With effect from the academic year 2015-16

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF INFORMATION TECHNOLOGY

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

DEPARTMENT VISION

To be a Center of Excellence in multidisciplinary learning and research, where students get acquainted with latest technologies and apply them for self and societal growth.

DEPARTMENT MISSION

To enable the students acquire outstanding competence and skills in latest technologies through practice-oriented teaching and training.

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 INFORMATION TECHNOLOGY

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

B.E. II/IV (Regular)

S No.	Code	Subject	Scheme of Instruction			Scheme of Examination			
			Periods per week			Duration in Hrs	Maximum Marks		Credits
			L	T	P		SEM Exam	Sessionals	
1	IT 2010	Discrete Mathematics	3	1		3	70	30	3
2	IT2020	Micro Electronics	3	1		3	70	30	3
3	IT2030	Digital Electronics & Logic Design	3	2		3	70	30	4
4	IT2040	Data Structures	3	1		3	70	30	3
5	IT2050	Signals & Systems	3	1		3	70	30	3
6	IT2060	Computer Organization	3	1		3	70	30	3
7	HS2140	Human Values & Professional Ethics	2			3	70	30	1
8	HS2190	Finishing School-I	2			3	70	30	2
Practicals									
9	IT2071	Basic Electronics Lab			3	3	50	25	2
10	IT2081	Data Structures Lab			3	3	50	25	2
11	IT2095	Mini Project-I				3		25	1
		Total	**22**	**7**	**6**		**660**	**315**	**27**
		Grand Total	**35**			**-**	**975**		

With effect from the academic year 2015-16

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD-31

SCHEME OF INSTRUCTION & EXAMINATION

2/4 B.E. Bridge Course (for Lateral Entry Students of all branches)

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, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY

SYLLABUS FOR 2/4 B.E- I-Semester
DISCRETE MATHEMATICS

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2010**
Credits : 3	Sessional Marks :30	Duration of SemExam : 3 Hrs

Course Objectives	**Course Outcomes**
the students shall:	**student will be able to:**
Develop an ability to reason mathematically about basic data types and structures in computer algorithm	1. Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, functions, and integers. 2. Use of algebraic structure such as groups in theoretical computer science. 3. Construct mathematical arguments using logical connectives and quantifiers, verify the correctness of an argument using propositional and predicate logic and truth tables and use graphs as a tool to visualize and simplify situation. 4. Apply algorithms and use definitions to solve problems to prove statements in elementary number theory. 5. Demonstrate the ability to solve problems using counting techniques and combinatorics and solve problems involving recurrence relations and generating functions.

UNIT - I:

Review of Set Theory: Sets, Subsets, set Operations & Laws of Set Theory, Principles of inclusion & Exclusion.**Relation:** Definition, types of relation, Equivalence relation, partial ordering relation, Poset, Hasse diagram & Lattice. **Function:** Definition, types of function, one to one, into and onto function, composition of function, inverse function, recursively defined function.**Theorem proving technique:** Mathematical induction, proof by contradiction.

UNIT –II:

Algebraic Structure: Definition, Properties, Types, Semi Graphs, Monoid, Groups, Abelian Group, Properties of Groups, Sub Group, Cyclic Group, Cosets, Factor Group, Permutation Groups, Normal Sub Group, Homomorphism & Isomorphism of group.

UNIT – III:

Propositional Logic: Logical connectives, Propositional equivalences, Predicates and quantifiers, Nested quantifiers. **Graph Theory:** Introduction & Basic terminology of graph, Types of graphs, path, Cycle and Connectivity, Isomorphism and Homomorphism of graphs.

UNIT-IV:

Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic. Application of Congruences- Cryptology. Integers and Algorithms- Euclidean Algorithm. Applications of Number Theory-Linear Congruences- Fermat's Little Theorem.

UNIT – V:

Counting: Basics of counting, Pigeonhole principle, Permutations and combinations, Binomial Theorem. **Recurrence Relation & Generating function:** Introduction to Recurrence relations & Recursive Algorithm, Linear Recurrence Relations with constant coefficient, Homogeneous Solutions, Particular solutions, total solutions, generating function-using generating functions to prove identities and to solve recurrence relation.

Learning Resources:

1. Kenneth H Rosen, "Discrete Mathematics & its Applications" TMHl,6th Ed 2007.
2. Dr.D.C. Agarwal, "Discrete Structure" Shree Sai Prakashan Publication, 6th Edition 2011.
3. Joe L.Mott, A.Kandal & R. Manohar, "Discrete Mathematics for Computer scientists, & Mathematicians", Prentice Hll N.J., 1986.
4. Ralph P.Grimaldi, "Discrete and Combinatorial Mathematics", Pearson Education, 4th Edition, 2003.
5. J.P.Tremblay & R.Manohar,"Discrete Mathematical Structures with Applications to Computer science", Mc Graw Hill, 1987.
6. Discrete Mathematics by R.K. Bisht, H.S. Bhami Oxford Publications,2015
7. http://nptel.iitm.ac.in

SYLLABUS FOR 2/4 B.E- I-Semester
MICROELECTRONICS

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2020**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Learn the different electronic devices, characteristics and their applications	Explain the principle of operation of p n junction diode and to design small applications such switch, rectifier etc. Distinguish hole current and electron current and hence the working of BJT and analyze its operation as amplifier and switch List the advantages of MOSFET over JFET and implement Boolean logic functions using CMOS logic List the advantages of Negative feedback amplifiers and also describe the working of different types of Oscillator circuits. Design adder, subtractor, comparator etc. using Operational Amplifier

UNIT – I

Semi-conductors, Conductors, and Insulators, Covalent bonds, conduction in semi-conductors, N-type and P-type semi-conductors, PN junction, Biasing, Zener diodes, Rectifier Circuits, Limiting and clamping circuits, Schottky Barrier diode and Varactor diode.Cathode Ray Oscilloscope and its applications

UNIT – II

Bipolar junction transistors – Physical structure and modes of operation, npn transistor, pnp transistor, characteristics, analysis of transistor circuits at DC, , biasing, transistor as amplifier, effect of emitter bypass capacitance, small signal equivalent circuit model, approximate analysis, transistor as switch, internal capacitance. Pi equivalent circuit, low frequency and high frequency operation, thermal run away

UNIT – III

JFET Characteristics and Operation, MOSFET current-voltage characteristics, MOSFET as an amplifier and as a switch, biasing, Internal capacitance,
Digital CMOS logic circuits: Introduction, digital IC technologies and logic circuit families, Voltage Transfer Characteristic (VTC) of inverter, Noise Margins, Propagation delay, static and dynamic operation of CMOS inverter. CMOS logic gate circuits: Basic structure (PUN and PDN), Implementation of 2-input NOR gate, NAND gate, complex gates and exclusive OR gate.

UNIT – IV

Feedback – Structure, Properties of negative feedback, Topologies, Advantages of negative feedback amplifiers Sinusoidal Oscillators – Loop gain, Barkhausen criteria, RC Phase shift, LC and Crystal Oscillators.
Power Amplifiers: class A, B and C amplifiers.

UNIT – V

Operational Amplifiers : Ideal characteristics, op. amp. as adder, Subtractor, Integrator, differentiator and comparator using op. amp. Generation of square and Triangular waveforms, Monostable multi vibrator.
Op. Amp. As Voltage –controlled current switch (VCCS), Current-controlled Voltage source(CCVS), Instrumentation Amplifier, antilogarithmic amplifiers and analog multipliers.

Learning Resources:

1. Jacob Millman, Christos C Halkais, Satybrata jit, Electronic Devices and Circuits,Mc Graw Hill India Private Ltd, 3rd Edition,2008.
2. Adel S. Sedra, Kenneth C. Smith, Microelectronic Circuits, 5th Edition, Oxford International Student Edition, 2006
3. D. Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International Publishers, 4th Edition, 2011.
4. Jocob Millman, Arvin grable – Micro Electronics – 2nd Edition, McGraw Hill 1987.
5. Donald L. Schilling, Charles Belove, Electronic Circuits Discrete and Integrated, Tata Mc Graw Hill Education, 3rd Edition, 1989.

SYLLABUS FOR 2/4 B.E- I-Semester
DIGITAL ELECTRONICS & LOGIC DESIGN

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2030**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Understand the operation of different logic gates, programmable logic devices, flip flops and use them in the design and implementation of digital circuits using VHDL.	Demonstrate the knowledge of operation of logic gates (AND, OR, NAND, NOR, XOR, XNOR) along with developing the circuits using Boolean algebra including algebraic manipulation/simplification, application of various theorems, reduction methods and simulating using HDL. Explain the internal architectures of FPGA's, ASIC's, PLD's. Design combinational circuits (arithmetic circuits, code converters), simulating using HDL. Design basic sequential blocks such as flipflops, registers etc. Design and analyze sequential digital circuits. Distinguish between synchronous and asynchronous sequential circuits, to define set up and hold time of a flip-flop

UNIT – I

Introduction to Boolean algebra and number system, Logic Gates, Optimized implementation of logic functions – Karnaugh Map, Strategies for minimization of product-of-sum and sum-of-product functions. Multiple output circuits. NAND and NOR logic networks, Cost functions, TTL 74 series gates,Introduction to CAD tools and VHDL

UNIT – II

Programmable logic devices: general structure of a PLA, gate level diagram, schematic diagram, PAL. Structure of CPLDs and FPGAs, 2-input and 3-input lookup tables(LUT). Design of Arithmetic-circuits using CAD tools. Combinational circuit building blocks – Multiplexers. Decoders. Encoders. Code converters, Arithmetic comparison circuits. TTL 74 series ICs, VHDL for Combinational circuits

UNIT – III

Basic Latch, Gated SR Latch, gated D Latch Master-Slave edge triggered flip-flops. T Flip-flop, JK Flip-flop, excitation tables. Registers, Counter. TTL 74 series ICs,Using registers and counters with CAD tools. Design examples using VHDL.

UNIT – IV

Synchronous Sequential Circuits – Basic design steps. State-Assignment problem Moore and Mealy state models. State minimization, FSM as an Arbiter Circuit, Analysis of Synchronous sequential Circuits. Introduction to Asynchronous sequential circuits. Design of FSM with CAD Tools. Implementation using VHDL.

UNIT – V

ASM Charts, Hazards: static and dynamic hazards. Significance of Hazards.Clock skew, set up and hold time of a flip-flop, Digital Hardware Design Flow.

VHDL code using ASM Charts

Learning Resources:

1. Stephen Brown Zvonko Vranesic – Fundamentals of Digital Logic with VHDL design, McGraw Hill – 2000.
2. M. Moris Mano, Charles R. Kime, Logic and Computer Design Fundamentals, 2nd edition, Pearson Education Asia, 2001.
3. Virendrakumar - Digital ElectronicsTheory & Experiments, New Age International Publishers, 2002
4. John F. Walkerly, Digital Design : Principles and Practices, Pearson India, 4th Edition,2005
5. Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, Digital Systems: Principles and Applications, Pearson India, 11th Edition,2010.

SYLLABUS FOR 2/4 B.E- I-Semester
DATA STRUCTURES

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2040**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
the students shall:	**student will be able to:**
explore efficient storage mechanisms for easy access, design and implementation of various data structures	Apply different linear data structures to solve problems Illustrate the usage of linked lists for various applications Demonstrate the usage of non-linear data structures – graphs & trees Apply different sorting and hashing techniques to a given problem Use advanced non-linear DS to improve efficiency

UNIT-I:

Linear Data Structures: Algorithm Specification, Performance Analysis & Measurements.

Abstract Data Type [ADT]: List, Stack, Queue, Using Arrays and Linked Lists – review, Polynomial Abstract Data Type, String Abstract Data Type, applications of Linear Data Structures: A Mazing problem, Evaluation of Expressions

UNIT-II

Linear Data Structure: Single Linked List, Stack and Queue – Review, Chains, Representing Chains in C++, Template Class Chain, Circular Lists, Doubly-linked list

Applications of Lists – Polynomial manipulation- Operations (Insertion, Deletion, Merge)

UNIT-III:

Non-Linear Data Structures:

Trees: Introduction, Binary Trees, Binary Tree Traversal and Tree Iterators, Copying Binary Trees, Heaps, Binary Search Trees

Graphs: Graph abstract data type, elementary graph operations (Depth First Search (DFS), Breadth First Search (BFS) , Minimum cost spanning trees (Prim's and Kruskal's Algorithm)

Shortest path algorithm – Dijkstra's Algorithm, Bellman- Ford Algorithm

UNIT-IV:

Sorting and Hashing:

Sorting: Insertion sort, Quick sort, Merge Sort, Radix Sort, Heap Sort, Best computing time for sorting storage.

Hashing: Static Hashing, Hash Tables, Hash Functions, Secure Hashing Functions, Overflow Handling, Theoretical Evaluation of Overflow Techniques

UNIT-V:

Advanced Non-Linear Data Structures

Efficient Binary Search Trees: AVL Trees, Red-Black Trees, Splay Trees, M-way Search Trees, B-Trees.

Suggested Reading:

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. Fundamentals of Data Structures in C++, Universities Press. 2007.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education 2006.

References:

1. Michael T. Goodrich, Roberto Tamassia, David Mount, Data structures and Algorithms in C++, Wiley India Pvt. Ltd, 2004
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stem 'Introduction to Algorithms' 2002.

SYLLABUS FOR 2/4 B.E- I-Semester
SIGNALS & SYSTEMS

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2050**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Identify the different types of signals and systems and analyse them using different transformation techniques.	1. Classify different types of signals and commonly used functions and their operations on continuous time and discrete time signals. 2. Analyze the characteristics of different types of systems and to determine the characteristics of stable system. 3. Derive the energy spectral density and power spectral density of signals using the concepts of Fourier series and Fourier transforms and to write Matlab programs for the same. 4. Analyze continuous time signals using the concept of Laplace transform. 5. Analyze the discrete time signals and systems using the concept of DTFT and Z transform.

UNIT– I Signals

Introduction, Continuous time and Discrete time signals, Periodic signals, Even and Odd signals, Exponential and Sinusoidal signals, Unit Impulse and Unit Step functions, Operations on continuous time and discrete time signals (addition, subtraction, multiplication, amplitude and time scaling).convolution integral, graphical convolution of continuous time signals, The convolution sum, discrete convolution. MATLAB Examples: Programs on Signal generation and signal operations

UNIT – II Systems

Continuous time and Discrete time Systems, Basic System properties- linearity, Time Invariance, Causality, BIBO Stability, Linear Time Invariant Systems, Properties of Linear Time Invariant Systems, Impulse response of a system, series, parallel and series-parallel interconnection of systems, simplifications, Causal LTI systems described by Differential and Difference Equations.

UNIT – III Fourier Series, Fourier Transform

Fourier series Representation of Continuous time Periodic signals, Convergence of Fourier Series, Properties of Continuous time Fourier Series, Fourier Series

representation of Discrete time Periodic signals and its properties, The Continuous time Fourier Transform, Properties of Continuous time Fourier Transform, Systems characterized by Linear constant coefficient Differential Equations, Parseval's theorem for continuous and discrete time signals, Magnitude and phase spectra, Energy spectral density (ESD) and Power Spectral Density(PSD). MATLAB Examples: Programs on Fourier Series, Fourier Transform

UNIT – IV Laplace Transform, Sampling

Laplace Transform – Definition, Region of Convergence, properties, partial fraction expansion and relationship to Fourier transforms, Inverse Laplace transform. Solution of differential equations

Introduction to Sampling, Representation of a Continuous time signal by its samples: The Sampling Theorem, The Effect of under sampling: Aliasing, Reconstruction of a signal from its Samples using Interpolation. Quantization. MATLAB Examples: Programs on Laplace Transform and Sampling

UNIT – V Discrete Time Fourier Transform and Z transform

The Discrete Time Fourier Transform, Properties of Discrete Time Fourier Transform, Analysis of Systems characterized by Linear Constant coefficient Difference Equations. MATLAB Examples: Programs on Discrete time Fourier Transform.

Introduction to Z Transform, Region of Convergence, Properties of Z transform, Concept of Pole –Zero plots, The Inverse Z transform, One Sided Z Transform or Unilateral Z Transform, Analysis and Characterization of LTI Systems using Z transform. MATLAB Examples: Programs on Z Transform

Learning Resources:

1. Lathi, B.P. Principles of Linear Systems & Signals, Oxford University press, 2nd edition, 2009.
2. Alan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab, Signals and Systems, Prentice Hall of India Private Limited,1997.
3. Simon Haykin, Barry Van Veen, Signals and Systems, Wiley, 2nd Edition,2007
4. Douglas K. Lindner – Introduction to Signals and Systems – McGraw Hill 1999.
5. Rodger E. ziemer, William H Trenter, D. Ronald Faninn – Signals & Systems – 4th Edition, Pearson 1998.
6. A. Anand Kumar, Signals and Systems, PHI Learning Press, 3rd Edition,2013.
7. H.P. Hsu, Signals and Systems, Schaum's Outline Series, Mc Graw Hill Education (India) Pvt. Ltd, 2nd Edition,2008

SYLLABUS FOR 2/4 B.E- I-Semester
COMPUTER ORGANIZATION

Instruction: 4 Periods / week	Sem Exam Marks : 70	Subject Reference Code : **IT 2060**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Gain knowledge about the architectural details of a computer, its programming and interfacing the different peripherals.	1. Explain the significance of the basic functional units and the ways they are interconnected to form a complete computer system. 2. Comprehend the register transfer and micro operations and have an understanding of basic computer organization 3. Describe interrupts and direct memory access methods and micro programming 4. Explain the advantages caches, virtual memories and memory management. 5. Identify the importance of pipelining and multiple function units in the design of high-performance processors.

Unit I: Basic Structure of Computers

Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multi-computers, Historical Perspective, Numbers, Arithmetic operations and Characters, Addition and Subtraction of Signed Numbers, Floating point Numbers and Operations

Unit II: Machine Instructions and Programs

Memory locations and Addresses, Memory operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly language, Basic Input/Output Operations, Stacks and Queues, Subroutines, Additional Instructions

Unit III: Input Output organization and Basic Processing Unit

Accessing I/O devices, Interrupts, Direct Memory Access (DMA), Buses, Interface Circuits, Standard I/O Interfaces-PCI, SCSI, USB, Basic Processing Unit-Some fundamental concepts, Execution of a complete Instruction, Multiple -Bus Organization, Hardwired control and Microprogrammed control

Unit IV: Memory System

Some Basic Concepts, Semiconductor RAM Memories, Read -Only memories, Cache Memories, Performance considerations, Virtual Memories, Memory Management Requirements, Secondary Storage-Magnetic Hard disks, Optical Disks, Magnetic Tape Systems

Unit V: Pipelining

Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction sets, Datapath and control considerations, Super Scalar Operation, Performance considerations

Learning Resource:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, 5th Edition, McGraw Hill, 2002.
2. M. M. Mano, Computer System Architecture, 3rd Edition, Prentice Hall, 1994.
3. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002.
4. J .P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.
5. Pal Chouduri, Computer Organization and Design, 2nd Ed. Prentice Hall of India, 2007
6. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface", 2005.

SYLLABUS FOR 2/4 B.E- I-Semester
BASIC ELECTRONICS LAB

Instruction: 3 Periods / week	Sem Exam Marks : 50	Subject Reference Code : **IT 2071**
Credits :2	Sessional Marks :25	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Identify the different electronic devices and use them in building different application circuits.	1. Identify and use different electronic devices and measuring equipment. 2. Use PN diode, Zener diode for applications like rectifiers, clipping and clamping circuits and voltage regulators. 3. Use BJT transistor in the design of amplifier circuit. 4. Implement different types of oscillator circuits. 5. Use operational amplifier for different applications and verify the operation of different digital circuits.

ANALOG:

1. CRO and its applications: Measurement of amplitude, frequency. Obtaining transfer characteristics and lissajous figures. Determination of unknown frequency using CRO.
2. Characteristics of pn junction diode, zener diode, BJT and FET. Applications: Half-wave and full-wave rectifiers, clipping and clamping circuits, BJT and FET as switches
3. Frequency response of Common Emitter amplifier
4. Hartley, colpitts and RC phase shift oscillators
5. Operational Amplifier as an adder, subtractor, differentiator, integrator and comparator

DIGITAL:

6. Truth table verification of logic gates using TTL 74 series ICs. Transfer characteristics of a TTL gate using CRO
7. Half Adder, Full Adder, Decoder, MUX, implementation of Boolean logic using decoders and MUXes.
8. Truth table verification of D flip flop, T flip-flop and JK flip-flop
9. Counters
10. Shift Registers

SIMULATION: Experiments using Microwind/PSPICE/any other simulation tool

Note: Depending on the amount of work done in each activity and submission of the record, marks / grade will be awarded.

SYLLABUS FOR 2/4 B.E- I-Semester
DATA STRUCTURES LAB

Instruction: 3 Periods / week	Sem Exam Marks : 50	Subject Reference Code : **IT 2081**
Credits :2	Sessional Marks :25	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student able to:**
Develop skills in design and implementation of abstractions of various linear and nonlinear data structures and their practical applications.	1. Perform various operations on data structures such as stack, queues, and linked lists. 2. Implement various sorting techniques. 3. Implement and perform different operations on trees and graphs.

1. C++ Program to implement Array ADT , String ADT .
2. menu driven program that implements Stacks & Queues for the following operations
   a) create b)push c)pop
3. menu driven program that implements Circular Queues for the following operations
   a) create b)Insert c)delete
4. Implementation of Infix to Postfix Conversion, evaluation of postfix expression.
5. Implementation of Doubly Linked List.
6. C++ Program to perform Polynomial arithmetic using linked list
7. Implementation of Binary Search and Hashing.
8. Implementation of Merge and Quick sort.
9. Implementation of Tree Traversals on Binary Trees.
10. Implementation of Heap Sort.
11. Implementation of Insertion and deletion operations on AVL Trees.
12. Implementation of Breadth First search Traversal on Graphs.
13. Implementation of Depth First search Traversal on Graphs

Note: Depending on the amount of work done in each activity and submission of the record, marks / grade will be awarded.

SYLLABUS FOR 2/4 B.E- I-Semester
MINI PROJECT-I

Instruction: 3 Periods / week	Sem Exam Marks : **NIL**	Subject Reference Code : **IT 2095**
Credits : 1	Sessional Marks :25	Duration of Sem Exam : 3 Hours

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Develop and implement a project using any of the programming languages/simulation tools/electronic components.	1. Develop effective solutions to various computing problems by applying the theoretical knowledge gained. 2. Implement projects and demonstrate them using presentations and technical reports

- The students are required to implement two projects (one hardware related and the other software related) from project exercises given in the suggested readings and reference books of the theory subjects.
- During the implementation of the projects, Personnel Software Process (PSP) has to be followed.
- Two reviews will be conducted.
- Report of the project work has to be submitted for evaluation.

With effect from the academic year 2015-16

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 2190**
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)

Unit – I: Introduction to python, comments, variables, operators, mathematical operations, strings and text, format specifiers, printing information.

Unit – II: Command line arguments, prompting users, parameters, packing and unpacking of variables, reading and writing files.

Unit – III: Functions: passing arguments to functions, returning values from functions, functions and files.

Unit – IV: Decision making: if and else if, repetition: while loops, for loops. Lists, iterating a list, operations on list. Dictionaries, operations on dictionaries.

Unit – V: Modules, Classes and Objects, is-a relationship: inheritance, has-a relationship: composition. Exceptions, creating a project skeleton, automated testing.

With effect from the academic year 2015-16

VASAVI COLLEGE OF ENGINEERING (Autonomous)
INFORMATION TECHNOLOGY
SCHEME OF INSTRUCTIONAND EXAMINATION FOR 2/4 B.E- II Semester

S No.	Code	Subject	Scheme of Instruction			Scheme of Examination			
			Periods per week			Duration in Hrs	Maximum Marks		Credits
			L	T	P		SEM Exam	Sessionals	
Theory									
1	IT2100	Probability & Random Processes	3	1		3	70	30	3
2	IT2110	Microprocessor & Microcontroller	3	1		3	70	30	3
3	IT2120	OOP using Java	3	1		3	70	30	3
4	IT2130	Data Communication	3	2		3	70	30	4
5	IT2140	Design & Analysis of Algorithms	3	1		3	70	30	3
6	CE2090	Environmental Studies	4			3	70	30	3
7	HS2260	Finishing School-II	2			3	70	30	1
Practical's									
8	IT2151	Microprocessor Lab			3	3	50	25	2
9	IT2161	Java Programming Lab			3	3	50	25	2
10	IT2175	Mini Project-II			3	-	-	25	1
		Total	**21**	**6**	**9**		**590**	**285**	
		Grand Total	**36**				**875**		**25**

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
PROBABILITY & RANDOM PROCESSES

Instruction : 3+1 Periods per week	Semester Exam Marks :70	Subject Reference Code **IT 2100**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Apply the concepts of probability and random process theory in the analysis of random signals and their associated random phenomenon.	1. Apply the concepts of Probability, Joint and Conditional probability in solving mathematical problems. 2. Distinguish the different types of Random Variables 3. Classify any natural signal as Random process and make proper mathematical analysis of the natural signal using the concept of random variables and random processes.

UNIT – I: The meaning of Probability – Introduction- the definitions – Probability and Induction – Causality versus Randomness.

The Axioms of Probability: Set theory – Probability Space – Conditional Probability.

Repeated Trials: Combined Experiments – Bernoulli Trials – Bernoulli's theorem and games of chance.

UNIT – II:The Concept of a Random Variable: Introduction – Distribution and Density functions- Specific Random Variables – Conditional Distributions – Asymptotic Approximations for Binomial Random variables.

Functions of One Random Variables: The Random Variable g(x) – The Distribution of g(x) – Mean and Variance – Moments – Characteristic Functions.

UNIT – III: Two Random Variables: Bivariate Distributions – One Function of Two Random Variables – Two Function of Two Random Variables – Joint Moments – Joint Characteristic Functions – Conditional Distributions – Conditional Excepted Values.

UNIT – IV:Random Processes – Definitions – Basic concepts and examples – Stationarity and ergodicity – Second order processes – Weakly stationary processes – Covariance functions and their properties – Spectral representation Weiner – Kinchine theorem.

UNIT –V:Linear Operations: Gaussian processes – Poisson Processes – Low pass and Band pass noise representations.

Learning Resources:

1. Papoulis: Probability, Random Variables and Stochastic processes, 4th Edition Tata McGraw Hill, 2002
2. Peyton Z. Peebles, Probability, Random Variables and Random Signal Principles, Mc Graw Hill Education (India) Private Limited, 4th Edition,2000.
3. Wilbur B. Davenport, Probability and random processes: an introduction for applied scientists and engineers, Mc Graw Hill, 1970
4. E. Wong, Introduction to Random Processes, Springer texts in Electrical Engineering, Springer-Verlag, NewYork, 1983.
5. H. Stark and J. Woods, Probability, Random processes, and Estimation Theory for Engineers, Prentice Hall, 1986

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
MICROPROCESSORS & MICROCONTROLLERS

Instruction : 3+1 Periods per week	Semester Exam Marks :70	Subject Reference Code **IT 2110**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Understand the development of systems for different applications using microprocessor and microcontroller.	1. Explain the architecture and instruction set of 8085 microprocessor. 2. Understand the different techniques for interfacing different peripherals. 3. Explain the architecture and instruction set of 8051 microcontroller. 4. Illustrate the different peripheral interfacing methods for 8051 microcontroller. 5. Identify the different signal conditioning circuits, D/A, A/D circuits and study the tools used to build applications using microcontroller.

UNIT-I : Introduction to Microprocessors & Microcontrollers. Architecture and Organization of 8085; Instruction set, Assembly language programming.

UNIT-II: Memory Interfacing, Data Transfer Techniques, I/O Ports, Interfacing of Switches, Interfacing of LED Displays, Programmable Interrupt and DMA Controller.

UNIT-III : Serial Mode Data Transfer, Programmable Timer/Counter Designing μp based system. Architecture and Organization of μc 8051, Instruction Set of 8051, Assembly language programming.

UNIT-IV: Interfacing External memory to 8031, 8051, Timer/Counter Operation, 8051 Serial Data Communication, Interfacing Keyboard and Display devices to 8051.

Unit-V: Transducers, Signal Conditioning Circuits, Opto Coupler, Relays & DACs, ADCs and Data acquisition Subsystems Development Aids and Trouble Shooting techniques, Microcontroller application, RTOS for Embedded Application.

Learning Resources*:*

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 5/E Prentice Hall, 2002.
2. Kenneth J.Ayala, 'The 8051 microcontroller Architecture, Programming and applications' second edition, Penram international, 1997.
3. Wayne Wolf, Computers as components: Principles of Embedded Computing Design, Elseiver, 2nd edition, 2009.
4. Ajay V. Deshmukh, Micro controllers: Theory and Applications, Mc Graw Hill Education (India) Private Limited, First Edition, 2005
5. Frank Vahid, Tony Givargis, Embedded System Design: A Unified Hardware/ Software Introduction, Wiley Publishers, 3rd Edition2001.

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
OOP USING JAVA

Instruction : 3+1Periods per week	Semester Exam Marks :70	Subject Reference Code **IT 2120**
Credits : 3	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
the students shall:	**student will be able to:**
The objective of the course is to explain the features of java and different predefined classes and Event handling.	1. The student will be able to write applications to perform different tasks like usage of data types, method overloading, Inheritance, Creation of packages , Interfaces 2. The student will be in a position to handle exceptions in an efficient way with predefined methods, performing input and output operations with different stream handling classes. 3. The student will be able to generate object representation of a data type, using group of objects in a collection frame work ,dividing the string into tokens using string tokenizer 4. The student will be able to create an applet, handle events using Delegation event model, creation of controls. 5. The student will be able to describe swing, swing features and demonstrate its applications.

UNIT- I

Object Oriented Concepts review

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control statements, Classes, Methods, Inheritance, Packages and Interfaces.I/O basics , Reading console input and output.

UNIT- II

Exception Handling, Multithreaded Programming, Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization. String Handling.

UNIT- III

Exploring Java Language, Collections Overview, Collections Interfaces, Collections Classes, Iterators, Random Access Interface, Maps, Comparators, Arrays, Legacy classes and interfaces, String tokenizer, BitSet, Date, Calendar, Timer.

UNIT- IV

Introducing AWT working with Graphics: AWT Classes, Working with Graphics.

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces. Applets.

AWT Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, Managing Scroll Bars, Using Text Field, Using Text Area, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, File Dialog, Exploring the controls, Menus ,and Layout Managers.

UNIT- V

Introducing Swing: The Origins of Swing, Swing features, Components and Containers, Swing packages, Swing Applications.

Learning Resources*:*

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
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 5th edition, McGraw Hill Publishing, 2010.

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
DATA COMMUNICATION

Instruction : 3+2Periods per week	Semester Exam Marks :70	Subject Reference Code **IT 2130**
Credits : 4	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
the students shall	**student will be able to:**
Understand different ways of data communication and the protocols used for wired and wireless networking.	1. List different coding schemes of data communication, networking, protocols, standards, Networking models and different encoding techniques. 2. Describe the services provided by the Datalink layer and implementation of these services in LAN's and WAN's. 3. Explain the bandwidth utilization technique such as Multiplexing and for connecting multiple devices. 4. Understand the IEEE standard, Gigabit Ethernet. 5. Describe two promising WLAN technologies such as 802.11 and Bluetooth and how this wireless technology is used in cellular telephony

UNIT-I : Introduction: Communication model, Data Communication networking, Protocols and Architecture, Standards.
Data Transmission: Concepts and terminology, Analog and Digital Transmission, Transmission Impairments, Transmission media.
Data Encoding: Digital Data Digital Signals, Digital Data-Analog Signals, Analog Data-Digital Signals, Analog Data-Analog Signals.

UNIT-II : Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configuration, Interfacing.
Data Link Controls: Flow Control, Error Detection, Error Control, HDLC, other Data link Control protocols, performance issues.

UNIT – III : Multiplexing: Frequency Division Multiplexing, Synchronous time - Division Multiplexing, Statistical Time – Division Multiplexing. Asymmetric Digital Subscriber line, xDSL. Circuit Switching, Packet Switching & Frame Relay.
ATM Architecture, Logical Connection, ATM Cells, Transmission of ATM cells.

UNIT –IV : Traditional Ethernet: Topologies and Transmission Media, LAN protocol architecture, MAC sub layer, - CSMA/CD, Physical Layer, Implementation, Bridged, switched and full duplex Ethernets, Layer 2 and Layer 3 Switches.
Fast Ethernet: MAC sublayer, Physical sublayer, Implementation.
Gigabit Ethernet: MAC sublayer, Physical Layer, Implementation.

UNIT –V : Cellular Wireless Networks: Principles of Cellular Networks, First Generation Analog Second Generation CDMA, Third Generation Systems.
Wireless LANs: Overview, Wireless LAN Technology, IEEE 802.11. Architecture and services, IEEE 802.11 Medium Access Control, IEEE 802.11 Physical Layer.
Bluetooth: Architecture, Layers.

Learning Resources:

1. William Stallings, Data and Computer communication, 7th edition. Pearson Education, Asia-2004.
2. Behrouz A. Forouzan, Data Communications and Networking, 4th Edition, Tata McGraw Hill, 2006.
3. Fred Halsall, Data Communications, Computer Networks and Open Systems, 4th Edition, Pearson Education, 2000.
4. Simon Haykin, " Communication Systems", John Wiley & Sons, 2004
5. H. Taub, D L Schilling, G Saha, "Principles of Communications", 3rd Edition, Pearson Education, 2007.

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

Instruction : 3Periods per week	Semester Exam Marks :70	Subject Reference Code **IT 2140**
Credits : 4	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
analyze the performance of different algorithms for their time and space complexities, and for a given problem, design the optimal solution using various algorithmic design techniques.	1. Analyze asymptotic run-time complexity of algorithms including formulating recurrence relations 2. Design algorithms using greedy strategy, divide and conquer approach, and analyze them 3. Describe the dynamic-programming approach and explain when an algorithmic design situation calls for it. 4. Apply algorithmic design paradigms like Backtracking and Branch-and-bound for solving problems 5. Formulate Non deterministic algorithms for NP hard and NP complete problems.

UNIT-I

Introduction: Algorithm__Specification, Performance analysis, Space Complexity, Time Complexity, Asymptotic Notation(O, Omega, Theta), Practical Complexities, Performance Measurement, Review of elementary data structures, Heap and Heap Sort, Hashing, Set representation, UNION, FIND.

UNIT-II

Divide- and Conquer: The general method, finding the maximum and minimum, Merge sort quick sort, Strassen's Matrix Multiplication.
Greedy Method: The general method, Knapsack problem, Job sequencing with deadlines, Minimum-Cost Spanning Trees, Optimal Storage on tapes, Optimal merge patterns, Huffman Codes.

UNIT-III

Dynamic Programming And Traversal Technique: Multistage graph, All-Pairs Shortest Paths, Optimal Binary Search trees, 0/1 Knapsack, Reliability Design, The Traveling Salesman Problem, Biconnected Components and Depth First Search.

UNIT-IV

Backtracking and Branch and Bounds: The 8-Queens Problem, Graph Coloring, Hamiltonian cycles, Knapsack Problem, 0/1 Knapsack Problem, Traveling salesperson problem, Lower-Bound Theory- Comparison Trees.

UNIT-V

NP-Hard and NP-Completeness: Basic concepts, cook's theorem, NP-hard graph problems-Clique Decision Problem, Node Cover Decision Problem, NP-Hard Scheduling Problem, NP-hard code generation problems,

Learning Resources:

1. Horowitz E. Sahani S: Fundamentals of Computer Algorithm, Second edition, University Press, 2007.
2. Anany Levitin, Introduction to the Design & Analysis, of Algorithms, Pearson Education, 2003.
3. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", Third edition, MIT, 2010
4. Aho, Hopcroft, Ulman, The Design and Analysis of Computer Algorithm, Pearson Education, 2000.
5. Parag H.Dave, Himanshu B. Dave, Design and Analysis of Algorithms, Pearson Education, 2008.

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
ENVIRONMENTAL STUDIES

Instruction : 4 Periods per week	Semester Exam Marks :70	Subject Reference Code **CE 2090**
Credits : 2	Sessional Marks :30	Duration of Sem Exam : 3 Hr

COURSE OBJECTIVES	COURSE OUTCOMES
the students will	*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; use and over utilization of surface and ground water, 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, streams, lakes, rivers, oceans, estuaries).

UNIT-III : **Biodiversity:** Genetic species and ecosystem diversity, bio-geographical classification of India. 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 management.

Environment Protection Act: Air, water, forest and wild life acts, issues involved in enforcement of environmental legislation.

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*, Wiley Eastern Ltd.
5. Odum E.P., *Fundamentals of Ecology,* W.B. Sunders Co., USA.
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.

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 2260**
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)

Structure Charts: representing high level design of an application using structure charts
GNU Make: writing build scripts using gnu make
GDB: debugging of source code using GDB
Eclipse: Introduction to Eclipse, Installation, Configuring Eclipse to use GNU Make, GDB and GCC, Compiling
Building and Running C, C++ projects using eclipse.

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
MICROPROCESSOR LAB

Instruction : 3Periods per week	Semester Exam Marks :50	Subject Reference Code **IT 2151**
Credits : 2	Sessional Marks :25	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
the students shall:	**student will be able to:**
Learn the instruction set and interfacing techniques of 8085 microprocessor and 8051 microcontroller and its usefulness to embedded system applications	1. Write programs using 8085 microprocessor and 8051 microcontroller 2. Write programs for interfacing stepper motors, LED, LCD displays, keyboard etc. 3. Write programs for developing an embedded system application.

1. Tutorials on 8085 & 8051 Programming.
2. Interfacing and programming of 8255. (E.g. traffic light controller).
3. Interfacing and programming of 8254.
4. Interfacing and programming of 8279.
5. A/D and D/A converter interface.
6. Stepper motor interface.
7. Display interface.

Note: Adequate number of programs covering all the instructions of 8085 & 8051 instruction set should be done on the 8085 microprocessor & 8051 Microcontroller trainer kits.

SYLLABUS FOR BE 2/4 - SECOND SEMESTER
JAVA PROGRAMMING LAB

Instruction : 3Periods per week	Semester Exam Marks :50	Subject Reference Code **IT 2161**
Credits : 2	Sessional Marks :25	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Develop an application using Java (object oriented programming techniques).	1. Incorporate OOPs concept by implementing exception handling, multithreading, packages. 2. Use "collections" to organize data in different ways. 3. Create web application involving GUI with AWT, Applet and Swings.

1. A program to illustrate the concept of inheritance,
2. A program to illustrate the concept of dynamic polymorphism
3. A program to illustrate the concept of abstract class
4. A program to illustrate multithreading
5. A program to illustrate the concept of thread synchronization.
6. A program using String Tokenizer.
7. A program using Collection classes and Interfaces
8. A program to illustrate the usage of filter
9. A program to illustrate the concept of Buffered I/O streams.
10. An application involving GUI with different controls, menus and event handling.
11. A program to illustrate the concept of swings.

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
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 5th edition, McGraw Hill Publishing, 2010.

Note: Depending on the amount of work done in each activity and submission of the record, marks / grade will be awarded.

With effect from the academic year 2015-16

SYLLABUS FOR BE 2/4 - SECOND SEMESTER

MINI PROJECT-II

Instruction : 3Periods per week	Semester Exam Marks :-	Subject Reference Code **IT 2175**
Credits : 1	Sessional Marks :25	Duration of Sem Exam : 3 Hr

Course Objectives	**Course Outcomes**
students shall:	**student will be able to:**
Develop and implement a project using any of the programming languages/simulation tools/electronic components.	1. Develop effective solutions to various computing problems by applying the theoretical knowledge gained. 2. Implement projects and demonstrate them using presentations and technical reports

- The students are required to implement two projects (one hardware related and the other software related) from project exercises given in the suggested readings and reference books of the theory subjects.
- During the implementation of the projects, Personnel Software Process (PSP) has to be followed.
- Two reviews will be conducted.
- Report of the project work has to be submitted for evaluation.

Note: Depending on the amount of work done in each activity and submission of the record, marks / grade will be awarded.

Department of Civil Engineering

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER

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

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
• 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.