

Syllabus for Diploma in Advanced Information Technology (DAIT)

Number of subjects in each semester

1. The Diploma course will be 2 Semester duration each covering a period of 6 months.
2. The entire Course will be subdivided into five broad modules.
3. Each subject will be of theory classes of 60 minutes duration with a credit of 2.0.
4. Each laboratory class will be of 2:30 hour duration with a credit of 1.0.
5. Each module will be of 6 credits, 04 for theory classes and 02 for each practical paper.

Marks and examinations

1. The Course should have at least three (03) periodical tests (internal examination) of 20 marks, the best score of two class tests marks out of a maximum marks of 20+20=40 scored by a student will be counted for addition to the end semester theory paper marks of 80. The internal should account for 20 marks only.
2. Students will be required to give a seminar presentation at the end of a module with a report write up on any topics assigned to them. The topic will be assigned by the class teacher on the respective theory topic. The maximum marks for this presentation is 20 and is to be substituted by the third internal examination.
3. The total mark for a theory paper will be 100 i.e. 80 for end Semester written examination + 20 for class test.
4. Each laboratory / practical paper will carry maximum marks of 50.
5. The maximum marks for each paper will be 100 for theory and 50 for practical.
6. The marks will be converted in to a 10 point grade as per the following rules.

Theory paper			Practical		
Marks	Grade	Grade point	Marks	Grade	Grade point
90% and above	O	10	90% and above	O	10
80% to 89%	A	9	80% to 89%	A	9
70% to 79%	B	8	70% to 79%	B	8
60% to 69%	C	7	60% to 69%	C	7
50% to 59%	D	6	50% to 59%	D	6
35% to 49%	P	5	35% to 49%	P	5
Below 35%	F	0	Below 35%	F	0

P stands for pass

7. A student has to score a minimum of 5 Semester Grade Point Average (SGPA) and pass in all subjects, both theory and practical in order to qualify for the next semester.
8. A student failing (Grade F) in one or more theory papers in a semester but securing a minimum of 5 SGPA will have to clear the paper in which the student has failed by reappearing in a separate test(s) on payment of additional fees of Rs. 500 per paper failed for which the tests will be carried out by the respective subject teacher.
9. A student has to pass the laboratory classes in one chance and no reexamination will be allowed in laboratory class.
10. Failure in more than two subjects in a semester or obtaining less than 5 SGPA in a semester even while passing in all subjects (Grade P) will debar a student to continue the course.
11. The grading system of project and viva-voce will be as that of the practical.



Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA).

$$SGPA = \frac{\sum_{i=1}^{n=4} (\text{no. of credit in theory} \times \text{grade obtained} + \text{no. of credit in lab} \times \text{grade obtained})}{10}$$

$$CGPA = \frac{\sum_{i=1}^{i=4} ((SGPA \text{ of } i \text{ th Semester} \times \text{no. of credits of } i \text{ th Semester})}{40}$$

In order to be eligible for the Diploma in Geographical Information Systems, Remote Sensing & Geocomputations a student has to pass in all subjects, both theory and practical as well as project and viva-voce and secure a CGPA of 5.0.

Module 1: Introduction to Programming using C

Overview of C

Constants, variables & data types

Operators and expressions

Managing input and output operators

Decision-making and branching/Looping.

Arrays, handling of character Strings.

User-defined functions

Structures and unions

Pointers, file management in C

Dynamic memory allocations in relation to array (Use malloc(), calloc(), realloc(), free())

Overview of Pre-processor statements.

Program through Command Line Arguments

Books

1. Programming with C, Gottfried, TMH
2. C The Complete Reference, Schildt, TMH
3. Practical C Programming, 3rd Ed, O'Reilly, SPD/O'REILLY
4. A First Course in programming with C, Jeyapooan, VIKAS
5. The C answer Book, Tondo, 2nd Ed, PHI
6. C Programming Made Easy, Raja Ram, SCITECH
7. Projects Using C, Varalaxmi, SCITECH
8. Mastering Algorithms With C, Loudan, SPD/O'REILLY

Module 2: Data Structure & Algorithms

Algorithm concept, Complexity – Big O- Notation, time space trade-off.

Array- Row/Column major representation, sparse matrix, shifting.

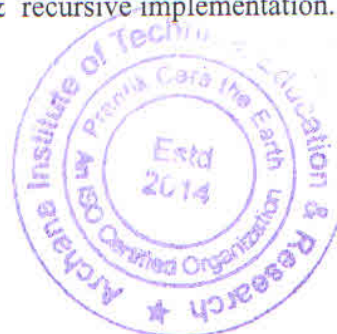
Linked List- Singly, circular, doubly, doubly & circular

Stack- Push, Pop, Conversion from infix – to postfix, evaluation of postfix expression.

Stack representation using array & linked list.

Queue – insert, delete, representation using array & linked list, circular queue (operations), deque(operations), priority queue(operations)-Both iterative & recursive implementation.

Garbage collection-different techniques.



Tree- definition – traversal algorithms (pre, post, in).

Threaded tree (One Way & Two Way), heap tree, Avl tree-balancing, B-tree, Binary search tree, Huffman algorithm, Creation of Heap.

Sorting with complexity analysis – bubble, merge, quick, selection, insertion, shell, tournament, radix, heap.

Search- Linear & Binary (Complexity Analysis).

Recursion Technique- overview including tail recursion.

Hashing- definition. Functions- Midsquare, Folding, remainder, Collision resolution & linear probing.

Overview On – Sequential file, random access file, indexed sequential, hash file.

Books:

1. Data Structure Using C, Ajay Agarwal, Cyber Tech
2. Data Structure Using C, Radhakrishnan & Shrinivasan, ISTE/EXCEL
3. C and Data Structures, Radhaganesan, Scitech
4. Data Structure Using C & C++, Tannenbaum, PHI
5. Data Structures & Program Design in C, 2nd Ed, Kruse, Tondo & Leung, PHI
6. Mastering Algorithms With C, Loudan, SPD/O'REILLY

Module 3: Database Management Systems

Introduction to DBMS, architecture, administration roles, data dictionary, Traditional models, three-level architecture, hierarchical model, network model and relational model Relational model – definitions and properties, relational algebra, joins, set operations, Tuple relational calculus and Domain relational calculus.

SQL constructs, PL/SQL, Query & its optimization techniques

Singled valued functional dependencies.

Database design, conceptual, logical and physical models, ER diagram and model, normal forms (1, 2, 3, BCNF).

Storage structure- Sequential, Indexed Sequential.

Indexing- Primary, Secondary, Multi-Level.

Books:

1. Data Base System Concepts, Silverchatz, Korth & Sudarshan, TMH.
2. Data Base Management Systems, Majumder & Bhattacharyya, TMH
3. Oracle PL/SQL Programming, Feuerstein, SPD/O'REILLY
4. Data Base Management System, A.K. Pujari, ISTE/EXCEL
5. Fundamentals of Data Base Mgmt. System, Vig & Walia, ISTE/EXCEL
6. Data Base Management Systems, Leon, VIKAS
7. Data Base Processing: Fundamentals, Design & Implementation, Kroenke, PHI
8. SQL PL/SQL for Oracle 8 & 8i, P.S Deshpande, Wiley Dreamtech
9. Data Base Management Systems, V.K Jain, Wiley Dreamtech
10. Beginning SQL Programming, Kauffman, SPD/WROX

Module 4: Advanced Programming using Java

Oops Concept and Introduction to JAVA

An overview of Java

Data Types - variables and arrays

Operators, Control statements



Classes and objects, Inheritance, String and StringBuffer, Packages, Interfaces, Exception handling, Multithreaded Programming, Applets, Eventhandling
Abstract Window Toolkit

Books:

1. Object Oriented Programming with JAVA, TMH
2. Beginning JAVA 2: SDK 1.4, Horton, SPD/WROX
3. JAVA 2: The Complete Reference, Schildt, TMH
4. Programming in JAVA, EXCEL BOOKS
5. Object Oriented Programming with C++ & Java, Samanta, PHI
6. Object Oriented Application, Development using JAVA, Doke, VIKAS
7. Programming with Java 2, Xavier, Scitech
8. Projects on Java 2, Xavier, Scitech

Module 5: PHP

Fundamentals- PHP Basic syntax, PHP data Types, PHP Variables, PHP Constants, PHP Expressions, PHP Operators, PHP Control Structures, PHP Loops

Arrays- PHP Enumerated Arrays, PHP Associative Arrays Array Iteration, PHP Multi-Dimensional Arrays, Array Functions

Functions- PHP Functions, Syntax, Arguments, Variables, References, Pass by Value & Pass by references, Return Values, Variable Scope, PHP include(), PHP require()

Forms- PHP Form handling, PHP GET, PHP POST, PHP Form Validation, PHP Form Sanitization

PHP Strings Handling- Strings and Patterns, Matching, Extracting, Searching Replacing, Formatting, PCRE

Books:

1. Core PHP Programming by Leon Atkinson. Prentice Hall PTR.
2. Creating Your Web Site with PHP by Dmitriy Koterov.
3. Beginning PHP4 Programming by John Blank, et al . Wrox Press Ltd.
4. PHP and MYSQL for Dummies by Valade. John Wiley & Sons Inc.

Module 6: MySql

Theory, Terminology and Concepts- Client/Server Concepts, Database and Database Objects

Data Definition using SQL- Databases, Data Types, Tables, Constraints and Indexes, Views

Basic Data Manipulation using SQL- Recurring SQL Constructs, Adding data, Modifying data, removing data, Searching data

Advanced Data Manipulation using SQL- Expressions, Grouping and Aggregate Functions, Joining Tables

Books:

1. MySQL Administrator's Bible , by Sheeri K. Cabral and Keith Murphy
2. MYSQL in a Nutshell , by Russell Dyer
3. MySQL (4th Edition) , by Paul DuBois.
4. MySQL Stored Procedure Programming , by Guy Harrison, Steven Feuerstein

