

ANWAR UL ULOOM COLLEGE

An Autonomous Muslim Minority Institution, Affiliated to Osmania University,
New Mallepally, Hyderabad– 500001, Telangana State, India

Bachelor of Science (B.Sc.) Programme

DEPARTMENT OF COMPUTER SCIENCE



Choice Based Credit System

**Board of Studies Meeting For the
Academic year 2021-22**

ANWAR UL ULOOM COLLEGE

(An Autonomous Muslim Minority Institution, Affiliated to Osmania University)
New Mallepally, Hyderabad-1

DEPARTMENT OF COMPUTER SCIENCE

STRUCTURE OF MODEL CURRICULUM FOR B.Sc. I, II & III YEAR (CBCS)

Class	Sem	Course/Paper	Code No	T	P	IA	Exam	Total	Credits
B.Sc. First Year (Batch- 2021-22)	I	Paper - I (Theory)	6110	4		20	80	100	4
		Programming in C							
		Paper - I (C-LAB)	6110P		3				1
	II	AECC-I - ENV. STUDS.	A6110	2			50	50	2
		Paper - II (Theory)	6210	4		20	80	100	4
		Programming in C++							
B.Sc. Second Year (Batch- 2020 -21)	III	Paper -II (C++-LAB)	6210P		3		50	50	1
		AECC-II	A6210	2		50	50	2	
		Basic Computer Skills							
B.Sc. Second Year (Batch- 2020 -21)	III	Paper -III (Theory)	6310	4		15	35	50	4
		Data Structures							
		Paper -III(DS-LAB)	6310P		2		25	25	1
	IV	SECC-I - PYTHON-I	6310A1	2			50	50	2
		SECC-II	6310A2	2			50	50	2
		Software Engineering							
B.Sc. Third Year (Batch- 2019-20)	V	Paper -IV (Theory)	6410	4		15	35	50	4
		DBMS							
		Paper -IV(DBMS- LAB)	6410P		2		25	25	1
		SECC-III- PYTHON-II	A6410	2			50	50	2
B.Sc. Third Year (Batch- 2019-20)	VI	SECC-IV- Data Science	A6410	2			50	50	2
		Paper -V (Theory)	6510	4		15	35	50	4
		OPTIONALS:							
	VI	1) Programming in JAVA							1
		OR							
		2) Operating System							
VI	Paper -V-(Practical)	6510P		2		25	25	1	
	SECC-III- Soft. Engg.	S6510	2			50	50	2	
	GE-I- INFO.TECHY-I	G6510	2			50	50	2	
B.Sc. Third Year (Batch- 2019-20)	VI	Paper -VI	6610A	4		15	35	50	4
		OPTIONALS:							
		1) Web Technology							
		OR							
VI	2) Computer Networks								
	Paper -VI (Practical)	6610AP	2	2		25		1	
	SECC-IV -DATA SCI.	S6610	2			50		2	
GE-II - INFO. TECH.-II	G6610	2			50		2		

B.Sc. I year I Semester
(Computer Science Paper-I/Paper Code: 6110)
Programming in C

Max Marks: 80
Hrs/Week: 04

No. of Credits: 04
No. of Hrs: 48

Unit I: (12Hrs)

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS, Operational Overview of a CPU.

Program Fundamentals: Generation and Classification of Programming Languages, Compiling, Interpreting, Loading, Linking of a Program, Developing Program, Software Development.

Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms, Structured Programming Concept.

Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation—precedence and associativity, Type Conversions.

Unit II: (12Hrs)

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,

Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements—while, for, do-while; Special Control Statements – goto, break, continue, return and exit.

Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multi-dimensional Arrays.

Unit III: (12Hrs)

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Scope of Variables, Storage Classes, Inline Functions, and Recursion.

Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

Unit IV: (12Hrs)

User-defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Array of Structures (Union), Structures vs Unions, enumeration types.

Files: Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

Graphics under C: Introduction, Initializing graphics drivers, Graphics library and important graphics functions, `initgraph()` function, Colors in graphics mode, draw shapes such as circle, line, rectangle and ellipse using C graphics. Simple programs.

Text book:

Computer Fundamentals and Programming in C (2e) By Pradip Dey, Manas Ghosh

Reference books:

1. Ivor Horton, Beginning C
2. Herbert Schildt, The Complete Reference C
3. Paul Deitel, Harvey Deitel, C How To Program

Note: Theory Exam (80 M) + Internal Assessment (20M) = 100Marks

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B.Sc. I Year I Semester
Practical Paper/Paper Code: 6110P
C- LAB

Max Marks: 50
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs:24

1. Write a program to find the largest two (three) numbers using if and conditional operator.
2. Write a program to print the reverse of a given number.
3. Write a program to print the prime number from 2 to n where n is given by user.
4. Write a program to find the roots of a quadratic equation using switch statement.
5. Write a program to print a triangle of stars as follows (take number of lines from user):

```
*  
* * *  
* * * * *  
* * * * * * *  
* * * * * * * *
```

6. Write a program to find largest and smallest elements in a given list of numbers.
7. Write a program to find the product of two matrices.
8. Write a program to find the GCD of two numbers using iteration and recursion.
9. Write a program to illustrate use of storage classes.
10. Write a program to demonstrate the call by value and the call by reference concepts.
11. Write a program that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
12. Write a program to illustrate use of data type enum.
13. Write a program to demonstrate use of string functions string.h header file.
14. Write a program that opens a file and counts the number of characters in a file.
15. Write a program to create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
16. Write a program that opens an existing text file and copies it to a new text file with all lowercase letters changed to capital letters and all other characters unchanged.

Note:

1. Write the Pseudo Code and draw Flow Chart for the above programs.
2. Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows 10.

B.Sc. I Year I Semester
(AECC-I)(Theory Paper) / Paper Code: A6110
ENVIRONMENTAL SCIENCE

Max. Marks: 50/20
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 30

Unit I: Ecosystem, Biodiversity & Natural Resources (15Hrs)

1. Definition, scope & importance of environmental studies.
2. Structure of Ecosystem – Abiotic & Biotic components producers, consumers, decomposers, food chain, food webs Ecological pyramids.
3. Function of an Ecosystem: Energy flow in the Ecosystem (Single channel energy flow mode)
4. Definition of Biodiversity, Genetic, Species & Ecosystem diversity, Hot-spots of Biodiversity, Threats to Biodiversity, conservation of Biodiversity (Insitu&Exsitu)
5. Renewable & Non – renewable resources, Brief account of Forest, Mineral & Energy (Solar Energy & Geothermal Energy) resources.
6. Water Conservation, Rain water harvesting & Watershed management.

Unit II: Environmental Pollution, Global Issues & Legislation(15Hrs)

1. Causes, Effects & Control measures of Air Pollution, Water Pollution
 2. Solid Waste Management
 3. global Warming & Ozone layer depletion
 4. III – effects of Fire-works
 5. Disaster management – floods, earthquakes & cyclones
 6. Environmental legislation
- a) Wild life Protection Act b) Forest Act c) Water Act (d) Air Act
7. Human Rights
 8. Women and Child welfare
 9. Role of Information technology in environment and human health

Fields Study: (05 Hours)

- . Pond Ecosystem
- . Forest Ecosystem

Reference Books:

- . Environmental Studies – from crisis to cure – by R. Rajagopalan (Third edition) Oxford University Press
- . Text book of Environmental Studies for undergraduate courses (Second Edition) by ErachBharucha
- . A text book of Environmental Studies by Dr. D. K. Asthana and Dr. MeeraAsthana

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B.Sc. I year II Semester
Computer Science Paper – II/Paper Code: 6210
PROGRAMMING IN C++

Max. Marks: 80
Hrs/Week: 04

No. of Credits: 4
Total No. of Hrs: 48

Unit I: (12Hrs)

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Searching and Sorting Arrays.

Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.

Object Oriented Programming: Procedural and Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Unit II: (12Hrs)

Classes: Introduction, Defining an Instance of a Class, Why Have Private Members? Separating Class Specification from Implementation, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructor, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friend of a Class, Member-wise Assignment, Copy Constructors, Operator Overloading, Object Conversion, Aggregation.

Unit III: (12Hrs)

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructor and Destructor in Base and Derived Classes, Redefining Base Class Functions, Class Hierarchies, Polymorphism and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.

C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit IV: (12Hrs)

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception handling with Classes, Multiple Exceptions,

Extracting Data from the Exception Class, Re-throwing an Exception, Handling the bad_alloc Exception.

Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Template and Inheritance, Introduction to the STL.

Graphics Programming in C++: Introduction, Initializing graphics drivers, Graphics library and important graphics functions, initgraph() function, Colors in graphics mode, draw shapes such as circle, line, rectangle and ellipse using C++ graphics. Simple programs in graphicsmode .

Text book:

Tony Gaddis, Starting out with C++: from control structures through objects (7e)

Reference books:

1. B. Lippman, C++ Primer
2. Bruce Eckel, Thinking in C++
3. K.R. Venugopal, Mastering C++
4. Herbert Schildt, C++: The Complete Reference
5. Bjarne Stroustrup, The C++ Programming Language
6. Sourav Sahay, Object Oriented Programming with C++

Note: Theory Exam (80 M) + Internal Assessment (20M) = 100Marks

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B.Sc. I Year II Semester
Practical Paper/Paper Code: 6210P
PROGRAMMING IN C++ -LAB

Max Marks: 25
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs: 24

1. Write a program to.
 - a. Print the sum of digits of a given number.
 - b. Check whether the given number is Armstrong or not
 - c. Print the prime number from 2 to n where n is natural number given.
2. Write a program to find largest and smallest elements in a given list of numbers and sort the given list.
3. Write a menu driven program that can perform the following functions on strings.
 - a. Compare two strings for equality (== operator)
 - b. Check whether first string is smaller than the second (<= operator)
 - c. Copy the string to another.
 - d. Extract a character from the string (overload [])
 - e. Reverse the string.
- f. Concatenate two strings (+ operator)
4. Write a program using friend functions and inline functions.
5. Write a program to find area of a rectangle, circle, and square using constructors.
6. Write a program to implement copy constructor.
7. Write a program to demonstrate single inheritance and multiple inheritances.
8. Write a program to demonstrate hierarchical inheritance and multipath inheritance(using virtual functions)
9. Write a program to demonstrate static polymorphism using method overloading.
10. Write a program to demonstrate dynamic polymorphism using method overriding and dynamic method dispatch.
11. Write a program to demonstrate the function templates and class templates.
12. Write a program to menu driven program for accepting two numbers and perform calculator operations
Addition, subtraction, multiplication, division and remainder using function template.
13. Write a program to demonstrate exception handling.
14. Write a program to demonstrate various input-output manipulations.
15. Write a program to implement stack abstract data type.
16. Write a program to demonstrate array of objects.

Note: Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows 10.

MOOCs (Massive Online Open Courses) Free Resources

E-Learning:

- 1) NPTEL : nptel.ac.in [Core Subjects Certification]
- 2) C++ INSTITUTE : cppinstitute.org [C++ Certification]
- 3) ORACLEEDUCATION : education.oracle.com [Java, DBMS Certification]
- 4) BIG DATA UNIVERSITY : bigdatauniversity.com [Big Data Certification]
- 5) COURSERA : coursera.org [Core Subjects Certification]
- 6) CODEACADEMY : codecademy.com [Coding Certification]
- 7) KHANACADEMY : khanacademy.org [Core Subjects Certification]
- 8) PIXAR IN A BOX : khanacademy.org/partner-content/pixar
- 9) VIDEOLECTURES : videlectures.net
- 10) YOUTUBEEDU : plus.google.com/+YouTubeEDU/posts
- 11) DISNEY RESEARCH : disneyresearch.com
- 12) ALISON : alison.com [Core Subjects Certification]
- 13) INTERNET ARCHIVE : archive.org
- 14) C++PROGRAMMING : cprogramming.com [Learning C and C++]

Freeware:

- 1) SCILAB : scilab.org [MatLab Equivalent]
- 2) GEOGEBRA : geogebra.org [Software for Class Room Teaching]

Search Engine:

- 1) WOLFRAM ALPHA : wolframalpha.com [Computing Engine]
- 2) CITESEER : citeseerx.ist.psu.edu [Searching Research Articles]
- 3) DOAJ : doaj.org [Open Access to Journals]

B.Sc. I Year II Semester
AECC-II – (Theory Paper)/Paper Code: A6210
BASIC COMPUTER SKILLS

Max. Marks: 50
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 30

Objective: to impart a basic level understanding of working of a computer and its usage.

UNIT I:

UNDERSTANDING OF COMPUTER AND WORD PROCESSING:

Knowing computer: What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

Operating Computer using GUI Based Operating System:

What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts, Basics of O.S Setup; Common utilities.

Understanding Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

UNIT II:

SPREAD SHEET, PRESENTATION SOFTWARE & INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS:

Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.

Basics of presentation software: Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.

Introduction to Internet, WWW and Web Browsers:

Introduction to Internet: Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubleshooting.

World Wide Web: Search Engines; Understanding URL; Domain name; IP Address; Using e-governance website. Web Browsing: Software, Communications and collaboration: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration; Instant Messaging; Netiquettes.

SUGGESTED READINGS:

1. Introduction to Computers, Peter Norton, Mc GrawHill , 2012.
2. Using Information Technology, Brian K williams, StaceyC.Sawyer, Tata Mc GrawHill.

Web Resources:

1. <https://online.stanford.edu/courses/soe-yccscs101-sp-computer-science-101>
2. <https://www.extension.harvard.edu/open-learning-initiative/intensive-introduction-computer-science..>

ANWARUL ULOOM COLLEGE (AUTONOMOUS)

An Autonomous Muslim Minority Institution, Affiliated to Osmania University, Hyderabad.

New Malleshpally, Hyderabad-1

QUESTION PAPER PATTERN

FOR FIRST AND SECOND SEMESTERS

Class & Sem.	I year I Sem.
Subject	Programming in C
Annual/BL	Regular
Time	3 Hours
Max/Min	Marks 80/28

Date	12-03-2021
Time	8:00 to 11:00AM
Code No.	6110
Course	MECS
Roll No.	1062-21-474-401

Section- A **Short Answers**

I Answer any four (5) of the following

5 X 4 = 20 Marks

Unit-1

Unit-2

Unit-3

Unit-4

Choose from any of the above unit

Section- B **Long Answers**

II Answer all the questions in 150 words

4 X 15 = 60 Marks

1. Unit-1

Or

Unit-1

2. Unit-2

Or

Unit-2

3. Unit-3

Or

Unit-3

4. Unit-4

Or

Unit-4

B.Sc. II year III Semester
Computer Science Paper-IV/ Paper Code: 6310
DATA STRUCTURES

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
No. of Hrs: 48

Unit I: (12Hrs)

Data Structure: Data & Data items, Data types, Concept of Data Structure, Classification of Data Structures, Operations on data structures, Array, Types of Arrays, Multidimensional arrays, Representation of Array in Computer memory, Operations on arrays, array sorting, array searching, dynamic array, variable length array

Unit II: (12Hrs)

Linked Lists: Linked list concepts, Advantages, Types of linked lists, Comparison between Array & Linked list, Creating Simple Linked list, Performing Operations (Traversing, Inserting, Deleting) on linked list, Creating Doubly linked list, Advantages, Operations on double linked list, Creating Circular linked list, Operations on a Circular linked list

Unit III: (12Hrs)

Stacks and Queues: Representation of stacks, Conversion of Arithmetic expressions, Use of Stack in evaluating arithmetic expression, Representation of Queue, Linked list implementation of Queue, Application of Queue, Representation of Circular Queues, D-Queues, Priority queue.

Sorting: Bubble, Selection and Insertion sort, quick sort, tree sort.

Searching: Linear search & Binary search.

Unit IV: (12Hrs)

Binary Trees: Tree Terminology, Binary Tree, Complete Binary Tree, Binary Tree Traversal Techniques(Preorder, Inorder, Postorder), Array based Representation of Binary Trees, Linked based representation of Binary tree, Complete Binary Tree.

Graphs: Introduction, Representation of graphs, traversing a Graph, Breadth First Search & Traversal, Depth First Search & Traversal.

Introduction to Modern Data Structures: Introduction, Concept, List data structure, representation of list, Concept of Tuple data structure and its representation in memory, Concept of Dictionary, Advantages of Dictionary data structure.

Prescribed books:

Data Structures by Schaum's outline Series by TMH

Robert Lafore, Data Structures & Algorithms in Java, Second Edition, Pearson Education(2008)

Reference Books:

Adam Drozdek, Data Structures and Algorithms in Java, Second Edition, CengageLearning(2008).

John R. Hubbard, Anita Hurry, Data Structures with Java, Pearson Education (2008).

Samatha, Classic Data Structures, PHI (2005).

B.Sc. II Year III Semester
Practical Paper/Paper Code: 6310P
DATA STRUCTURES LAB

Max Marks:25
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs: 24

Data Structures Lab

1. Program to implement Bubble Sort Method.
2. Write a program to search an element using binary search method.
3. Program to implement Selection Sort.
4. Program to Sort a list using insertion sort method.
5. Program to create, insert, delete and display operations on single linked list.
6. Program to create, insert, delete and display operations on double linked list.
7. Program to create, insert, delete and display operations on circular linked list.
8. Program to implement PUSH and POP operations on Stack using array method.
9. Program to implement insert and delete operations on Queue.
10. Program to implement, insert and delete operations on Priority Queue.
11. Program to implement, insert and delete operations on Double Ended Queue.
12. Program to evaluate postfix expression by using Stack.
13. Program to construct Binary Search Tree and implement tree traversing Techniques.
14. Program to implement Operations on Circular Queue.
15. Program to implement a Graph.

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B.Sc. II Year III Semester
SECC-I / Paper-Code: 6310A
PYTHON-I

Max & Min Marks: 50/20
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

UNIT-I: (12Hrs)

Introduction to Python: Python, Features of Python, Execution of a Python Program, Viewing the Byte Code, Flavors of Python, Python Virtual Machine, Comparisons between C and Python, Comparisons between Java and Python.

Writing Our First Python Program: Installing Python for Windows, Setting the Path to Python, Writing Our First Python Program, Executing a Python Program,

UNIT-II: (12Hrs)

Data types in Python: Comments in Python, Doc strings, How Python Sees Variables, Data types in Python, Built-in data types, bool Data type, Sequences in Python, Sets, Literals in Python, Determining the Data type of a Variable, What about Characters, User-defined Data types, Constants in Python, Identifiers and Reserved words, Naming Conventions in Python.

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

Text Book: R. Nageswara Rao, Core Python Programming, Dreamtech Press

References:

Mark Lutz, Learning Python

Tony Gaddis, Starting Out With Python

Kenneth A. Lambert, Fundamentals of Python

James Payne, Beginning Python using Python 2.6 and Python 3

Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3

Note:

Student friendly video lecturers pertaining to this course are available at <http://spoken-tutorial.org/>

Teachers are advised to teach this courses in the computer lab itself, so that the interested

Students may derive some time to perform few programs their own.

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B.Sc. II Year III Semester
SECC-II / Paper-Code: 6310B
SOFTWARE ENGINEERING

Max. Marks: 50
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

Unit-I: (6Hrs)

Introduction to Software Engineering: Software Engineering, Comparison between Software Engineering and Traditional Programming, Emergence of Software Engineering,

Software Life Cycle Model: Software Life Cycle Model, Waterfall Model, Iterative Waterfall Model and Prototype Model.

Unit-II: (6Hrs)

Planning a Software Project: Team Structure (i.e., Democratic Teams, Chief Programmer Team, Mixed Control Team Organization or Hierarchical Team Structure), Characteristics of a Software Requirement Specification (SRS), Components of the Software Requirement, Structure Information, Data Flow Diagram (DFDs), Data Dictionary.

Unit-III: (6Hrs)

Software Design: Design Objectives and Principles, Software Design Concepts, (Abstraction, Information Hiding, Concurrency), Cohesion and Coupling.

Unit-IV: (6Hrs)

Testing Strategies and Metrics: Software Testing, Software Testing Fundamentals, Design of Test Case (Black-Box Approach, White-Box Approach), Version Control, Change Control.

Text book:

1. Software Engineering – By Roger S. Pressman, Tata McGraw Hill

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

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B.Sc. III year IV Semester (Computer Science)
Paper-IV (Theory) / Paper Code: 6410
DATABASE MANAGEMENT SYSTEM (DBMS)

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
No. of Hrs: 48

Unit-I: (12)

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

Relational Model: Introduction, Terminology, Integrity Constraints, Views. The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

Unit-II: (12)

SQL: Introduction, Data Manipulation–Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, SQL Data Types, Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition–Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index.

Views: Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization.

Transactions, Discretionary Access Control–Granting Privileges to Other Users, Revoking Privileges from Users.

Unit-III: (12)

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

Entity–Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Problems with ER Models.

Enhanced Entity–Relationship Modeling: Specialization/Generalization, **Aggregation, Composition, Functional–Dependencies:** Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency.

Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, 1NF, 2NF, 3NF, BCNF. The Database

Unit-IV: (12)

Database Design: The Information System, The Systems Development Life Cycle, The Database Life Cycle, Database Design Strategies, Centralized Vs Decentralized design.

Transaction Management: Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control, Serializability, Locking Methods, Deadlock, Time Stamping Methods, Database Recovery.

Security: Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

Distributed Database System: Concept, Types of Distributed Database, Homogeneous Database, Heterogeneous Database, Distributed Data Storage, Replication, Fragmentation, Client and Server, Applications of Distributed database

Text Book:

Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

References:

Sharon Allen, Evan Terry, Beginning Relational Data Modeling
Jeffrey A. Hoffer, V. Ramesh, HeikkiTopi, Modern Database Management
Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems
RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems
Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts.

B.Sc. III Year IV Semester
Practical Paper IV/Paper Code: 6410P
DBMS LAB

Max Marks:25
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs: 24

Consider the relational schema for part of the DreamHome case study is:

Branch (branchNo, street, city, postcode)

Staff (staffNo, fName, IName, position, sex, DOB, salary, branchNo)

PropertyForRent (propertyNo, street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)

Client (clientNo, fName, IName, telNo, prefType, maxRent, eMail)

PrivateOwner (ownerNo, fName, IName, address, telNo, eMail, password)

Viewing (clientNo, propertyNo, viewDate, comment)

Registration (clientNo, branchNo, staffNo, dateJoined)

1. Create a database with name “DreamHome” and now create all the tables listed above with constraints.
2. Insert a new row into the table supplying data for all columns.
3. Modify data in the database using UPDATE
4. Delete data from the database using DELETE
5. Changing a table definition using ALTER
6. Removing a table using DROP
7. Removing rows in table using TRUNCATE
8. Create an index and removing an index
9. List all cities where there is either a branch office or a property for rent.
10. List all managers and supervisors.

Consider the relational schema for part of the Hotel case study:

Hotel (hotelNo, hotelName, city)

Room (roomNo, hotelNo, type, price)

Booking (hotelNo, guestNo, dateFrom, dateTo, roomNo)

Guest (guestNo, guestName, guestAddress)

1. Create a database with name “Hotel” and now create all the tables listed above with constraints.
2. Insert a new row into the table supplying data for all columns.
3. Modify data in the database using UPDATE
4. Delete data from the database using DELETE
5. Changing a table definition using ALTER
6. Removing a table using DROP
7. Removing rows in table using TRUNCATE

8. List full details of all hotels.
9. List full details of all hotels in London.
10. List the names and addresses of all guests living in London, alphabetically ordered by name.

Given relation schemas are Sailors

Sailors(sid : integer, sname : string, rating : integer, age : real)

Boats(bid : integer, bname : string, color : string)

Reserves(sid : integer , bid : integer, day : date)

1. Find the names and ages of all sailors.
2. Find all sailors with a rating above 7.
3. Find the names of sailors who have reserved boat 103.
- 4 Find the sids of sailors who have reserved a red boat.
5. Find the names of sailors who have reserved a red boat.
6. Find the colors of boats reserved by Lubber.
7. Find the names of sailors who have reserved at least one boat.
8. Find the names of sailors who have reserved at least two boats.
9. Compute increments for the ratings of persons who have sailed two different boats on the same day.
10. Find the ages of sailors whose name begins and ends with B and has at least three characters.

Pl/Sql Programs:

1. Write A Pl/Sql Program To Check The Given Number Is Prime Or Not.
2. Write A Pl/Sql Program To Check The Given String Is Palindrome OrNot.
3. Write A Pl/Sql Program To Generate Multiplication Tables For 2,4,6
4. Write A Pl/Sql Program to display sum of EVEN/ODD numbers in the given range.
5. Demonstrate exceptions in PL/SQL
6. Demonstrate cursors in PL/SQL
7. Write PL/SQL queries to create procedures.
8. Write PL/SQL queries to create functions.
9. Write PL/SQL queries to create package.
10. Write PL/SQL queries to create triggers.

Note:

- 1) Recommended to use open source database software like MySQL, MongoDB, PostgreSQL, etc...

B.Sc. II Year IV Semester
SECC-III / Paper-Code: 6410A
PYTHON-II

Max & Min Marks: 50/20
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

UNIT-I: (12Hrs)

Operators in Python: Arithmetic Operators, Assignment Operators, Unary Minus Operator, Relational Operators, Logical Operators, Boolean Operators, Bitwise Operators, Membership Operators, Identity Operators, Operator Precedence and Associativity, Mathematical Functions.

Input and Output: Output statements, Input Statements, Command Line Arguments.

UNIT-II: (12Hrs)

Control Statements: Control Statements, The if Statement, A Word on Indentation, The if ... else Statement, The if ... elif ... else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops, The else Suite, The break Statement, The continue Statement, The pass Statement, The assert Statement, The return Statement.

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

Text Book: R. Nageswara Rao, Core Python Programming, Dreamtech Press

References:

Mark Lutz, Learning Python

Tony Gaddis, Starting Out With Python

Kenneth A. Lambert, Fundamentals of Python

James Payne, Beginning Python using Python 2.6 and Python 3

Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3

Note:

Student friendly video lecturers pertaining to this course are available at <http://spoken-tutorial.org/>

Teachers are advised to teach this courses in the computer lab itself, so that the interested

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B.Sc. III Year VI Semester
SECC-IV / Paper Code: 6410B
DATA SCIENCE

Max & Min Marks: 50/20
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

UNIT-I: (12Hrs)

Introduction: A brief History of Data Science, Definition, Features of Data Science, Characteristics and applications of data science, Data Scientist, Components of Data Science. Advantages and Disadvantages of **Data Science Languages and their features:** Introduction and Features of Python, R-Programming, SCALA, Java, SQL, MATLAB, KERAS and Tensor. Data Mining

UNIT-II: (12Hrs)

Data Science: Need for Data Science, Types of Data Science Jobs, Objectives of Data Scientist, Responsibilities of Data Scientist, Business Intelligence. Difference between Data Science and Business Intelligence. Data Science Life Cycle. Machine Learning in Data Science. Data Science algorithms. Artificial Intelligence, Deep Learning. Basics of Python Programming. Sample Python Programs.

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

Text Book: Fundamentals of Data Science By: Samuel Burns

References:

Python Data Science Handbook By: Jake Vander (O'reilly)
Data Science By: John D. Kelleher, Brendan Tierney
Kenneth A. Lambert, Fundamentals of Python

B.Sc. III year V Semester
Computer Science Paper-V/Paper Code: 6510
OPTIONAL - A
PROGRAMMING IN JAVA

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
No. of Hrs: 48

Unit I: (12 Hrs)

Fundamentals of Object Oriented Programming: Object oriented Paradigm-Basic concepts of Object Oriented Programming-Benefits of OOP-Applications of OOP. Java Features-How Java differs from C and C++-Java and Internet-Java and World Wide Web –Web Browsers-Hardware and Software Requirements-Java Environment

Overview of Java Language: Simple Java Program-Java Program Structure-Java Tokens-Java Statements-Implementing a Java Program-Java Virtual Machine-Command Line Arguments

Unit II: (12 Hrs)

Constants and Variables: Constants,-Variables-Data Types-Declaration Of Variables-Giving Values To Variables-Symbolic Constants-Type Casting.

Operators and expressions: Arithmetic operators –Relational operators-Logical operators-Assignment operators-increment and decrement operators-conditional operators

Decision Making and Branching: Decision Making with if statement-simple if statement-if-else-statement-Nesting if else Statement-the Elseif Ladder-The switch Statement-The ?: operator.

Looping: The while statement- The do statement- The for Statement-Jumps in Loops.

Unit III: (12 Hrs)

Classes, Objects and Methods: Defining a class- fields Declaration-Methods Declaration-Creating Objects-Accessing class members-Constructors-Methods overloading-Static Members-Nesting Of Methods – Inheritance-Overriding Methods-Final Variables and Methods-Final Classes-Abstract Methods and Classes-Visibility Control.

Arrays, Strings and Vectors: One dimensional Array-creating an array-Two dimensional Array – Strings, Vectors, Wrappers classes, Enumerated Type.

Unit IV: (12 Hrs)

Interfaces: Multiple Inheritance : Defining Interfaces – Extending Interfaces – Implementing Interfaces.

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages.

Multithreaded Programming: Creating Threads – Extending the Thread Class
– Stopping and Blocking a Thread – Life Cycle of a Thread

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception

Handling Code – Multiple Catch Statements – Using Finally Statement

Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet

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Prescribed books:

E.Balaguruswamy, Programming with Java, A primer, 3e, TATA McGraw-Hill Company (2008).(Chapters : 1 to 14)

Reference Books:

John R. Hubbard, Programming with Java, Third Edition, Schaum's outline Series, Tata McGrawhill (2013).

Dr. D. Samanta – Object Oriented Programming with Java, PHI.

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B.Sc. III Year V Semester
Practical Paper/ Paper Code: 6510P
OPTIONAL – A - LAB
OOP THROUGH JAVA LAB

Max Marks : 25
Hrs/Week: 02

No. of Credits : 1
Total No. of Hrs: 24

Java - Lab

1. Write a java program to determine the sum of the following harmonic series for a given value of 'n'. The series being $1+1/2+1/3+. . .+1/n$
2. Write a program to perform the following operations on strings.
 - a) Find length of given string.
 - b) Check whether one string is sub string of another string or not.
 - c) Convert the strings to uppercase.
3. Write a program to identify a duplicate value in a vector.
4. Create two threads such that one of the thread print even no's and another prints odd no's up to a given range.
5. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operations.
6. Illustrate the method overriding in JAVA.
7. WAP to Create an array of integers and sort it in ascending/descending order.
8. WAP to demonstrate type casting.
9. WAP to test the prime number.
10. WAP to handle the exception using try and multiple catch block.
11. WAP to create the package to access members of a class.
12. WAP to demonstrate single and multi level inheritance.
13. WAP to add and subtract matrices.
14. Write an applet program to insert the text at the specified position.
15. WAP to create an applet and display it in a web page.

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B.Sc. III year V Semester
Paper-V (Theory) / Paper Code: 6510
OPTIONAL - B
OPERATING SYSTEM

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
No. of Hrs: 48

UNIT- I

Introduction: Computer-System Architecture, Computing Environments. **Operating-System Structures:** Operating-System Services, User Interface for Operating-System, System Calls, Types of System Calls, Operating System Structure. Multitasking, Multiprogramming, Timesharing.

Process Management: Process Concept, Process Scheduling, Operations on Processes, Inter Process Communication, Examples–Producer-Consumer Problem.

UNIT-II

Process Synchronization: Critical-Section Problem, Peterson's Solution, Synchronization, Semaphores, Monitors.

CPU Scheduling: Concepts, Scheduling Criteria, Scheduling Algorithms.

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT-III

Main Memory: Introduction, Swapping, Contiguous Memory Allocation, Segmentation, Paging.

Virtual Memory: Introduction, Demand Paging, Page Replacement, Allocation of Frames, Thrashing.

UNIT – IV

Mass-Storage Structure: Overview, Disk Scheduling, RAID Structure.

File Systems: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, Protection. File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

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Text Book: Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts (9e)

References:

- 1) Naresh Chauhan, Principles of Operating Systems
- 2) Thomas W. Doeppner, Operating Systems in Depth
- 3) Andrew S. Tanenbaum, Modern Operating Systems
- 4) William Stallings, Operating Systems – Internals and Design Principles
- 5) Dhananjay M. Dhandhere, Operating Systems – A Concept Based Approach

B.Sc. (Computer Science): III Year V SEMESTER
Paper VB (Practical)/Paper Code: 6510P
OPTIONAL - B -LAB
OPERATING SYSTEM LAB

Max Marks: 25
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs: 24

1.
 - a) Use vi editor to create different files, writing data into files, modifying data in files.
 - b) Use different types of Unix commands on the files created in first program.
- 2 Write shell programs using 'case', 'then' and 'if' & 'else' statements.
- 3 Write shell programs using while, do-while and for loop statements.
4.
 - a) Write a shell script that accepts two integers as its arguments and computes the value of first number raised to the power of the second number.
 - b) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
5.
 - a) Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers..
 - b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
6.
 - a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
 - b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
7. Write a program that simulate the following Unix commands like ls, mv, cp.
8. Write a program to convert upper case to lower case letters of a given ASCII file.
9. Write a program to program to search the given pattern in a file.
10. Write a program to demonstrate FCFS process schedules on the given data.
11. Write a program to demonstrate SJF process schedules on the given data.
12. Write a program to demonstrate Priority Scheduling on the given burst time and arrival times.
13. Write a program to demonstrate Round Robin Scheduling on the given burst time and arrival times.
14. Write a program to implementing Producer and Consumer problem using Semaphores.
15. Write a program to simulate FIFO, LRU, LFU Page replacement algorithms.
16. Write a program to simulate Sequential, Indexed, and Linked file allocation strategies.

Note:

Recommended to use Open Source Software like Fedora, Ubuntu, CentOS, etc...

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B.Sc. III Year V Semester
SECC-III / Paper-Code: A6512
SOFTWARE ENGINEERING

Max. Marks: 50
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

Unit-I: (6Hrs)

Introduction to Software Engineering: Software Engineering, Comparison between Software Engineering and Traditional Programming, Emergence of Software Engineering,

Software Life Cycle Model: Software Life Cycle Model, Waterfall Model, Iterative Waterfall Model and Prototype Model.

Unit-II: (6Hrs)

Planning a Software Project: Team Structure (i.e., Democratic Teams, Chief Programmer Team, Mixed Control Team Organization or Hierarchical Team Structure), Characteristics of a Software Requirement Specification (SRS), Components of the Software Requirement, Structure Information, Data Flow Diagram (DFDs), Data Dictionary.

Unit-III: (6Hrs)

Software Design: Design Objectives and Principles, Software Design Concepts, (Abstraction, Information Hiding, Concurrency), Cohesion and Coupling.

Unit-IV: (6Hrs)

Testing Strategies and Metrics: Software Testing, Software Testing Fundamentals, Design of Test Case (Black-Box Approach, White-Box Approach), Version Control, Change Control.

Text book:

2. Software Engineering – By Roger S. Pressman, Tata McGraw Hill

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

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B.Sc. III Year V Semester
(GENERIC ELECTIVE - I) / Paper-Code: G6513
INFORMATIN TECHNOLOGY - I

Max. Marks: 50
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

Unit-I: (12Hrs)

Introduction to Computers: What is a Computer? Characteristics of Computers, Generations of Computers, Classification of Computers, Basic Computer Organization, Applications of Computers.

Input and Output Devices: Input Devices, Output Devices, Soft Copy Devices, Hard Copy Devices.

Computer Memory and Processors: introduction, Memory Hierarchy, Processor Registers, Cache Memory, Primary Memory, Secondary Storage Devices, Hard Disks, Optical Drives, USB Flash Drives, Memory Cards.

Unit-II: (12Hrs)

Computer Software: Introduction, Classification of Computer Software, System Software, Applications Software, Firmware, Middleware, Acquiring Computer Software.

Operating Systems: Introduction, Evolution of OS, Process Management, Memory Management, File Management, Device Management, Security Management, Command Interpreter, Windows, Linux.

Text Book Reema Thareja, Fundamentals of Computers

References

P. K. sinha, Computer Fundamentals

Anita Goel, Computer Fundamentals

V. Rajaraman, Fundamentals of Computers

E. Balagurusamy, Fundamentals of Computers

J. Glenn Brookshear, Dennis Brylow, Computer Science An Overview

Note: Student friendly video lecturers pertaining to this course are available at [http:// spoken-tutorial.org/](http://spoken-tutorial.org/)

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

B.Sc. (Computer Science) III Year, VI SEMESTER
Paper-VI (Theory) / Paper Code: 6610
OPTIONAL - A
WEB TECHNOLOGIES

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
Total no. of Hrs: 48

UNIT-I: (12Hrs)

Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Heading styles, Editing Text, Core Elements and Attributes, Attribute Groups.

Links and Navigation: Basic Links, Creating Links with the <a> Element, Advanced E- mail Links.

Images, Audio, and Video: Adding Images Using the Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages.

List and Tables: Creating list, Types of List Hyperlinking list elements, Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables, adding images, hyperlinking table elements.

UNIT-II: (12Hrs)

Frames: Introducing Frameset, <frame> Element, Creating Links Between Frames, Setting a Default Target

Frame Using <base> Element, Nested Framesets, Inline or Floating Frames with <iframe>.

Forms: Introducing Forms, Form Controls, Sending Form Data to the Server

Cascading Style Sheets: Introducing CSS, Where you can Add CSS Rules. CSS Properties: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model. More Cascading Style Sheets: Links, Lists, Tables, Outlines, The :focus and :activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules,

Positioning and Layout with CSS Page Layout: Understating the Site's Audience, Page Size, Designing Pages, Coding your Design,

UNIT-III: (12Hrs)

Developing for Mobile Devices: Design Issues: Typography, Navigation, Tables, Forms.

Learning JavaScript: How to Add Script to Your Pages, the Document Object Model, Variables, Operators, Functions, Control Statements, Looping, Events, Built- In Objects,

Working with JavaScript: Practical Tips for Writing Scripts, Form Validation, Form Enhancements, JavaScript Libraries.

Putting Your site on the web: Meta tags, Testing your site, Talking the Leap to Live, Telling the World about your site, Understanding your visitors.

UNIT-IV: (12Hrs)

Introducing PHP: What is PHP? Why use PHP? Evolution of PHP, Installing PHP, Other ways to run PHP, Creating your first script. PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants. Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML.

Protocols: Introduction, TCP/IP, HTTP, S-HTTP, SMTP, Wireless Protocols, IMAP.

Latest Web Development Trends :

AI or Bots, JavaScript, Progressive Web App, Single Page Application, Mobile-Friendly Website , Motion UI, Block chain technology, Cyber Security, Web Development Frameworks.

Text Book:

Jon Duckett, Beginning HTML, XHTML, CSS and JavaScript

References:

3. Chris Bates, Web Programming
4. M. Srinivasan, Web Technology: Theory and Practice
5. Achyut S. Godbole, AtulKahate, Web Technologies
6. Kogent Learning Solutions Inc, Web Technologies Black Book
7. Ralph Moseley and M. T. Savaliya, Developing Web Applications
8. P.J. Deitel& H.M. Deitel, Internet and World Wide Web How to program

**B.Sc. (Computer Science): III Year VI SEMESTER
Practical Paper –VI-A/Paper Code: 6610P**

**OPTIONAL – A - LAB
WEB TECHNOLOGIES LAB**

Max Marks: 25
Hrs/Week: 02

No. of Credits: 1
Total No. of Hrs: 24

1.
 - a. Write a HTML program using basic text formatting tags, <hn>, <p>,
, <pre>.
 - b. Write a HTML page for Example Cafe using above text formatting tags.
2.
 - a. Write a HTML program using presentational element tags , <i>, <strike>, <sup>, <sub>, <big>, <small>, <hr>
 - b. Write a HTML program using phrase element tags <blockquote>, <cite>, <abbr>, <acronym>, <kbd>, <address>
3.
 - a. Write a HTML program using different list types.
 - b. Write a HTML page that displays ingredients and instructions to prepare a recipe.
4.
 - a. Write a HTML program using grouping elements <div> and .
 - b. Write a HTML Menu page for Example cafe site.
5.
 - a. Write a HTML program using images, audios, videos.
 - b. Write a HTML program to create your time table.
6. Write a HTML program to create a form using text inputs, password inputs, multiple line text input, buttons, check boxes, radio buttons, select boxes, file select boxes.
7. Write a HTML program to create a frames and links between frames.
8. Write a HTML program to create different types of style sheets.
9. Write a HTML program to create CSS on links, lists, tables and generated content.
10. Write a HTML program to create your college web site using multi column layouts.
11. Write a HTML program to create your college web site using for mobile device.
12. Write a HTML program to create login form and verify username and password using DOM
- 13.13.
 - a. Write a JavaScript program to calculate area of rectangle using function.
 - b. Write a JavaScript program to wish good morning, good afternoon, good evening depending on the current time.
- 14.14.
 - a. Write a JavaScript program using switch case?.
 - b. Write a JavaScript program to print multiplication table of given number using loop.
15.
 - a. Write a JavaScript programs using any 5 events.
 - b. Write a JavaScript program using JavaScript built in objects.
16. Write a JavaScript program to create registration form and validate all fields using form validation.

**B.Sc. (Computer Science) III Year, VI SEMESTER
Paper-VI (Theory) / Paper Code: 6610**

OPTIONAL - B

COMPUTER NETWORK

Max Marks: 35
Hrs/Week: 04

No. of Credits: 04
Total no. of Hrs: 48

UNIT-I: (12Hrs)

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model–Layered Architecture, Functions of Layers, TCP/IP Reference Model.

Transmission Media: Guided Media–Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media–Satellite Communication, and Cellular Telephony.

UNIT-II: (12Hrs)

Multiplexing: Frequency–Division Multiplexing, Time–Division Multiplexing.

Data Link Layer: Error Detection–VRC, LRC, CRC, Checksum, Error Correction–Hamming Code, Burst Error Correction, Line Discipline–ENQ/ACK, Poll/Select, Flow Control–Stop-and-Wait, Sliding Window, Error Control–Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.

UNIT-III: (12Hrs)

Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation. **Switching:** Circuit Switching, Packet Switching, Message Switching.

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Routing, Distance Vector Routing Algorithm, Link State Routing Algorithm, Congestion Control.

UNIT-IV: (12Hrs)

Medium Access Sub Layer: ALOHA, MAC addresses, Carrier Sense Multiple Access, IEEE, 802.x Standard Ethernet, Wireless LANS, Bridges.

Internet Working: The Network Layer in the Internet and in ATM Networks.

Transport Layer: Duties of Transport Layer, Connection. Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text Book: Behrouz A. Forouzan, Data Communication and Networking (2e Update)

References:

- 1) S.S. Shinde, Computer Networks
- 2) William Stallings, Data and Computer Communications
- 3) Andrew S. Tanenbaum, David J Wetherall, Computer Networks
- 4) Behrouz A Forouzan, Firouz Mosharraf, Computer Networks A Top-Down Approach
- 5) James F. Kurose, Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet

Note: Theory Exam (35 M) + Internal Assessment (15M) = 50Marks

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B.Sc. (Computer Science) III Year, VI SEMESTER
Paper Code: 6610P
OPTIONAL – B - LAB

COMPUTER NETWORK LAB

Max Marks: 25
Hrs/Week: 02

No. of Credits: 01
Total no. of Hrs: 24

1. Write a program to create a socket and implement connect function.
2. Write a program to get MAC address.
3. Write a program to display hello world using signals.
4. Write a program for socket pair system call using IPC.
5. Write a program to implement the sliding window protocol.
6. Write a program to identify the category of IP address for a given IP address.
7. Write a program to print details of DNS host.
8. Write a program to implement listener and talker.
9. Write a program to implement TCP echo using client–server program.
10. Write a program to implement UDP echo using client–server program.
11. Write a UDP client–server program to convert lowercase letters to uppercase letters.
12. Write a TCP client–server program to convert a given string into reverse.
13. Write a UDP client–server program to convert a given string into reverse.
14. Write a program to implement TCP iterative client–server program.
15. Write a program to implement time service using TCP client–server program.
16. Write a program to implement time service using UDP client–server program.

Note:

Write above program using C language on Unix/Linux systems.

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B.Sc. III Year VI Semester
SECC-IV / Paper Code: A6610
DATA SCIENCE

Max & Min Marks: 50/20
Hrs/Week: 02

No. of Credits: 2
No. of Hours: 24

UNIT-I: (12Hrs)

Introduction: A brief History of Data Science, Definition, Features of Data Science, Characteristics and applications of data science, Data Scientist, Components of Data Science. Advantages and Disadvantages of **Data Science Languages and their features:** Introduction and Features of Python, R-Programming, SCALA, Java, SQL, MATLAB, KERAS and Tensor. Data Mining

UNIT-II: (12Hrs)

Data Science: Need for Data Science, Types of Data Science Jobs, Objectives of Data Scientist, Responsibilities of Data Scientist, Business Intelligence. Difference between Data Science and Business Intelligence. Data Science Life Cycle. Machine Learning in Data Science. Data Science algorithms. Artificial Intelligence, Deep Learning. Basics of Python Programming. Sample Python Programs.

Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

Text Book: Fundamentals of Data Science By: Samuel Burns

References:

Python Data Science Handbook By: Jake Vander (O'reilly)
Data Science By: John D. Kelleher, Brendan Tierney
Kenneth A. Lambert, Fundamentals of Python

B.Sc. III Year V Semester
(GENERIC ELECTIVE - II) / Paper-Code: G6610
INFORMATIN TECHNOLOGY - II

Max. Marks: 50

No. of Credits: 2

Hrs/Week: 02

No. of Hours: 24

Unit-I: (12Hrs)

Introduction to Algorithms and Programming Languages: Algorithm, Control Structures, Flowcharts, Pseudo code, Programming Languages, Generations of Programming Languages.

Database Systems: File Oriented Approach, Database Oriented Approach, Database Views, Three-Schema Architecture, Database Models, Components of DBMS, Introduction of SQL Queries.

Unit-II: (12Hrs)

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model.

The Internet: Internet Services, Types of Internet Connections, Internet Security.

Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, Onodemand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

Text Reema Thareja, Fundamentals of Computers

References

P. K. sinha, Computer Fundamentals

Anita Goel, Computer Fundamentals

V. Rajaraman, Fundamentals of Computers

E. Balagurusamy, Fundamentals of Computers

J. Glenn Brookshear, Dennis Brylow, Computer Science An Overview

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Note: Theory Exam (Max Marks: 50 Minimum Marks: 20)

ANWARUL ULOOM COLLEGE (AUTONOMOUS)

An Autonomous Muslim Minority Institution, Affiliated to Osmania University, Hyderabad.

New Mallepally, Hyderabad-1

QUESTION PAPER PATTERN FOR B.Sc. (Computer Science) III, IV, V AND VI SEMESTERS

Class & Sem.	III year V Sem.
Subject	JAVA
Annual/BL	Regular
Time	2 Hours
Max/Min	Marks 35/14

Date	12-11-2020
Time	8:00 to 10:00AM
Code No.	6510
Course	MECS
Roll No.	1062-18-474-401

Section- A Short Answers

I Answer any four (5) of the following

5X3=15Marks

Unit-1

Unit-2

Unit-3

Unit-4

Choose from any of the above unit

Section- B Long Answers

II Answer all the questions in 150 words

4X5 = 20 Marks

1. Unit-1

Or

Unit-1

2. Unit-2

Or

Unit-2

3. Unit-3

Or

Unit-3

4. Unit-4

Or

Unit-4

MOOCs [Massive Online Open Courses] Free Resources

E-Learning:

- § NPTEL :nptel.ac.in [Core Subjects Certification]
- § C++ INSTITUTE :cppinstitute.org [C++ Certification]
- § ORACLE EDUCATION :education.oracle.com [Java, DBMS Certification]
- § BIG DATA UNIVERSITY :bigdatauniversity.com [Big Data Certification]
- § COURSERA :coursera.org [Core Subjects Certification]
- § CODE ACADEMY :codecademy.com [Coding Certification]
- § KHAN ACADEMY :khanacademy.org [Core Subjects Certification]
- § PIXAR IN A BOX :khanacademy.org/partner-content/pixar
- § VIDEO LECTURES :videolectures.net
- § YOUTUBE EDU :plus.google.com/+YouTubeEDU/posts
- § DISNEY RESEARCH :disneyresearch.com
- § ALISON :alison.com [Core Subjects Certification]
- § INTERNET ARCHIVE :archive.org

Freeware:

- § SCILAB : scilab.org [MatLab Equivalent]
- § GEOGEBRA : geogebra.org [Software for Class Room Teaching]

Search Engine:

- § WOLFRAM ALPHA : wolframalpha.com [Computing Engine]
- § CITESEER : citeseerx.ist.psu.edu [Searching Research Articles]
- § DOAJ : doaj.org [Open Access to Journals]

PYTHON PROGRAMMING

Python Programming is intended for software engineers, systems analysts, program managers and user support personnel who wish to learn the Python programming language.

Prerequisites

Experience with a high level language (C/C++, Java, MATLAB) is suggested. Prior knowledge of a scripting language (Perl, UNIX/Linux shells) and Object-Oriented concepts is helpful but not mandatory.

Learning Objectives

The learning objectives of this course are:

- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To learn how to use indexing and slicing to access data in Python programs.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to build and package Python modules for reusability.
- To learn how to read and write files in Python.
- To learn how to design object-oriented programs with Python classes.
- To learn how to use class inheritance in Python for reusability.
- To learn how to use exception handling in Python applications for error handling.