FOR 2/4 BE SECOND SEMESTER
MICROPROCESSORS & INTERFACING

Instructions: 4 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **CS 2110**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
Describe the basics of microprocessor and microcontroller Programming and their applications	1. Understands the basic element and functions of Microprocessor. 2. Describe the architecture of microprocessor and its peripheral devices. 3. Analyze operations on interfacing devices using Microprocessor. 4. Develop assembly language programs for microprocessor applications. 5. Analyze the pin configurations of 8051 microcontroller and interface keyboard, ADC, DAC with 8051

UNIT-I

8085 Architecture: Introduction to microprocessors and microcontrollers, 8085 Processor Architecture, Internal operations, Instructions and timings, Programming the 8085 – Introduction to 8085 instructions, Addressing modes and Programming techniques with Additional instructions.

UNIT-II

Stacks and subroutines, interfacing peripherals - Basic interfacing concepts, interfacing output displays, interfacing input keyboards. Interrupts - 8085 Interrupts, Programmable Interrupt Controller (8259A). Direct Memory Access (DMA) – DMA Controller (Intel 8257), Interfacing 8085 with Digital to Analog and Analog to Digital converters.

UNIT-III

Programmable peripheral interface (Intel 8255A), Programmable communication interface (Intel 8251), Programmable Interval timer (Intel 8253 and 8254), Programmable Keyboard / Display controller (Intel 8279). Serial and parallel bus standards RS 232 C, IEEE 488.

UNIT-IV

Introduction to Microcontrollers, 8051 – Architecture – Instruction set, Addressing modes and Programming techniques. Comparison of various families of 8-bit micro controllers. System Design Techniques- Interfacing of LCD, ADC, Sensors, Stepper motor, keyboard and DAC using microcontrollers. Communication standards – serial RS232 and USB

UNIT-V

Microprocessor applications and trends in Microprocessor technology – 8-bit, 16-bit and 32-bit microprocessors. Advanced Processor Architecture – Register structure, Instruction set, Addressing modes of 8086. Features of Advanced Processors 80386, 80486, Pentium and multi-Core Processors.

Learning Resources:

1. Ramesh S Gaonkar, *Microprocessor Architecture, Programming and applications with 8085*, 5/E Prentice Hall, 2002.
2. Barry B. Brey, *The Intel Microprocessor, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium pro-processors – Architecture, Programming and interfacing*, 4 Edition, Prentice Hall 1993.
3. Kenneth Ayala, *The 8051 Microcontroller,* West publishing company.
4. Myke Predko, *Programming and Customizing the 8051 Microcontroller*, Tata McGraw-Hill, 1994.
5. Yu-Cheng Liu & Glenn A Gibson, *Microcomputer systems 8086/8088 family, Architecture, Programming and Design*- 2nd Edition-, Prentice Hall of India, 2005.

SYLLABUS FOR 2/4 BE SECOND SEMESTER
DATA COMMUNICATIONS

Instructions: 4 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **CS 2120**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
describe concepts of data and computer communications, identify the various protocols involved in Physical and Data link layers of ISO-OSI reference model.	1. Describe data communications, data encoding techniques in the Physical layer 2. Explain Bandwidth utilization methods, transmission media, switching techniques. 3. Discuss functionalities, protocols in data link layer. 4. Explain various LAN technologies 5. Discuss various Wireless LAN technologies

Unit-I

Data Communication and Networking Overview, Protocol Architectures: OSI, TCP/IP and ATM. Data transmission, Guided and Wireless transmission.
Data Encoding: digital data-digital signals, digital data-analog signals, analog data-digital signals, analog data-analog signals.

Unit-II

Multiplexing, Circuit switching and Packet switching, Digital Data Communication Techniques, Asynchronous and Synchronous transmission, DSL and ADSL.

Unit-III

Data Link Control: Error detection techniques, Interfacing.
Line configurations, Flow control, Error control, Data link control protocols, Protocol verification.

Unit-IV

Local Area Networks, LAN Technologies, MAC sub layer, CSMA/CD, Token Ring, Fiber channel, IEEE Standards, High Speed LAN: Switched, Fast, Gigabit Ethernets.

Unit-V

Wireless LAN's, 802.11 Broadband wireless, 802.16, Bluetooth, Bridge, Spanning Tree Bridge, Source Routing Bridge, Repeaters, Hubs, Switches, Routers and Gateways, Virtual LAN's.

Learning Resources:

1. William Stallings, *Data and Computer Communications*, 8th Edition, PHI, 2012.
2. Andrew S. Tanenbaum, David J.Wetherall, *Computer Networks*, 5th Edition, Pearson Education, 2012
3. Forouzan, *Data Communications and Networking*, 5 th Edition, McGraw Hill Education, 2013.
4. Fred Halsall, *Data Communications, Computer Networks and Open Systems*, 4th Edition, Pearson Education.
5. Kurose, J.F. and Ross, K.W., *Computer Networking: A Top-Down Approach Featuring the Internet*, 3rd Edition, Addison Wesley, 2004.

With effect from the academic year 2015-16

SYLLABUS FOR
DESIGN AND ANALYSIS OF ALGORITHMS
BE 2/4 SECOND SEMESTER

Instructions: 4+1 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **CS 2130**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	**COURSE OUTCOMES**
Students should	Students will be able to
analyze the asymptotic performance of algorithms and apply various algorithm design strategies to solve engineering problems.	1. Analyze time and space complexity of algorithms 2. Describe and apply the divide-and-conquer paradigm for designing an algorithm to a specific problem. 3. Describe the greedy and Dynamic programming paradigms and explain when an algorithmic design situation calls for them. 4. Describe the Back tracking and branch and bound paradigms and explain when an algorithmic design situation calls for them. 5. Differentiate between NP-complete, NP-Hard problems.

UNIT – I

Introduction: what is an algorithm, algorithm specification.

Performance analysis: space complexity, time complexity. Asymptotic notations, amortized analysis

UNIT – II

Divide and Conquer: General method, binary search, finding maximum and minimum, Merge sort, quick sort, performance measurement, Masters theorem.

The Greedy Method: The general method, Knapsack problem, Job sequencing with deadlines, minimum cost spanning trees, optimal Storage on Tapes, Optimal Merge Patterns, single Source Shortest Paths.

UNIT – III

Dynamic Programming: The general method, matrix-chain multiplication problem, multistage graph, All Pairs Shortest Paths, Optimal Binary Search Trees (OBST), 0/1 Knapsack, Reliability Design, Traveling Salesman Problem, Bi-connected Components and DFS, Longest Common Subsequence (LCS) problem.

UNIT – IV

Backtracking: General method, the 8-Queens Problem, Graph Coloring, Hamiltonian Cycles, Knapsack Problem.

Branch and Bound: The method, 0/1 Knapsack problem, Traveling Salesman problem.

UNIT – V

NP-Hard and NP-Complete problems: Basic concepts, Cook's theorem, NP-hard graph problems- clique decision problem, Node cover decision problem, NP-Hard scheduling problems- scheduling identical processors. NP-Hard code generation problems-code generation with common sub expressions.

Learning Resources:

1. Horowitz E. Sahani S: *Fundamentals of computer Algorithms*, 2nd Edition Galgotia publications.
2. Thomas H. Cormen,C.E. Leiserson,R.L. Rivest , C. Stein, *Introduction to Algorithm,* 2nd edition, MIT press,USA,2001
3. Michael T. Goodrich, Roberto Tamassia, *Algorithm Design, foundations, analysis, and internet examples*, Wiley student edition,2006.
4. Aho, Hopcroft, Ulman, *The Design and Analysis of Computer algorithms*, Pearson Education, 2000.
5. *The algorithm design manual*, Steven S.Skiena,1997, Springer.

SYLLABUS FOR
ENVIRONMENTAL STUDIES
SYLLABUS FOR BE 2/4 - SECOND SEMESTER

Instructions: 4 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **CE 2090**
Credits: 3	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to	Students will be able to
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts, energy flow in ecosystem along with the biotic and abiotic components of various aquatic ecosystems. 3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. 4. Explain the causes, effects and control measures of various types of pollutions and environmental protection acts. 5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, various types of disasters and their mitigation measures.	1. Describe the various types of natural resources. 2. Differentiate between various biotic and abiotic components of ecosystem. 3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. 4. Illustrate causes, effects, control measures of various types of environmental pollutions and environmental protection acts. 5. Explain the causes, effects of climate change, global warming, acid rain and ozone layer depletion, various types of disasters and their mitigation measures and list the methods of water conservation and watershed management.

UNIT-I : **Environmental Studies:** Definition, scope and importance, need for public awareness. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II : **Ecosystems:** Concepts of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

UNIT-III : **Biodiversity:** Genetic species and ecosystem diversity. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV : **Environmental Pollution:** Causes, effects and control measures of air pollution, water pollution, soil pollutions, noise pollution, thermal pollution and solid waste & e-waste management.

Environment Protection Act: Air, water, forest and wild life acts.

UNIT-V : **Social Aspects and the Environment:** Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid, rain, ozone layer depletion. EIA, population explosion.

Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology, disaster management cycle, and disaster management in India.

Learning Resources:

1. Deswal S. and Deswal A., *A Basic Course on Environmental studies*, Dhanpat Rai & Co Pvt. Ltd. 2004.
2. Benny Joseph, *Environmental Studies*, Tata McGraw-Hill, 2005.
3. Suresh K. Dhameja, *Environmental Studies*, S.K. Kataria & Sons, 2010.
4. De A.K., *Environmental Chemistry*, New Age International, 2003.
5. Odum E.P., *Fundamentals of Ecology,* W.B. Sunders Co., USA, 2004.
6. Sharma V.K., *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.
7. Rajagopalan R., *Environmental Studies*, Second Edition, Oxford University Press, 2013.

SYLLABUS FOR
JAVA LAB
2/4 BE SECOND SEMESTER

Instructions: 3Periods / Week	Sem Exam Marks : 50	Subject Reference Code: **CS 2151**
Credits: 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
demonstrate the ability to implement object oriented system development using Java	1. implement object oriented system development using java 2. apply various data structures for solving a use cases using Collection framework 3. implement IO programming to work with console, files and network streams 4. develop a java bean implementing event driven programming 5. develop a front end application using Java Swing framework

LIST OF PROGRAMS

1. A program to illustrate the concept of class with constructors, methods and overloading.
2. A program to illustrate the concept of inheritance and dynamic polymorphism
3. A program to illustrate the usage of abstract class.
4. A program to illustrate multithreading.
5. A program to illustrate thread synchronization.
6. A program using StringTokenizer
7. A program using Linked list class
8. A program using TreeSet class
9. A program using HashSet and Iterator classes.
10. A program using Map classes.
11. A program using Enumeration and Comparator interfaces.
12. A program to illustrate the usage of Filter and Buffered I/O streams
13. A program to illustrate the usage of Serialization

14. An application involving GUI with different controls, menus and event handling.
15. A program to demonstrate the usage of JAVA Beans

Learning Resources:

1. Herbert Schildt, *The Complete Reference Java*, 7th Edition, Tata McGraw Hill 2005.
2. James M Slack, *Programming and Problem Solving with JAVA*, Thomson Learning 2002.
3. C Thomas Wu, *An Introduction to Object Oriented Programming with Java*, Tata McGraw Hill, 2005.
4. P. Radha Krishna, *Object Oriented Programming through Java,* Universities Press, 2007.
5. Sachin Malhotra, Saurabh Choudhary, *Programming in Java*, 2nd Edition, Oxford Press, 2014.

SYLLABUS FOR
MICROPROCESSORS & INTERFACING LAB
BE 2/4 SECOND SEMESTER

Instructions: 3Periods / Week	Sem Exam Marks : 50	Subject Reference Code: **CS 2161**
Credits: 2	Sessional Marks : 25	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should	Students will be able to
To introduce to students the basics of microprocessor and microcontroller Programming and their applications.	1. demonstrate programming constructs of 8085 2. Understand and apply the fundamentals of assembly level programming of microprocessors 3. Analyze, apply, design and develop the programs to work with 8255, 8279, 8259, 8251, 8257 ICs. 4. Work with standard microprocessor interfaces including , serial ports, digital-to-analog converters and analog-to-digital converters 5. Practice microcontroller interfacing and their application programs.

PART A: 8085 PROGRAMMING USING MICROPROCESSOR

TRAINER KIT

1. Simple programming examples using 8085 addressing modes.
2. Programming examples using 8085 Data transfer and Arithmetic instructions.
3. Programming examples using 8085 Logical instructions.
4. Interfacing and programming of 8255. (E.g. traffic light controller).
5. Interfacing and programming of 8254. (E.g. Timer Programs).
6. Interacting and programming of 8279. (E.g. Display Character, Rolling Display).

PART B: 8051 PROGRAMMING

1. Simple Programming examples using 8051 Micro Controller.
2. Programming examples using arrays.
3. A/D converter interface.
4. D/A converter interface.
5. Stepper Motor interface.
6. Seven Segment LED Display interface.
7. Elevator Interface

Learning Resources:

1. Ramesh S Gaonkar, *Microprocessor Architecture, Programming and Applications with 8085,*5/E Prentice Hall, 2002.
2. Kenneth Ayala, *The 8051 Microcontroller,* West publishing company.

With effect from the academic year 2015-16

SYLLABUS FOR
FINISHING SCHOOL-II
B.E. 2/4 - SECOND SEMESTER

Instructions: 2+1 Periods / Week	Sem Exam Marks : 70	Subject Reference Code: **HS 2220**
Credits: 2	Sessional Marks : 30	Duration of Sem Exam:3 Hrs.

COURSE OBJECTIVE	COURSE OUTCOMES
Students should be able to	Students will be able to
1. Identify the various features and functions of human language and communication. 2. Develop the habit of listening effectively so as to analyze the speaker's tone and tenor. 3. Choose the appropriate words so as to speak and write accurately. 4. Read various types of texts and sift information correctly. 5. Write notes and letters for personal and official purposes.	1. Listen and analyze context, tone and tenor before responding to others. 2. Begin, sustain and end conversation. 3. Respond to people in different situations. 4. Read with adequate speed and comprehend various texts. 5. Use words appropriately in different contexts for speaking and writing. 6. Use markers in written discourse. 7. Construct grammatically correct sentences to write effectively.

SECTION-I
Soft Skills (35 Marks)

UNIT-I: ORAL COMMUNICATION: LANGUAGE FUNCTION IN CONTEXT

- Interpreting a conversation
- Apologizing and responding to apologies
- Expressing opinions
- Complimentary close to a conversation
- Expressing sympathy and condolences
- Describing process

UNIT II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for gist and specific information
- Note-taking
- Listening to identify cohesive devices and coherence in discourse

UNIT III: READING: COMMUNICATING WITH A GIVEN TEXT

- For supporting details to the main idea
- Note Making
- For discourse structure
- For basic referential and in inferential information

UNIT IV: WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Letters
- Email Etiquette
- Reports
- Resume writing

UNIT V: GRAMMAR- ADVANCED LEVEL

- Relative clauses
- Subject verb
- Prepositions
- Common errors

VOCABULARY- ADVANCED LEVEL

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

SECTION-II

Technical Skills (35 Marks)

- **C++ Programming:** Object oriented programming concepts, Defining classes, Abstract data types, Constructors, Destructors, Copy Constructor, Function and Operator overloading, Friend functions, Inheritance, Virtual functions, Runtime Polymorphism, Class templates, Exception handling.
- **Data Structures:** Complexity Analysis, Linked Lists, Stacks, Queues, Trees, Balanced Search trees, Graphs Sorting and Searching Techniques, Hashing
- **PHP :** An Introduction to PHP, Getting Started With Variables, Conditional Logic, Working with HTML Forms

Department of Civil Engineering

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER
(w.e.f. the academic year 2015-16)

ENGINEERING MECHANICS

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :2 periods week	Subject Reference Code: **CE 2080**
Semester Exam Marks : 50	Duration of Semester Exam: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
1. To learn the resolution of a system of spatial forces. 2. To assess the frictional forces on rigid body. 3. To understand the concepts of dynamics and its principles. 4. To explain kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion. 5. To impart the concepts of work-energy method and its applications to rectilinear translation, centroidal motion.	*students will be able to:* 1. Judge whether the body under the action of spatial force system. 2. Solve problem of bodies subjected to friction. 3. Distinguish between statics and dynamics and differentiate between kinematics and kinetics. 4. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatary motion and rigid body motion. 5. Know the concepts of work and energy principles subject and derive the work energy equations for translation, rotation and connected systems.

UNIT-I (3 periods)

Force Systems: Components of forces, moments in space and its applications.

UNIT-II (4 periods):

Friction: Laws of friction. Application to simple systems and wedge friction.

UNIT-III (5 periods) :

Kinematics: Rectilinear motion, curvilinear motion, Velocity and acceleration of a particle.

UNIT-IV (6 periods) :

Kinetics: Analysis as a particle. Analysis as a rigid body in translation. Fixed axis rotation and Rolling bodies.

UNIT-V (5 periods) :

Work Energy: Principles of work-energy, and its application to translation, Particle motion and connected systems.

Learning Resource:

1. F.L.Singer, "Engineering Mechanics", Harpper & Collins, Singapore 1994.
2. S.P.Timoshenko and D.H.Young, "Engineering Mechanics", McGraw Hill International Edition, 1983
3. Andrew Pytel., Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. F.P.Beer & E.R.Johnston, "Jr. Vector Mechanics for Engineers", TMH, 2004.
5. R.C.Hibbeler & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course and Virtual labs on the web.

With effect from the academic year 2015-16

Department of Physics

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

Physics of Materials (SECTION-I)

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :1 period week	Subject Reference Code: **PH 2130**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Course objectives	**Course Outcomes** *Student should be able*
• To apply basic principles of physics in field of engineering • Analyze the characteristics of semiconductor devices • To take up research at Undergraduate Level in new and emerging areas like materials science including magnetic, dielectrics and nanotechnology	• Differentiate properties, characteristics and applications of various materials like magnetic, dielectric and semiconducting materials • Inquire the new trends in interdisciplinary research area such as Magnetic materials, dielectric materials Semiconductors and nanotechnology

Unit -I

1. Dielectric Materials: (3 periods)

Polar and Non polar dielectrics-Different types of polarizations in dielectrics- Ferro-electric materials: properties and applications.

2. Magnetic Materials: (3 periods)

Ferro, Ferri and anti-ferro magnetic materials and their properties, Domain theory of ferromagnetism- Hysteresis (B-H) curve-soft and hard magnetic materials.

Unit – II:

1. Semiconductor Devices: (3 periods)

Fermi energy in semiconductor- Intrinsic carrier concentration of semiconductor-Characteristics of Photo diode and solar cell

2. Nano Materials: (3 periods)

Distinction between Bulk, thin and nano material-Surface to volume ratio-Quantum confinement-Basic properties of nano-materials, Applications of Nano materials and CNT's.

LEARNING RESOURCES:

1. Introduction to Solid State Physic*s,* Kittel C, Wiley Eastern
2. A text book of Engineering Physics, Avadhanulu & Kshirasagar
3. Applied Physics for Engineers, Neeraj Mehta, PHI
4. N Chattopadhyay, K. K.Banerjee- Introduction to Nanoscience and Nanotechnology, PHI

With effect from the academic year 2015-16

Department of Mathematics

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

Mathematics (SECTION-II)

(for All branches of 2/4 B.E-I SEMESTER)

Instruction :1 period week	Subject Reference Code: **MA 2040**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Course Objectives	Course Outcomes
• To understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability , discrete random variable • To practice the integration by substitution, integration by parts, multiple integrals problems • To understand the concepts of on the applications of integration to find areas, surface areas, volume of solid of revolution	• The student is able to understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability, discrete random variable • The Student is able to solve the problems on integration by substitution, integration by parts and multiple integrals • The student is able to understand the concepts on the applications of integration to find areas, surface areas, volume of solid of revolution

Unit -I (6 Periods):

Basics of Statistics & Probability: Measures of central tendency (Mean, Median & Mode) - Definition of Probability –Basic problems of Probability- Addition & Multiplication theorems- Discrete random variable

Unit -II (6 Periods):

Integral Calculus: Methods of integration (Integration by substitution and integration by parts)-Multiple Integrals -Applications of Integration - areas - Surface areas - Volume of solid of revolution

LEARNING RESOURCES:

1. Higher Engineering Mathematics by B.S. Grewal.
2. Fundamentals of Mathematical Statistics by Gupta & Kapoor
3. Integral calculus by Shantinarayan.

Department of Computer Science & Engineering
SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

C-PROGRAMMING LAB
(for All branches of 2/4 B.E-I SEMESTER)

Instruction :2 periods week	Subject Reference Code: **CS 2091**
Semester Exam Marks : **50**	Duration of Semester Exam: **3hr**

1. Finding roots of quadratic equation
2. Check whether a given number is (i) Prime (ii) Perfect (iii) Strong
3. Sin x and Cos x values using series expansion.
4. Menu driven program to calculate income tax
5. Generating Pascal's Triangle
6. Frequency of occurrence of characters and special characters like \n, \t, white spaces.
7. Bubble sort, Selection sort using arrays
8. Linear search and Binary Search.
9. Functions to find maximum and minimum of given set of numbers, interchange two numbers
10. Recursion: Factorial, Fibonacci, GCD of given numbers
11. Functions for string manipulations without using library functions
12. String comparisons and sorting using pointers to strings.
13. Matrix addition and multiplication using pointers
14. Programs on Structures and Unions
15. File handling programs, Finding the no: of characters, words and lines of given text file.
16. **Mini Project**: Simple application using the concepts of C language

Learning Resources:

1. B.A.Forouzan & Richard F.Gilberg, *A Structured Programming Approach using C*, 3rd Edition, Cengage Learning, 2013
2. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language,* 2nd Edition, Prentice-Hall, 2006
3. E.Balagurusamy, *Programming in ANSI C*, TMG, 4th Edition, 2008.

Department of Humanities and Social Sciences
SYLLABUS FOR BRIDGE COURSE BE 2/4 – SECOND SEMESTER

ELT-LAB
(for All branches of 2/4 B.E-II SEMESTER)

Instruction :2 periods week	Subject Reference Code: **HS 2231**
Semester Exam Marks : **50**	Duration of Semester Exam: 2hrs

Course objectives	**Course Outcomes** *Student should be able*
• Use language effectively without mother tongue influence. • Converse in various situations. • Make paper and power point presentations. • Listen to audio clippings, exchange dialogues and write short texts. • Speak effectively using discourse markers. • Read and understand various forms of texts and review them.	• Pronounce words in isolation as well as in spoken discourse. • Research and sift information to make presentations. • Comprehend the tone and tenor of various types of speeches from media and classroom lectures. • Listen for gist and make inferences from various speeches. • Identify connectives and transitions in various speeches. • Use connectives and make transitions effectively while speaking

PHONETICS LAB- TOPICS

1 **Introduction to English Phonetics:** Introduction to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems

2 **Sound System of English:** Phonetic sounds, Introduction to International Phonetic Alphabet, Classification and Description of English Phonemic sounds; Minimal pairs: The Syllable: Types of syllables; Difficulties of Indian speakers with sound of English.

3 **Rhythm and Intonation:** Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications; difficulties of Indian speakers with sound of English.

INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

1 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.
2 **Debate:** Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.
3 **Presentation Skills:** Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-Verbal Communication, Coping with Stage Fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.
4 **Public Speaking:** Advantages of public speaking, essentials of an effective speech, types of delivery, rehearsal techniques, planning and delivering a speech.