Faculty of Engineering &Technology
KAKATIYA UNIVERSITY, WARANGAL -506009
Department of Computer Science & Engineering
Department of Information Technology

B.TECH IN ENGINEERING
CSE/IT
III SEMESTER

Sl. No	Category/ Code	Course Title	L	T	P	Credits
1	MC-210	Environmental Science	2	0	0	0
2	BSC105	Mathematics – III	3	0	0	3
3	ESC-301	Analog Electronics	3	1	0	4
4	PCS-301	Data Structures using "C"	3	1	0	4
5	PCS-302	Computer Architecture & Organization	3	1	0	4
6	ECC-301L	Analog Electronics Lab	0	0	3	1.5
7	PCS-301L	Data Structures Lab	0	0	4	2
8	PCS-303L	IT Workshop using "C" Lab.	-	-	3	1.5
		Total Contact Hours	27			20

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B. Tech. (CSE/IT) III SEMESTER
MC-210
ENVIRONMENTAL SCIENCES

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
2	0	0	0	External Marks: 70

UNIT–I (8)

Introduction to Environmental Science: Environment and society, major environmental issues: Ozone layer depletion, Acid rains, global climate change etc, sustainable development, Environmental impact assessment, environmental management

Natural Resources Utilization and its Impacts: Energy, minerals, water and land resources, Resource consumption, population dynamics, urbanization.

UNIT–II (8)

Ecology and Biodiversity: Energy flow in ecosystem, food chain, nutrient cycles, eutrofication value of biodiversity, biodiversity at global, national and local levels, threats for biodiversity, conservation of biodiversity.

UNIT–III (8)

Water Pollution: Sources, types of pollutants and their effects, water quality issues, contaminant transport, self-purification capacity of streams and water bodies, water quality standards, principles of water and wastewater treatment.

UNIT–IV (8)

Air Pollution: Sources, classification and their effects, Air quality standards, dispersion of pollutants, control of air pollution, automobile pollution and its control.

UNIT–V (8)

Solid Waste Management: Sources and characteristics of solid waste, effects, Collection and transfer system, disposal methods.

Text Books:

1. M. Chandrasekhar, Environmental science, Hi Tech Publishers, 2009.
2. P.N. Modi (2006), Water supply Engineering – Environmental Engineering (Vol. I) – Standard Book House.
3. Gerard Kiely, Environmental Engineering, McGraw Hill Education Pvt Ltd, Special Indian Edition, 2007.

References:

1. W P Cunningham, M A Cunningham, Principles of Environmental Science, Inquiry and Applications, Tata McGraw Hill, Eighth Edition, 2016.

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B. Tech. (CSE/IT) III SEMESTER
BSC-105
Mathematics - III
STATISTICS, PROBABILITY, AND NUMERICAL TECHNIQUES

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	0	0	3	External Marks: 70

Module1: Statistical Methods

Introduction, Collection of Data, Graphical Representation, Measures of Dispersion, Moments, Skewness, Kurtosis, Correlation, Coefficient of Correlation, Lines of Regression.

(Sections 25.1, 25.2, 25.3, 25.6, 25.9, 25.10, 25.11, 25.12, 25.13, 25.14 of Text Book)

Module2: Probability & Distributions

Probability, Addition Law of Probability, Independent Events, Baye's Theorem , Random Variable, Continuous Probability Distribution, Expectation, Moment Generating Function, Binomial Distribution , Poisson Distribution, Normal Distribution, Exponential Distribution.
(Sections26.1,26.4,26.5,26.6,26.7,26.9,26.10,26.11,26.14,26.15,26.16,26.19(6) of Text Book)

Module3: Numerical Techniques-I

Solution of Algebraic and Transcendental Equations, Principle of Least Squares, Method of Least Squares, Fitting of Other Curves, Finite Differences, Forward Differences, Backward Differences.
(Sections 28.2, 24.4, 24.5, 24.6, 30.2, 30.2(1), 30.2(2) Of Text Book)

Module4: Numerical Techniques-II

Central Differences, Other Difference Operators, Newton's Interpolation Formulae, Gauss's Forward Interpolation Formula, Interpolation with Unequal Intervals, Numerical Differentiation.
Sections 29.7, 29.4, 29.6, 29.7(1), 29.9, 30.1.of Text Book)

Module5: Numerical Techniques-III

Numerical Integration, Trapezoidal Rule, Simpson's one –third Rule, Simpson's three-eight Rule, Weddle's Rule, Solution of Simultaneous Linear Equations (Iterative Methods)

(Sections 30.4, 30.6, 30.7, 30.8, 30.10, 28.5 of Text Book)

Text Book:

 B.S Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publications.

References

1. Erwin Kreyszig, Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons
2. S.C. Gupta, V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand &Sons
3. S.S. Sastry, Introductory Methods of Numerical Analysis, PHI Learning Pvt. Ltd.

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B. Tech. (CSE/IT) III SEMESTER
ESC 301
ANALOG ELECTRONICS

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT-I

Review of Semiconductor Devices: P-N junction and V-I characteristics, static and dynamic resistance, effect of temperature on V-I characteristics, Avalanche and Zener breakdown, Zener diode

Regulated power supply: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with capacitive and inductive Filters, Voltage regulator, Block diagram of switched mode power supply

UNIT-II

Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations and characteristics, Transistor as an amplifier and switch

DC Analysis: Operating point, DC & AC load lines, Biasing - Fixed Bias, Self Bias, Bias Stability, Thermal runaway and stabilization
UNIT-III

Field Effect Transistor (FET): Construction, Principle of Operation, V-I Characteristic and DC analysis of JFET, MOSFET, FET application as switch and amplifier.
Frequency response of BJT and FET RC coupled amplifier,

UNIT-IV

Feedback: Advantages of negative feedback and effect of negative feedback on amplifier characteristics

Positive feedback: Condition for Oscillations, RC type Oscillators-RC phase shift and Wien-bridge Oscillators, LC type Oscillators –Hartley and Colpitts Oscillators, Crystal Oscillator.

UNIT-V

Operational Amplifier: Block diagram and Ideal characteristics, pin diagram and practical characteristics of IC 741, Op-amp application as adder, subtractor, difference amplifier, differentiator, integrator and square wave (clock pulse) generator (Qualitative treatment only)

Timer: 555 timer as mono-stable and astable mode and its basic application as square wave generator. (Qualitative treatment only)

TEXT BOOKS:

1. Jacob Millman& Christos C. Halkias, *Electronic Devices and Circuits*, McGraw Hill Education.
2. Robert L. Boylestead, Louis Nashelsky, *Electronic Devices and Circuits theory*, 11th Edition, 2009, Pearson
3. Roy Choudhary, Shail Jain, *Linear Integrated Circuits*, New Age International, New Delhi.

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B. Tech. (CSE/IT) III SEMESTER
PCS – 301
DATA STRUCTURES USING " C"

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT-I

Introduction
Introduction to data structure, types of data structures, revision of arrays, memory representation of arrays, operations on arrays, static versus dynamic memory allocation, pointers, self-referential structure Time complexity.

UNIT-II

Linked lists
Single linked list representation, operations on single linked list, Circular linked list and its operations, Doubly linked list and its operations, applications of lists, polynomial representation using lists.

UNIT-III

Stack-Queue (Linear Data structures)
Definition of stack, operations on stack, implementation of stack using arrays and linked lists, application of stack, postfix evaluation using stack, conversion of infix to postfix and prefix expressions.

Definition of queue, operations on queue, implementation of queue using arrays and linked list, applications of queue, Circular queue and priority queue.

UNIT-IV

Trees-Graphs (Nonlinear Data structures)
Definition of trees, Terminology on trees, binary tree, binary search tree and its operations, tree traversal techniques.

Definition of graph, terminology on graphs, representation of graphs, graph traversal techniques, spanning tree, minimum spanning tree algorithms.

UNIT-V

Searching-Sorting
Searching: Linear search, Binary search
Sorting: Bubble sort, Insertion sort, selection sort, quick sort and merge sort.

Text Books:

1. Ellis Horowitz, Sartaj Sahani, Dinesh Metha, "Fundamentals of data structures in C", Galgotia Publications Pvt. Ltd, ISBN 81-203-1874-9.
2. D. Samanta, "Classic data structures", Printice Hall India, ISBN 81-203-1874-9.

Reference Books:

1. Data Structures Using C, SIXTH edition, E. Balaguru Swamy, Tata McGraw-Hill, ISBN 1-25-9029544-9.
2. Fundamentals Of Data Structures In C, Horowitz, Sahni, Universities Press ISBN 10: 8173716056

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B. Tech. (CSE/IT) III SEMESTER
PCS – 302
COMPUTER ARCHITECTURE AND ORGANIZATION

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 30
3	1	-	4	External Marks: 70

UNIT-I

Review of Computer Systems: The Evolution of Computers, Basic Functional Units and Operation of Digital Computers, Performance Measures.

Number Representation: Integer, Signed, Unsigned, 1's Complement, 2's Complement, r's Complement, Addition and Subtraction of Signed Numbers, Overflow in Integer Arithmetic, Fixed and Floating Point Representation, IEEE 754 Representation, BCD , Gray code.

Instructions: Memory Location and Address: Byte addressability, Big endian & Little endian assignments, Word alignment, Accessing Numbers, Characters and Character strings. Addressing modes, Instruction Format: Three, Two, One, Zero Address Instructions, Risk Instructions, Modes of Instructions, Instruction Sequencing, Assembly Language, Stacks and Queues, Subroutines.

UNIT-II

Central Processing Unit: Fundamental Concepts, Execution of Complete Instruction, Control Unit, Micro Programming Control Unit, Hardwired Control Unit, Study of 8088, Power Pc Processor.

Memory Unit: Basic Concepts of Memory, Memory Hierarchy, Technology: RAM, ROM, Flash Memory, EPROM, Cache Memory: Different Mapping Functions, Replacement Algorithms,

Performance Considerations: Interleaving, Hit Rate, Miss Penalty, Caches on Processor Chip, Virtual Memory: Address Translation, Associative Memory, Page replacement algorithms. Secondary Storage: Magnetic Hard disk, Optical Disk, Magnetic Tape.

UNIT-III

Computer Arithmetic: Addition & Subtraction of Signed Numbers, Carry look ahead adder, Multiplication of positive numbers, Booth's Algorithm, Fast Multiplication, Integer Division, Floating Point Arithmetic Operation: Addition, Subtraction, Multiplication & Division .

Input/Output Unit: I/O Interface: I/O Bus and Interface Modules, I/O Vs Memory Bus, Isolated I/O, Memory Mapped I/O, Synchronous & Asynchronous Data Transfer, Modes of Data Transfer: Programmed I/O, Interrupt initiated I/O, Priority Interrupt: Daisy Chaining Priority, Parallel Priority, Interrupt, Priority Encoder, Interrupt Cycle, Software Routine, DMA, Interface Circuit: Parallel, Port, Serial Port, Standard I/O Interfaces: PCI Bus, SCSI Bus, Universal Serial Bus.

UNIT-IV

Computer Peripherals: Input Devices: Keyboard, mouse, joystick, track ball, touch pad , scanners. Output Devices: Video displays, flat panel display, printers, graphics accelerators.

Pipelining: Basic concepts, Data & instruction hazards, Influence on instruction sets, Data path and control considerations, Super scalar operations.

Introduction to RISC, CISC. Introduction to parallel processing, interprocessor communication & synchronization

UNIT-V

Large Computer Systems: Forms of Parallel Processing, Array Processors, The Structure of General purpose multiprocessor, Interconnection Networks, Memory Organization, Program Parallelism and Shared Variables

Text Books:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky Computer Organization, Tata McGraw Hill, 5/e

Reference Books:

1. Morris M. Mano, Computer System Architecture, PHI, 3rd Edition
2. John P. Hayes, Computer Architecture and Organization, McGraw Hill, 3/e
3. Andrew S. Tanenbaum, Structured Computer Organization, 6/e

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B. Tech. (CSE/IT) III SEMESTER
ESC – 301L
ANALOG ELECTRONICS - LAB

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 25
-	-	3	1.5	External Marks: 50

1) Characteristics of PN junction and Zener diode

2) Full wave rectifier with and without filters

3) Characteristics of common base and common emitter BJT amplifier

4) Frequency response of RC coupled amplifier

5) Characteristics of common source FET amplifier

6) Design of different oscillators using BJT and FET

7) Op-amp applications as adder/Substractor,

8) Op-amp applications as differentiator/integrator

9) 555 timer astable mode of operation i.e. square wave generator

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B. Tech. (CSE/IT) III SEMESTER
PCS– 301L
DATA STRUCTURES USING "C" LAB

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 25
-	-	3	1.5	External Marks: 50

LIST OF EXPERIMENTS

1. Program to implement array operations.

2. Program to represent sparse matrix using array, and display its transpose.

3. Program to perform addition of two sparse matrices.

4. Program to implement stack and its operations using arrays.

5. Program to implement stack operations using arrays.

6. Program to implement multiple stacks in single array.

7. Program to convert infix expression to postfix expression.

8. Program to convert given infix expression to prefix expression.

9. Program to evaluate given postfix expression.

10. Program to implement queue operations using arrays.

11. Program to implement circular queue operations using arrays.

12. Program to create single linked list and implement its operations.

13. Program to implement double linked list and its operations.

14. Program to implement stack and queue using linked list.

16. Program to implement binary search tree and traversing techniques.

15. Program for linear search and binary search.

16. Programs for bubble sort, selection sort, insertion sort, quick sort and merge sort.

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B. Tech. (CSE/IT) IV SEMESTER
PCS 303L
IT WORKSHOP - LAB

Teaching Scheme				Examination Scheme
L	T	P	C	Internal Marks: 25
-	-	3	1.5	External Marks: 50

LIST OF EXPERIMENTS

PC Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Task 6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

LaTeX and Word

Task 1 – **Word Orientation**: The mentor needs to give an overview of LaTeX and Microsoft (MS) office2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4 : Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

Task 3: Performance Analysis - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

LaTeX and MS/equivalent (FOSS) tool Power Point

Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Task 2: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

Reference books:

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dreamtech.

2. The Complete Computer upgrade and repair book, 3rd Edition, Cheryl A Schmidt, WILEY Dreamtech.

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

4. PC Hardware and A+Handbook, Kate J. Chase, PHI (Microsoft).

5. LaTeX Companion, Leslie Lamport, PHI/Pearson.

6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and KenQuamme. – CISCO Press, Pearson Education.

7. IT Essentials PC Hardware and Software Labs and StudyGuide Third Edition by Patrick Regan – CISCO Press, Pearson Education.

8. Microsoft Office 2007: The Missing Manual - Chris Grover, Mathew MacDonald, E.A. Vander Veer O'reilly Media.

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