VASAVI COLLEGE OF ENGINEERING (Autonomous)

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana, India

(Sponsored by Vasavi Academy of Education)

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DEPARTMENT OF INFORMATION TECHNOLOGY

Date: 04.06.2015

Minutes of the meeting of Board of Studies, Information Technology department, held at 8.30 AM on 04.06.2015 (Thursday) at the Department of Information Technology, Vasavi College of Engineering, Ibrahimbagh, Hyderabad.

Members Presents

Dr. N. Vasantha	Chairman & Head
Dr. K. Sri Rama Murthy,	OU nominee
Prof. S. Ramachandram	Subject expert
Dr. Asha Rani	Subject expert
Mr. Raju Kanchibhotla	Industry representative
Mr. P. Vijay Kumar	PG alumnus
Mrs. S. Aruna	Faculty members
Ms. S. Rajyalaxmi	
Ms. Ch. Pavani	
Mr. G. Rajashekhar	
Mr. M. Vishnu Chaitanya	
Ms. R. Bhawana	

The following members of Board of Studies could not attend the meeting

1. Mr. K. Shyam Sunder Reddy

Chairman welcomed the members, gave an introduction to the IT department and the faculty.

The following points were discussed

1. Discussion on Course structure, scheme of examination for 4 years.
2. Discussion on B.E theory and laboratory syllabus for Second Year.

In this discussion the members suggested the following

1. In of Second Year Second Semester, Microprocessors & Microcontrollers, in the last unit RTOS can be removed as students may not have sufficient knowledge of operating systems concepts.
2. In Finishing School the students may be given an opportunity to present their views on the core subjects they are learning. The opportunity can be provided by way of Presentations and Group Discussions. Also aspects of personality development can be introduced. The technical content of Finishing school can be based on the Feedback from Alumni & Industry.
3. Electives can be introduced from Third year First Semester onwards giving an opportunity for the students in selecting different streams of their interest such as Networking, Security, E-commerce, Embedded Systems etc.
4. Where ever possible instead of mentioning 8085 can be mentioned as 8-bit processor, instead of using proprietary names.

(Dr. K. Sri Rama Murthy)
OU nominee

(Prof. S. Ramachandram)
Subject Expert

(Dr. Asha Rani)
Subject Expert

(Mr. Raju Kanchibhotla)
Industry Representative

(Mr. P. Vijay Kumar)
PG Alumnus

(Dr. N. Vasantha)
Chairman & Head

Resolutions: The following resolution have been made in the meeting

In summary, the members present have agreed for the proposed syllabus for Second Year I Semester & Second Semester. They suggested the students may be given an opportunity for selecting their streams of interest from Third Year onwards.

Meeting concluded with vote of thanks.

(Dr. K. Sri Rama Murthy)
OU nominee

(Prof. S. Ramachandram)
Subject Expert

(Dr. Asha Rani)
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(Mr. Raju Kanchibhotla)
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(Mr. P. Vijay Kumar)
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(Dr. N. Vasantha)
Chairman & Head

DEPARTMENT OF INFORMATION TECHNOLOGY
VASAVI COLLEGE OF ENGINEERING

BOS Meeting on 04-06-2015 (Thursday) at 08:30 am

S.No	Name and Designation of the member	Category	Affiliation	Signature
1	Dr. N. Vasantha	Chairman, BOS	VCE	
2	Dr. K. Sri Rama Murthy,	OU nominee	IIT,Hyd	
3	Prof. S. Ramachandram	Subject Expert	OU	
	Dr. Asha Rani	Subject Expert	JNTU	04/6/15
5	Mr. Raju Kanchibhotla	Industry	Logic Designers, Hyd.	04/06/15
6	Mr. P. Vijay Kumar	PG Alumnus	Synopsys, Hyd.	04/06/15
7	Mrs. S. Aruna	Associate Professor	VCE	4/6/15
8	Ms. S. Rajyalaxmi	Assistant Professor	VCE	
9 5	Ms. Ch. Pavani	Assistant Professor	VCE	
10	Mr. K. Shyam sunder Reddy	Assistant Professor	VCE	ABSENT
11	Mr. G. Rajashekhar	Assistant Professor	VCE	
12	Mr. M. Vishnu Chaitanya	Assistant Professor	VCE	
13	Ms. R. Bhawana	Assistant Professor	VCE	

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

S No.	Code	Subject	Scheme of Instruction				Scheme of Examination			
			Periods per week				Duration in Hrs	Maximum Marks		Credits
			L	T	D	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 - I	2				3	70	30	1
8	HS2170	Finishing School : Communication skills- I	4				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**		**9**		**660**	**285**	**27**
		Grand Total	**38**				**-**	**945**		**27**

B.E. II YEAR -II-Semester

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	HS2270	Finishing School : Communication skills - II	4				3	70	30	2
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**		570	300	
		Grand Total	**36**					**870**		**25**

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DEPARTMENT OF INFORMATION TECHNOLOGY

Discrete Mathematics
(B.E. 2/4 IT branch, I-Semester)

Instruction : 4 Periods / week	**Semester End Exam Marks : 70**	**Subject Reference Code : IT2010**
Credits : 3	**Sessional Marks: : 30**	**Duration of Semester End Exam : 3 Hours**

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	***At the end of the course students will be able to:***
1. ***Understand*** Propositions and their equivalences, predicates and quantifiers and learn various proof strategies. 2. ***Study*** the concepts of number theory such Modular Arithmetic, Congruences etc. 3. ***Understand*** the basics of counting, combinatorics, and various methods of solving Recurrence relations. 4. ***Understand*** Relations, Equivalence relations, Posets and Hasse diagrams. 5. ***Analyze*** the concepts of Graphs and trees.	1. ***Use*** logical notation to define and reason about fundamental mathematical concepts and ***synthesize*** induction hypothesis and simple ***Induction*** proofs. 2. ***Prove*** elementary properties of modular arithmetic and explain their applications in Computer Science 3. ***Calculate*** number of possible outcomes of elementary combinatorial processes such as permutations and combinations ***Model*** and analyze computational processes using analytic and combinatorial methods. 4. ***Prove*** whether a given relation is an equivalence relation/poset and will be able to draw a Hasse diagram. 5. ***Apply*** graph theory models of data structures and state machines to solve problems of connectivity.

UNIT – I

Logic: Logic- Logical connectives- Propositional equivalences– Predicates and quantifiers – Nested quantifiers.

Mathematical Reasoning, Induction: Proof Strategy- Methods of Proofs- Mathematical Induction- Second Principle of Mathematical Induction.

UNIT – II

Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic. Integers and Algorithms- Euclidean Algorithm. Applications of Number Theory-Linear Congruences- Fermat's Little Theorem- Public key cryptography- RSA Encryption and Decryption.

UNIT – III

Counting: Basics of counting- Pigeonhole principle- Permutations and combinations – Binomial Coefficients- Pascal's Identity- Vandermonde's Identity- Generalized Permutations and combinations.

Advanced Counting Techniques: Recurrence relations: Solving Recurrence Relations- Linear Homogeneous and Non-Homogeneous Recurrence relations - Divide and conquer relations Generating function– Counting Problems and Generating Functions- Using Generating Functions to prove identities and to solve Recurrence Relations- Principle of Inclusion – Exclusion (without proof).

16/7/16 16/7/16

UNIT – IV

Relations: Relations – Properties- n-ray relations and applications, Representing relations – Closures. Equivalence Relations. Partial Orderings- Poset- Hasse diagrams.

UNIT –V

Graph Theory: Introduction- Types of graphs- Graph terminology- Basic theorems- Representing Graphs and Graph Isomorphism. Connectivity- Euler and Hamiltonian paths. Planar graphs- Euler's Formula- Graph coloring- Definitions- Theorems.

Trees- Introduction to Trees- Properties of Trees- Spanning Trees- Theorems (without proofs), Algorithms for constructing Spanning trees.

Suggested Reading:

1. Kenneth H.Rosen – Discrete Mathematics and its application – 5th edition, Mc Graw – Hill, 2003.
2. J. K. Sharma, Discrete Mathematics, Second edition, Macmillan, 2005.
3. J.P.Trembly, R.Manohar, Discrete Mathematical Structure with Application to Computer Science, Mc Graw- Hill – 1997.
4. Joel. Mott. Abraham Kandel, T.P.Baker, Discrete Mathematics for Computer Scientist & Mathematicans, Prentiee Hail N.J., 2nd edn, 1986.
5. R.K Bisht, H.S.Dhami - Discrete Mathematics, Oxford University Press, 2015

16/7/16 16/7/16 == ** == 16/7/16

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DEPARTMENT OF INFORMATION TECHNOLOGY

Microelectronics
(B.E. 2/4 IT branch, I-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2020
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course student will be able to:**
Learning the different electronic devices, characteristics and their applications	1. Explain the principle of operation of p n junction diode and to design small applications such switch, rectifier etc. 2. Distinguish hole current and electron current and hence the working of BJT and analyze its operation as amplifier and switch 3. List the advantages of MOSFET over JFET and implement Boolean logic functions using CMOS logic 4. List the advantages of Negative feedback amplifiers and also describe the working of different types of Oscillator circuits. 5. 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.

Suggested Reading :

1. Jacob Millman, Christos C Halkais, Satybrata jit, Electronic Devices and Circuits,Mc Graw Hill India Private Ltd, 3rd Edition
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.

References

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

JCH/DIT

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DEPARTMENT OF INFORMATION TECHNOLOGY

Digital Electronics & Logic Design
(B.E. 2/4 IT branch, I-Semester)

Instruction: 5 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2030
Credits : 4	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	**Course Outcomes**
The course will enable the students to:	**At the end of the course 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.	1. 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. 2. Explain the internal architectures of FPGA's, ASIC's, PLD's. Design combinational circuits (arithmetic circuits, code converters), simulating using HDL. 3. Design basic sequential blocks such as flipflops, registers etc. 4. Design and analyze sequential digital circuits. 5. 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

Suggested Reading:

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

References:

4. John F. Walkerly, Digital Design : Principles and Practices, Pearson India, 4th Edition.
5. Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss, Digital Systems: Principles and Applications, Pearson India, 10th Edition.

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Data Structures
(B.E. 2/4 IT branch, I-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2040
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course student will be able to:**
The objective of the course is to explore efficient storage mechanisms for easy access, design and implementation of various data structures	1. Apply different linear data structures to solve problems 2. Illustrate the usage of linked lists for various applications 3. Demonstrate the usage of non-linear data structures – graphs & trees 4. Apply different sorting and hashing techniques to a given problem 5. 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.

Jun-2017

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DEPARTMENT OF INFORMATION TECHNOLOGY

Signals & Systems

(B.E. 2/4 IT branch, I-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2050
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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 Fourie 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 o Undersampling: Aliasing, Reconstruction of a signal from its Samples using Interpolation. Quantization. MATLAE Examples: Programs on Laplace Transform and Sampling

UNIT – V The Discrete Time Fourier Transform and Z transform

The Discrete Time Fourier Transform, Properties of Discrete Time Fourier Transform, Analysis of Systems characterized b 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

Suggested Reading:

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.
3. Simon Haykin, Barry Van Veen, Signals and Systems, Wiley, 2nd Edition.

References:

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.
7. H.P. Hsu, Signals and Systems, Schaum's Outline Series, Mc Graw Hill Education (India) Private Limited, 2nd Editio

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DEPARTMENT OF INFORMATION TECHNOLOGY

Computer Organization
(B.E. 2/4 IT branch, I-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2060
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course student will be able to:**
Gain knowledge about the architectural details of a computer, its programming and interfacing the different peripherels.	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 memoy 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 Multicomputers, 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

Suggested Reading:

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.

References :
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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Basic Electronics Lab
(B.E. 2/4 IT branch, I-Semester)

Instruction: 3 Practicals / week	**Semester End Exam Marks :** 50	**Subject Reference Code :** IT2071
Credits : 2	**Sessional Marks** :25	**Duration of Semester End Exam :** 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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 equipments. 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: All the experiments are compulsory.
Note: Depending on the amount of work done in each activity and submission of the record, marks / grade will be awarded.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Data Structures Lab
(B.E. 2/4 IT branch, I-Semester)

Instruction: 3 Practicals / week	**Semester End Exam Marks** : 50	**Subject Reference Code** : IT2081
Credits: 2	**Sessional Marks** :25	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course student will be able to:**
Develop skills in design and implementation of abstractions of various linear and non linear data structures and their practical applications.	1. Perform various operations on data structures such as stack, queues, 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.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

Mini Project-I
(B.E. 2/4 IT branch, I-Semester)

Instruction: 3 Practicals / week	**Semester End Exam Marks** : ---	**Subject Reference Code** : IT2095
Credits: 1	**Sessional Marks** :25	**Duration of Semester End Exam** : ---

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Probability & Random Processes
(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2100
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

Suggested Reading:

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

References:

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

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DEPARTMENT OF INFORMATION TECHNOLOGY

Probability & Random Processes
(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2100
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

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2. Peyton Z. Peebles, Probability, Random Variables and Random Signal Principles, Mc Graw Hill Education (India) Private Limited, 4th Edition

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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

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DEPARTMENT OF INFORMATION TECHNOLOGY

Microprocessors & Microcontroller
(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2110
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

Suggested Reading:

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.

References:

3. Wayne Wolf, Computers as components: Principles of Embedded Computing Design, Elseiver, 2nd Edition.
4. David E. Simon, An Embedded Software Primer, Pearson India, First Edition.
5. Raj Kamal, Embedded Systems : Architecture, Programming and Design, Mc Graw Hill Education (India) Private Limited, 3rd Edition.
6. Ajay V. Deshmukh, Micro controllers: Theory and Applications, Mc Graw Hill Education (India) Private Limited, First Edition.
7. Frank Vahid, Tony Givargis, Embedded System Design: A Unified Hardware/ Software Introduction, Wiley Publishers, 3rd Edition.

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DEPARTMENT OF INFORMATION TECHNOLOGY

OOP USING Java
(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2120
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hrs

Course Objectives	**Course Outcomes**
The course will enable the students to:	**At the end of the course 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, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

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

Suggested Reading:
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.
Reference Reading:
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Data Communication
(B.E. 2/4 IT branch, II-Semester)

Instruction: 5 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2130
Credits : 4	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

Suggested Reading:

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.

References:

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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

DESIGN & ANALYSIS OF ALGORITHMS

(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2140
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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,

Suggested Reading:

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.

References:

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.

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VASAVI COLLEGE OF ENGINEERING

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9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL STUDIES

SYLLABUS FOR BE 2/4 - SECOND SEMESTER

Instruction : 4 Periods per week	Semester End Exam Marks : 70	Subject Reference Code : CE 2090
Credits : 3	Sessional Marks : 30	Duration of Semester End Exam : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course 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. [illegible] 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 :

Text book:

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.

Suggested Reading

1. Suresh K. Dhameja, *Environmental Studies*, S.K. Kataria & Sons, 2010.
2. De A.K., *Environmental Chemistry*, New Age International, 2003.
3. Odum E.P., *Fundamentals of Ecology*, W.B. Sunders Co., USA, 2004.
4. Sharma V.K., *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.
5. Rajagopalan R., *Environmental Studies*, Second Edition, Oxford University Press, 2013.

SYLLABUS IS APPROVED BY MEMBERS OF BOS

SIGNATURES:

Dr. K.V.L. Subramaniam
OU Nominee

Dr. K. Srinivasa Raju
Subject Expert

Dr. M. Kumar
Subject Expert

Dr. R. Pradeep Kumar
Subject Expert & Alumni

Er. P. Surya Prakash
Industry Representative

Dr. B.Sridhar
Chairman, BOS

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DEPARTMENT OF INFORMATION TECHNOLOGY

Microprocessor Lab
(B.E. 2/4 IT branch, II-Semester)

Instruction: 3 Practicals / week	**Semester End Exam Marks** : 50	**Subject Reference Code** : IT2151
Credits : 2	**Sessional Marks** :25	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Java Programming Lab
(B.E. 2/4 IT branch, II-Semester)

Instruction: 3 Periods / week	**Semester End Exam Marks** : 50	**Subject Reference Code** : IT2161
Credits : 2	**Sessional Marks** :25	**Duration of Semester End Exam** : 3 Hours

Course Objectives	**Course Outcomes**
The course will enable the students to:	**At the end of the course 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,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.

Suggested Reading:

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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Mini Project-II
(B.E. 2/4 IT branch, II-Semester)

Instruction: 3 Practicals / week	**Semester End Exam Marks** : ---	**Subject Reference Code** : IT2175
Credits : 1	**Sessional Marks** :25	**Duration of Semester End Exam** : ---

Course Objectives	**Course Outcomes**
The course will enable the students to:	**At the end of the course 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.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Probability & Random Processes
(B.E. 2/4 IT branch, II-Semester)

Instruction: 4 Periods / week	**Semester End Exam Marks** : 70	**Subject Reference Code** : IT2100
Credits : 3	**Sessional Marks** :30	**Duration of Semester End Exam** : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	**At the end of the course 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.

Suggested Reading:

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

References:

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