CGPA Booster

Time Table Sem - 3

Date	Day	Shift 1 (7 - 8: 20Pm)	Shift 2 (8: 40 -10 Pm)
27/09/2021	Monday	DSA (Ch-1, part 1)	Maths (Ch-1)
28/09/2021	Tuesday	DBMS (Ch-1, part 1)	Python (Ch - 1)
29/09/2021	Wednesday	DSA (Ch-1, part 2)	DBMS (Ch-1, part 2)
30/09/2021	Thursday	Python (Ch - 2)	DSA (Ch-2, part 2)
1/10/2021	Friday	DSA (Ch-2, part 1)	Maths (Ch-2,part 1)
2/10/2021	Saturday	DBMS (Ch-2, part 1)	Maths (Ch-2,part 2)
3/10/2021		Python Extra Classes from 7 to 9 pm	
4/10/2021	Monday	DBMS (Ch-2, part 2)	Python (Ch - 3)
5/10/2021	Tuesday	DSA (Ch-3, part 2)	DBMS (Ch-3, part 1)
6/10/2021	Wednesday	DSA (Ch-3, part 2)	Maths (Ch-3,part 1)
7/10/2021	Thursday	DBMS (Ch-3, part 2)	Maths (Ch-3,part 2)

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CSE205:DATA STRUCTURES AND ALGORITHMS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

- develop skills to design and analyze linear and non linear data structures
- assess how the choice of data structures and algorithm design methods impacts the performance of programs
- strengthen the ability to identify and apply the suitable data structure for the given real world problem

Unit I

Introduction : Basic Data Structures, Basic Concepts and Notations, Complexity analysis: time space and trade off, Omega Notation, Theta Notation, Big O notation

Arrays : Linear arrays: memory representation, Traversal, Insertion, Deletion, Searching, Merging and their complexity analysis.

Sorting and Searching : Bubble sort, Insertion sort, Selection sort

Unit II

Linked Lists : Introduction, Memory representation, Allocation, Traversal, Insertion, Deletion, Header linked lists: Grounded and Circular, Two-way lists: operations on two way linked lists

Unit III

Stacks : Introduction: List and Array representations, Operations on stack (traversal, push and pop), Arithmetic expressions: polish notation, evaluation and transformation of expressions., Evaluation and transformation of expressions, Towers of Hanoi, Merge sort

Queues and Recursion : Array and list representation, operations (traversal, insertion and deletion), Priority Queues, Deques, Function Call, Recursion implementation and Complexity issues.

Unit IV

Trees : Binary trees: introduction (complete and extended binary trees), memory representation (linked, sequential), Pre-order traversal using Stack, In-order traversal using Stack, Post-order traversal using Stack, Binary Search Tree- searching, Binary Search Tree- Insertion, Binary Search Tree- deletion

Unit V

AVL trees and Heaps : AVL trees Introduction, AVL trees Insertion, AVL trees Deletion, Heaps: Insertion, Heaps: Deletion, HeapSort, Huffman algorithm

Unit VI

Graphs : Warshall's algorithm, Shortest path algorithm Floyd Warshall Algorithm(modified warshall algorithm), Graph Traversal: BFS, DFS

Hashing : Hashing Introduction, Hash Functions, Hash Table, Closed hashing (open addressing), Linear Probing, Quadratic Probing, Double Hashing, Open hashing (separate chaining)

Text Books:

1. DATA STRUCTURES by SEYMOUR LIPSCHUTZ, MCGRAW HILL EDUCATION

References:

1. DATA STRUCTURES AND ALGORITHMS by ALFRED V. AHO, JEFFREY D. ULLMAN AND JOHN E. HOPCROFT, PEARSON

MTH401:DISCRETE MATHEMATICS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

- understand various ways to prove or disapprove some logical statements.
- solve recurrence relation by using different methods.
- describe the concept of graphs and their properties.
- understand various concepts of number theory and its applications.

Unit I

Logic and Proofs : Propositional logic, propositional equivalences, quantifiers, Introduction to proof, direct proof,proof by contraposition, vacuous and trivial proof, proof strategy, proof by contradiction, proof of equivalence and counterexamples, mistakes in proof

Unit II

Recurrence relations : recurrence relation, modelling with recurrence relations, homogeneous linear recurrence relations with constant coefficients, Method of inverse operator to solve the non-homogeneous recurrence relation with constant coefficient, generating functions, solution of recurrence relation using generating functions

Unit III

Counting principles and relations : principle of Inclusion-Exclusion, Pigeonhole, generalized pigeonhole principle, relations and their properties, combining relation, composition, representing relation using matrices and graph, equivalence relations, partial and total ordering relations, lattice, sub lattice, Hasse diagram and its components

Unit IV

Graphs theory I : graph terminologies, special types of graphs(complete, cycle, regular, wheel, cube, bipartite and complete bipartite), representing graphs, adjacency and incidence matrix, graph-isomorphism, path and connectivity for undirected and digraphs, Dijkstra's algorithm for shortest path problem

Unit V

Graphs theory II : planner graphs, Euler formula, colouring of a graph and chromatic number, tree graph and its properties, rooted tree, spanning and minimum spanning tree, decision tree, infix, prefix, and postfix notation

Unit VI

Number theory and its application in cryptography : divisibility and modular arithmetic, primes, greatest common divisors and least common multiples, Euclidean algorithm, Bezout's lemma, linear congruence, inverse of (a modulo m), Chinese remainder theorem, encryption and decryption by Ceasar cipher and affine transformation, Fermat's little theorem

Text Books:

1. DISCRETE MATHEMATICS AND ITS APPLICATIONS by KENNETH H ROSEN, MCGRAW HILL EDUCATION

References:

1. HIGHER ENGINEERING MATHEMATICS by B. V. RAMANA, MC GRAW HILL

PEL131:COMMUNICATION SKILLS-II

L:1 T:2 P:1 Credits:4

Course Outcomes: Through this course students should be able to

- demonstrate effective word choice, grammar and sentence structure for accurate and effective communication.
- use appropriate vocabulary and grammar at the advanced level
- articulate clearly organized ideas in conversations and presentations leading to apposite vocabulary for the target audience.
- compose moderately complex sentences with basic transitions to connect ideas in spoken and written discourse.

Unit I

Meeting and greeting people : vocabulary and common errors related to salutation, vocabulary and common errors related to self-introduction, vocabulary and common errors related to asking for help, common errors related to tenses and parts of speech

Unit II

Usage of connectors and transition words in conversation : usage of connectors, transition words and vocabulary related to routine, usage of connectors,transition words and vocabulary related to shopping, usage of connectors,transition words and vocabulary related to vacation

Unit III

Engaging in small talk : direct and indirect speech, vocabulary and phrases related to small talk, importance of small talk

Unit IV

Presenting your ideas effectively : introducing stress and intonation, introducing dignitaries using positive adjectives, presenting ideas on products using positive adjectives

Unit V

Paragraph writing and power point presentation : introducing paragraph writing, key elements of paragraph writing, usage of collocations, do's and don'ts of power point presentation

Unit VI

Making reservation and arrangements : telephone etiquettes, vocabulary and phrases for making reservation and arrangements, formal letter writing- request and complaint letters

References:

1. ENGLISH GRAMMAR IN USE by RAYMOND MURPHY, CAMBRIDGE UNIVERSITY PRESS

CSE211:COMPUTER ORGANIZATION AND DESIGN

L:3 T:1 P:0 Credits:4

Course Outcomes: Through this course students should be able to

- review the structure and functioning of a digital computer and understand its overall system architecture.
- describe and understand the generic principles that underlie the building of a digital computer, digital logic and memory hierarchy
- analyze the working of memory unit and study the examples of mapping techniques for different cache memory systems
- understand functioning of the basic building blocks of a computer
- visualize the underlying architecture and connection of various hardware components of a computer
- develop innovative architectural designs of computers based on the common and fundamental concepts

Unit I

Basics Of Digital Electronics : Multiplexers and De multiplexers, Decoder and Encoder, Registers., Logic gates, Flip flops, binary counters, Introduction to combinational circuit, introduction to sequential circuits

Register Transfer and Micro Operations : Register Transfer Language and Register Transfer, Logic Micro Operations, Shift Micro Operations, register transfer, arithmetic microoperations

Unit II

Computer Organization : instruction codes, computer registers, common bus system, computer instructions, timing and control, instruction cycle, memory reference instructions, input-output and interrupt

Unit III

Central Processing Unit : General Register Organization, Data Transfer and Manipulation, Program control, Addressing Modes, Reduced instruction set computer, Complex instruction set computer

Unit IV

Input-Output Organization : Input Output Interface, Priority interrupt, Data transfer schemes, Direct memory access transfer, Input/Output processor., modes of data transfer

Unit V

Memory hierarchy : main memory, auxiliary memory, associative memory, cache memory, virtual memory

Unit VI

Introduction to Parallel Processing : Pipelining, Characteristics of multiprocessors, Interconnection Structures, parallel processing

Latest technology and trends in computer architecture : multi-cores processor., next generation processors architecture, microarchitecture, latest processor for smartphone or tablet and desktop

Multiprocessors : Categorization of multiprocessors(SISD,MIMD,SIMD.SPMD), Introduction to GPU

Text Books:

1. COMPUTER SYSTEM ARCHITECTURE by MORRIS MANO, PRENTICE HALL

References:

1. COMPUTER ARCHITECTURE A QUANTITATIVE APPROACH by HENNESSY,J.L,DAVID A PATTERSON, AND GOLDBERG, PEARSON

2. COMPUTER ORGANIZATION AND ARCHITECTURE-DESIGNING FOR PERFORMANCE by WILLIAM STALLINGS, PRENTICE HALL

INT213:PYTHON PROGRAMMING

L:2 T:0 P:2 Credits:3

Course Outcomes: Through this course students should be able to

- analyze real life situational problems and think creatively about solutions of them.
- apply a solution clearly and accurately in a program using python.
- analyze and visualize the data using python libraries.
- apply the concept of dynamic programming to solve the real world problems.

Unit I

Introduction : introduction to python, programming languages, programming errors
Variables, expression and statements : identifiers, variables, assignment statements, expressions, named constant, simultaneous assignment, boolean types, numeric data types, operators, operator precedence and associativity, augmented assignment operators, type conversion and rounding
Conditionals and iteration : conditional expressions, random numbers, minimizing numerical errors, if statement, two way if-else, nested if and multi-way if-elif-else statements, for loop, while loop, nested loops, break and continue
Functions and recursion : defining a function, function call, return values, positional and keyword arguments, passing arguments by reference values, scope of variables, default arguments, returning multiple values, recursion, recursion vs iteration, tail recursion, math functions

Unit II

String : string a compound data type, length, string traversal, string slices, comparison, string functions, the str class.
Lists : list basics, copying lists, passing lists to functions, returning lists from functions, searching and sorting lists, multidimensional list.
Numpy arrays: arrays vs lists, data types, array creation routines, arrays from existing data, indexing and slicing, array manipulation, broadcasting, binary operators, mathematical functions, statistical functions, sort, search and counting functions
Tuples, sets and dictionaries : introduction to tuples, operations on tuples, introduction to sets, set operations, creating dictionary, adding, modifying and retrieving values, deleting items, dictionary methods, operations on dictionary.

Unit III

Handling data with pandas : Introduction to pandas, series, dataframe, descriptive statistics, sorting, working with csv files, operations using dataframes.
Files and exceptions : introduction, text input and output, pickling, exceptions handling, raising exceptions,
Building GUI using python : tkinter programming, tkinter widgets like button, canvas, entry, frame, label, list box, menu, message, scale, text, spinbox, labelframe, tkMessagebox, standard attributes, geometry management, GUI and database with sqlite3

Unit IV

Classes and objects : creating classes, creating instance objects, accessing attributes, overview of OOP terminology
Object oriented programming terminology : Class Inheritance, Overriding Methods, Data Hiding, Function Overloading

Unit V

Data visualization with matplotlib : line plot, multiple subplots in one figure, histograms, bar charts, pie charts, scatter plots
Data visualization with seaborn : seaborn- color palette, histogram, kernel density estimates, plotting categorical data, facet grid and pair grid

Unit VI

Searching and sorting: linear search, binary search, insertion sort, selection sort, merge sort, quick sort
Dynamic programming: introduction, application of dynamic programming: factorial, Fibonacci series, longest common subsequence.

Text Books:

1. INTRODUCTION TO PROGRAMMING USING PYTHON by Y. DANIEL LIANG, PEARSON

References:

1. PYTHON PROGRAMMING: USING PROBLEM SOLVING APPROACH by REEMA THAREJA, OXFORD UNIVERSITY PRESS

CSE320:SOFTWARE ENGINEERING

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

- Plan and deliver an effective software engineering process, based on knowledge of widely used development life cycle models.
- Construct implementable design from requirement specification, following a structured and organised process.
- Translate a requirements specification into an implementable design, following a structured and organised process.
- Formulate a testing strategy for a software system, employing test case design techniques such as functional and structural testing.
- Analyze project including planning, scheduling, estimation and configuration management.

Unit I

Introduction to software engineering : Evolution and impact of software engineering, Software life cycle models, Waterfall model, Prototyping model, Evolution and spiral models, Feasibility study, Functional and non-functional requirements, Requirement gathering, Requirement analysis and specification

Unit II

Issues in software design : Basic issues in software design, Modularity, Cohesion, Coupling and layering, Function oriented software design, Data flow diagram and structure chart

Unit III

Object modelling : User interface design, unified process, Object modelling using UML, use case model development, Coding standards and code review techniques

Unit IV

Testing : Fundamentals of testing, Black box testing techniques, White box testing techniques, Levels of testing, Test cases

Introduction to selenium : Feature of selenium, Versions of selenium, Record and play back

Unit V

Software project management : Project managment, Project planning and control, Cost estimation, Project scheduling using PERT and GANTT charts, Software configuration management

Unit VI

Quality management : Quality management, ISO and SEI CMMI, PSP and six sigma, Computer aided software engineering, Software maintenance, Software reuse, Component based software development

Advance techniques of software engineering : Agile development methodology, Scrum, Aspect oriented programming, Extreme Programming, Adaptive software development, Rapid application development (RAD), Software coloning

Text Books:

1. FUNDAMENTALS OF SOFTWARE ENGINEERING by RAJIB MALL, PRENTICE HALL

References:

1. SOFTWARE ENGINEERING by IAN SOMMERVILLE, PEARSON

2. SOFTWARE ENGINEERING:A PRACTITIONER APPROACH by ROGER S.PRESSMAN, MCGRAW HILL EDUCATION

3. SOFTWARE ENGINEERING FUNDAMENTALS by ALI BEHFOROOZ AND FREDERICKS J. HUDSON, OXFORD UNIVERSITY PRESS

INT306:DATABASE MANAGEMENT SYSTEMS

L:0 T:0 P:5 Credits:3

Course Outcomes: Through this course students should be able to

- develop skills and understanding in the database design and make use of database management systems for applications
- develop understanding about relational algebra, relational model and SQL for implementing and maintaining databases
- develop understanding about the different issues involved in the design and implementation of a database system
- develop skills and understanding about the real time transaction management systems and the concurrency control techniques
- compose programming constructs such as functions, stored procedures and triggers that can be shared by multiple forms, reports and data management applications

Unit I

Introduction to Databases : purpose of database systems, components of dbms, applications of dbms, three tier dbms architecture, data independence, database schema, instance, data modeling, entity relationship model, relational model

Unit II

Relational Query Languages : relational algebra, introduction to data definition language, data manipulation, data control and transaction control language, integrity constraints, database keys, sql basic operations, aggregate functions, sql joins, set operators, views, subqueries

Unit III

Relational Database Design : data integrity rules, functional dependency, need of normalization, first normal form, second normal form, third normal form, boyce codd normal form, multivalued dependencies, fourth normal form, join dependencies, fifth normal form and pitfalls in relational database design

Unit IV

Database Transaction Processing : transaction system concepts, desirable properties of transactions, schedules, serializability of schedules, concurrency control, recoverability

Unit V

Programming Constructs in Databases : flow control statements, functions, stored procedures, cursors, triggers, exception handling

Unit VI

File Organization and Trends in Databases : file organizations and its types, indexing, types of indexing, hashing, hashing techniques, introduction to big data, nosql systems

Text Books:

1. DATABASE SYSTEM CONCEPTS by HENRY F. KORTH, ABRAHAM SILBERSCHATZ, S. SUDARSHAN, MCGRAW HILL EDUCATION

References:

1. DATABASE SYSTEMS: MODELS, LANGUAGES, DESIGN AND APPLICATION PROGRAMMING by RAMEZ ELMASRI, SHAMKANT B. NAVATHE, PEARSON

2. AN INTRODUCTION TO DATABASE SYSTEMS by C. J. DATE, S. SWAMYNATHAN, A. KANNAN, PEARSON

3. SQL, PL/SQL: THE PROGRAMMING LANGUAGE OF ORACLE by IVAN BAYROSS, BPB PUBLICATIONS

4. SIMPLIFIED APPROACH TO DBMS by PRATEEK BHATIA AND GURVINDER SINGH, KALYANI PUBLISHERS