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**TOTAL** 18 2 9 26

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**TOTAL** 18 1 9 25
Aim:
To facilitate the understanding of the principles and to cultivate the art of formulating physical problems in the language of mathematics.

Objectives:
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
- To acquaint the student with Fourier transform techniques used in wide variety of situations in which the functions used are not periodic
- To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes
- To develop Z- transform techniques which will perform the same task for discrete time systems as Laplace Transform, a valuable aid in analysis of continuous time systems

1. FOURIER SERIES 9+3

2. FOURIER TRANSFORM 9+3

3. PARTIAL DIFFERENTIAL EQUATIONS 9+3
Formation – Solutions of first order equations – Standard types and Equations reducible to standard types – Singular solutions – Lagrange’s Linear equation – Integral surface passing through a given curve – Solution of linear equations of higher order with constant coefficients.

4. APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 9+3
Method of separation of Variables – Solutions of one dimensional wave equation and one-dimensional heat equation – Steady state solution of two-dimensional heat equation – Fourier series solutions in Cartesian coordinates.

5. Z – TRANSFORM AND DIFFERENCE EQUATIONS 9+3

L: 45, T: 15, Total : 60

TEXT BOOKS
REFERENCES

   Lakshmi Publications (P) Limited, New Delhi.

EC 9212 COMMUNICATION TECHNIQUES 3003

1. ANALOG MODULATION 9


2. DIGITISATION 9

   Low pass sampling theorem – Quantisation - PAM – Line coding - PCM, DPCM, DM, ADPCM and ADM, Channel Vocoder,— Time Division Multiplexing, frequency Division Multiplexing

3. DIGITAL MODULATION AND TRANSMISSION 9

   Phase shift keying – BPSK, DPSK, QPSK - Principles of M-ary signaling M-ary PSK & QAM – Comparison, ISI – Pulse shaping – Duo binary encoding - Cosine filters – Eye pattern, equalizers

4. INFORMATION THEORY AND CODING 9

   Measure of information – Entropy – Source coding theorem - Shannon-Fano coding, Huffman Coding, LZ Coding– Channel capacity – Shannon-Hartley law – Shannon’s limit- Error control Codes – Cyclic codes, Syndrome calculation – Convolutional Coding, Sequential and Viterbi decoding

5. SPREAD SPECTRUM AND MULTIPLE ACCESS 9

   PN sequences – properties – m-sequence –DSSS –Processing gain, Jamming — FHSS –Synchronisation and tracking - Multiple Access – FDMA, TDMA, CDMA

TEXT BOOK:

2. S. Haykin “Digital Communications” John Wiley 2005

REFERENCES:

2. H P Hsu, Schaum Outline Series - “Analog and Digital Communications” TMH 2006
Aim:
To provide a strong foundation in database technology and an introduction to the current trends in this field.

OBJECTIVES:
- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing techniques

1. INTRODUCTION


2. RELATIONAL MODEL


3. DATABASE DESIGN


4. TRANSACTIONS


5. IMPLEMENTATION TECHNIQUES

TEXT BOOKS:

REFERENCES:

IF 9201 COMPUTER ORGANIZATION 3 1 0 4

Aim: To understand the basics of digital design, the design of various components of the computer system and its organization.

Objectives:

- To understand the fundamentals of Boolean logic and functions.
- To design and realize these functions with basic gates, and other components using combinational and sequential logic.
- To understand the design and organization of a von-neumann computer system.
- To comprehend the importance of the hardware-software interface.

1. Digital Fundamentals 9 +3


2. Combinational and Sequential Circuits 9+3


3. Basic Structure of Computers 9+3

4. Processor Design 9 +3


5. Memory and I/O Systems 9 +3


TOTAL = 45+15

TEXT BOOKS:


REFERENCES:


CS 9203 PROGRAMMING AND DATA STRUCTURES II 3 0 0 3

Aim:
The aim is to introduce the concepts Object Oriented Programming and analysis the implementation of Advanced Data Structures using Object Oriented Programming Language.

Objectives:

• To introduce the concepts of Object Oriented Programming language.
• To introduce the concepts of Templates and Error Handling.
• To introduce the concepts of Advanced Data Structures.

Unit I 9

Unit II

Unit III

Unit IV
OO Perspective of List, Stack, Queue, and Search Tree ADTs – AVL Trees – Red Black Trees – Splay Trees – B-trees – Priority Queues (Heaps)

Unit V
Disjoint Set ADT – Graph Algorithms – Topological Sort – Shortest-Path Algorithm – Network Flow Problems – Minimum Spanning Tree – Applications of Depth-First Search

TEXT BOOKS:

REFERENCE BOOKS:

CS 9201 DESIGN AND ANALYSIS OF ALGORITHMS 3 0 0 3

Aim:
The aim is to introduce the basics of algorithm design paradigms and analysis to enable designing of efficient algorithms.

Objectives:

- To introduce the basic concepts of algorithm analysis
- To introduce the design paradigms for algorithm design
- To introduce the basic complexity theory.

UNIT I 9

UNIT II

UNIT III

UNIT IV

UNIT V

TEXT BOOKS

REFERENCE BOOKS:

CS 9205  DBMS LAB

Experiments in the following topics:
1. Data Definition, Manipulation of base tables and views
2. High level programming language extensions.
3. Front end tools
4. Forms
5. Triggers
6. Menu Design
7. Importing/Exporting Data
8. Reports.
9. Database Design and implementation (Mini Project).

CS 9206  Programming and Data Structures Lab II  0 0 3 2

Experiments in the following:

1. Data abstraction, Implementation of any one of the following List, Stack, Queue ADTs, using Header files, Separate compilation of implementation and application. Search ADT, Binary Search Tree, Header files, Separate compilation.

2. Use of Standard Template Library: Strings, Containers

3. Use of STL: Iterators

4. Operator Overloading

5. Templates,

6. Exception handling, Class Hierarchies

7. AVL Tree

8. Splay Tree

9. B Tree

10. Graph algorithms

CS 9207  ALGORITHMS LAB  0 0 3 2

1. Implementing simple recursive programs like Towers of Hanoi, Generating Permutations.

2. Implementation of simple sort algorithms.

3. Implementation of randomized quicksort algorithms.


7. Solving Simplex Method.

8. Implement String matching algorithms.
9. Implementation of programs Study of Benchmarking and analysis of algorithms for simple programs.

MA 9265 DISCRETE MATHEMATICS 3 1 0 4

AIM:

To extend student’s Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES:

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program.
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be aware of the counting principles
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.

1. Logic and Proofs 9 + 3


2. Combinatory 9 + 3


3. Graphs 9 + 3

Graphs and graph models – Graph terminology and special types of graphs - Representing graphs and graph isomorphism – connectivity – Euler and Hamilton paths.

4. Algebraic Structures 9 + 3

Algebraic systems – Semi groups and monoids – Groups-Subgroups and homomorphisms – Cosets and Lagrange’s theorem – Ring & Fields.

5. Lattices and Boolean algebra 9 + 3


L: 45, T: 15, Total : 60

TEXT BOOKS
REFERENCES


IT 9251 FORMAL LANGUAGES AND AUTOMATA 3 0 0 3

Aim:

To get fundamental idea on Automata and Languages

Objectives:

- A study of the formal relationships between machines, languages and grammar.

1. Automata


2. Regular Expressions and Languages

Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

3. Context-free Grammars and Languages


4. Properties of Context-free Languages

Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.

5. Deterministic Parsing


TOTAL = 45

Text Books:
IT 9252 EMBEDDED SYSTEMS 3 0 0 3

Aim: To understand hardware and the software aspects of embedded systems.

Objectives:

- To understand the architecture of embedded processors, microcontrollers, and peripheral devices.
- To appreciate the nuances of programming micro-controllers in assembly for embedded systems.
- To understand the challenges in developing operating systems for embedded systems.
- To learn about programming these systems in high-level languages such as C.

1. Embedded Computing 9


2. Memory and Input / Output Management 9

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupt handling.

3. Processes and Operating Systems 9

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.

4. Embedded C Programming 9

unaligned data and endianness – inline functions and inline assembly – portability issues.

5. Embedded System Development

Meeting real time constraints – Multi-state systems and function sequences.
Embedded software development tools – Emulators and debuggers. Design issues – Design methodologies – Case studies – Complete design of example embedded systems.

TOTAL = 45

TEXT BOOKS


REFERENCES


CS 9253 WEB TECHNOLOGY

Aim:
To provide an introduction to Java and basic Web concepts and enable the student to create simple Web based applications.

Objectives:

• To introduce the features of object oriented programming languages using Java
• To design and create user interfaces using Java frames and applets
• To have a basic idea about network programming using Java
• To create simple Web pages and provide client side validation
• To create dynamic web pages using server side scripting

Unit I
Java fundamentals – Class, Object – Inheritance – Polymorphism – Packages – Interfaces – Exception handling

Unit II
I/O – AWT – Event handling – Introduction to Threads - Basics of Networking –TCP and UDP sockets – Connecting to the Web

Unit III
Applets – JDBC – Swings – Remote Method Invocation

Unit IV

Unit V

Server side scripting – JSP – Servlets – Session management – Cookies

Total : 45

TEXTBOOK:


REFERENCE BOOKS:


CS 9252 OPERATING SYSTEMS

Aim: The course introduces the students to the basic principles of operating systems.

Objectives:

• To be aware of the evolution of operating systems
• To learn what processes are, how processes communicate, how process synchronization is done and how to manage processes
• To have an understanding of the main memory and secondary memory management techniques.
• To understand the I/O Subsystem
• To have an exposure to Linux and Windows 2000 operating systems

1. Operating Systems Overview


2. Process Management


3. Storage Management

4. I/O Systems


5. Case Study


TOTAL = 45

TEXT BOOKS:


REFERENCES:


CS 9254 SOFTWARE ENGINEERING 3 0 0 3

Aim:

The course is intended to give Software Engineering principles in classical sense.

Objectives:

- To be aware of a member of generic models to structure the software development process.
- To understand fundamental concepts of requirements engineering and requirements specification.
- To understand different notion of complexity at both the module and system level
- To be aware of some widely known design methods.
- To understand the role and contents of testing activities in different life cycle phases.

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


TOTAL: 45

TEXT BOOKS:


REFERENCES:

Aim: To get a feel of programming and developing an embedded system

Objectives:
- To write programs in micro-controller assembly language.
- To learn to interface various peripheral devices with microcontrollers.
- To understand real-time aspects of embedded systems.

1. 8051 Microcontroller based experiments- assembly language programs -2 experiments
2. 8051 Microcontroller based experiments- Control applications
3. 8051 Microcontroller based I/O interfacing - 3 experiments
4. Testing RTOS Environment and System Programming (embedded C)
   - KEIL software example programs – 3 experiments
5. Real time systems program – 2 experiments

CS 9256 WEB TECHNOLOGY LABORATORY 0 0 3 2

Aim:
To enable the students to program in Java and to create simple Web based applications.

Objectives:
To write simple programs using Java
To design and create user interfaces using Java frames and applets
To write I/O and network related programs using Java
To create simple Web pages and provide client side validation
To create dynamic web pages using server side scripting

Experiments in the following:

1. Java Fundamentals, Classes, Objects
2. Inheritance, Polymorphism
3. Interfaces, Exception handling
4. I/O, AWT
5. Socket Programming
6. Applets, Swings
7. Database connectivity
8. RMI
9. XML, Style sheet, Parser
10. Client side scripting
11. JSP, Servlets
12. Session Management

Total : 45
1. Basic UNIX commands.
2. Shell Programming.
3. Grep, sed, awk.
4. File system related system calls.
7. Pipe, FIFO’s.
8. Signals.
9. Shared memory.
10. Semaphores.

TOTAL = 45