

**NORTH MAHARASHTRA UNIVERSITY,
JALGAON**



**Syllabus for
S. Y. B. Sc.
(Semester Pattern)
Information Technology
(w. e. f. June 2016)**

SCIENCE FACULTY
North Maharashtra University, Jalgaon
S. Y. B. Sc.(Information Technology)
(Semester Pattern)
(w.e.f. June 2016)

Course Title	Periods	Marks: Ext.	Int.
IT 211 : Data Structure-I	60	60	40
IT 212 : Programming in C#	60	60	40
IT 213 : Practical Course		60	40
IT 221 : Data Structure-II	60	60	40
IT 222 : Web Programming using ASP.NET	60	60	40
IT 223: Practical Course		60	40

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Note :-

- 1. Each period is of 48 minutes duration.**
- 2. Each course is having weightage of four periods per week.**
- 3. Each practical course is having weightage of four periods per week.**
- 4. Question paper will be of 90 marks, students have to attempt 60 marks.**

Chairman B. O. S.

**Dean Sci. Faculty
North Maharashtra University, Jalgaon**

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Sem - I Paper - I

IT 211 : Data Structure – I

Unit 1. Introduction to Data Structure & Algorithm Notations (L :12, M: 18)

- 1.1 Introduction to Data Structure,
- 1.2 Types of data structure 1. Primitive 2. Non Primitive 3. Linear 4. Non linear
- 1.3 Need of data structure
- 1.4 Algorithm Notations.
 - a. Format Convention
 - b. Name of Algorithm
 - c. Introductory Comment
 - d. Steps
 - e. Comments
- 1.5 Data Structure
 - a. Arrays
 - b. Dynamic Storage allocation
 - c. Functions
 - d. Procedures

Unit 2. Introduction to Algorithm analysis for Time and Space Requirement (L: 6, M:12)

- 2.1 Rate of Growth
- 2.2 Basic time analysis of an algorithm
- 2.3 Order Notation
- 2.4 More timing Analysis
- 2.5 Space analysis of an algorithm

Unit 3. Stacks (L: 12, M:15)

- 3.1 Definition and concept
- 3.2 Representations – static
- 3.3 Operations – push, pop, peep, change
- 3.4 Applications – infix to postfix & prefix, postfix evaluation, Recursion using stack
- 3.5 Concept of Multiple stacks

Unit 4. Queues (L: 12, M :15)

- 4.1 Concept, Definition and application
- 4.2 Representation – static
- 4.3 Operations- Insert, Delete
- 4.4 Circular queue : Concept, Operations – insert, delete
- 4.5 DeQue : Concept
- 4.6 Priority queues : Concept
- 4.7 Concept of Multiple Queues

Unit 5. Linked List**(L: 14, M: 21)**

5.1 Introduction to Linked list

5.2 Implementation of List – Dynamic representation.

5.3 Types of Linked List

a. Singly Linked list

b. Circular linked list

c. Doubly linked linear list

5.4 Operations on linked list – Insert, delete, search, copy, replace, reverse

5.5 Applications of linked list – polynomial manipulation

5.6 Generalized list – Concept & representation

Unit 6 File Structure**(L :4 , M :9)**

6.1 Introduction to file

6.2 Sequential File concept

6.3 Index Sequential File concept

6.4 Direct file concept

References :

1. Jean-Paul Trembley, Paul. G. Soresan, An introduction to data structures with applications, Mc-Graw Hill International Editions
2. Horowitz, Sahani, Data Structures : Galgotia publication
3. Aho, Hopcroft, Ulman, Data Structures and Algorithms
4. Niklaus wirth, Algorithms- Data Structures = Programs.
5. Tannenbaum, Data Structures using C and C++; PHI.
6. Thoms Horbron, -File systems – Structures and algorithms; PHI. I
7. Bonald Knuth, - Art of ITuter Programming Vol. I;

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Sem – II Paper – I
IT-221: Data Structure – II

Unit 1. Tree **(L: 14, M :21)**

- 1.1 Definition and Concept
- 1.2 Binary tree
- 1.3 Storage representation and Manipulation of Binary trees
 - a.Sequential Storage representation of Binary Tree
 - b.Linked Storage representation of Binary Tree
 - c.Threaded storage representation of Binary Tree
- 1.4 Operations on Binary tree - Traversing
- 1.5 Operations & Algorithms on BST – Create, Insert, Delete
- 1.6 Concept : AVL tree. B- tree

Unit 2. Graph **(L: 12, M:21)**

- 2.1 Definition and Concept
- 2.2 Matrix representation of graph
- 2.3 List Structures
- 2.4 Multi list representation of Graph
- 2.5 Traversal of graph : Breadth First Search and Depth First search
- 2.6 Applications of graph

Unit 3. Sorting **(L :18, M :24)**

- 3.1 Introduction
- 3.2 Sorting Techniques :
 - 3.2.1 Selection Sort
 - 3.2.2 Insertion sort
 - 3.2.3 Bubble Sort
 - 3.2.4 Merge Sort
 - 3.2.5 Tree Sort
 - 3.2.6 Quick Sort
 - 3.2.7 Radix Sort
 - 3.2.8 Sorting Method Comparison on Time and space Complexity attribute

Unit 4. Searching Techniques **(L:10, M:15)**

- 4.1 Sequential Searching
- 4.2 Binary searching
- 4.3 Hash Table Method
 - 4.3.1 Introduction
 - 4.3.2 Hashing Function
 - 4.3.3 Collision Resolution Technique

Unit 5. Introduction to Algorithm Design Techniques **(L:6, M:9)**

- 5.1 Divide and Conquer technique
- 5.2 Greedy techniques
- 5.3 Dynamic Programming

5.4 Back Tracking.

References :

1. Jean-Paul Trembley, Paul. G. Soresan, An introduction to data structures with applications, Mc-Graw Hill International Editions
2. . Horowitz, Sahani, Data Structures; Galgotia publication
3. Aho, Hopcroft, Ulman, Data Structures and Algorithms
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Sem - I Paper – II

IT-212:Programming in C#

Unit-1 .NET Architecture	[L-6 M:8]
1.1 The .NET Framework	
1.2 The Relationship of C# to .NET	
1.2 The Common Language Runtime	
1.2 Compiling to Native Code and Execution	
1.4 The Common Language Infrastructure	
1.5 Compilation and Execution of .NET Program	
1.5 The Evolution of C#	
Unit-2 Overview of C#	[L-6 M:12]
2.1 Program Structure and Simple C# program	
2.2 MS Visual Studio.NET IDE and Console Applications	
2.3 Namespaces, Adding Comments, Multiple Main() methods	
2.4 Using Aliases for Namespace Classes	
2.5 Passing String Objects to WriteLine Method, Command Line arguments	
2.6 Providing Interactive Input	
2.7 Using Mathematical Functions	
Unit-3 Literal, Variables and Data Types	[L-8 M:10]
3.1 Introduction	
3.2 Literal, variable naming rules and conventions	
3.3 Static Variables, Instance Variable	
3.4 Data Types, Values Type, References Types	
3.5 Declaration of variables, Initialization of variables	
3.6 Default values, Constant Variables, Scope of Variables	
Unit-4 Operator and Expressions	[L-8 M:14]
4.1 Introduction	
4.2 Various Operators	
4.3 Operator Overloading	
4.4 Arithmetic Expression, Evaluation, Precedence	
4.5 What Are Conversions, Implicit Conversions, Explicit Conversions and user defined Casting, Boxing and Unboxing	
Unit-5 Decision Making and Methods	[L-12 M:8]
5.1 Branching Statements	
5.2 Looping Statements	
5.3 Declaring Method	
5.4 Nesting Method, Method Parameter	
5.5 Method Overloading	

Unit-6 Arrays and Strings**[L-4, M-10]**

- 6.1 One Dimensional Array, Two Dimensional Arrays
- 6.2 Variable-Size Array
- 6.3 ArrayList Class
- 6.4 Creating String, String Methods
- 6.5 Array of String

Unit-7 Structure and Enumeration**[L-4, M-10]**

- 7.1 Structures, Structs with method
- 7.2 Calling Struct Constructor
- 7.2 Nested Structs, Difference between Classes and Structs
- 7.3 Enumeration, Initialization, Enumerator Basic Types

Unit-8 Class and Object**[L-12, M-18]**

- 8.1 Basic Principal of OOP, Defining Class
- 8.2 Adding Method, Adding Variables, Member Access Modifiers
- 8.3 Creating Object, Accessing Class Member
- 8.4 Constructors, Overloaded Constructors, Destructors
- 8.5 Class members: Methods, Properties and Indexers
- 8.5 Inheritance : Classical Inheritance, Containment Inheritance
- 8.6 Abstract Members, Abstract Classes,
- 8.7 Sealed Classes, Static Classes, Extension Methods
- 8.6 Polymorphism ,Method Overriding ,Method hiding

References:

1. Professional C# 2008 by Christian Nagel, Bill Evjen, Jay Glynn, Morgan Skinner, Karli Watson by Wiley Publishing Inc. ISBN: 978-0-470-19137-8
2. Simple Step in C# By Kogent Solutions Inc
3. Black Book of C#, Dreamtech Press

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Sem - II Paper – II

IT-222:Web Programming using ASP.NET

Unit-1 Introduction **[L-12, M-16]**

History of Asp.Net, Introduction to Asp.Net, Features of Asp.Net ,Structure of Asp.Net Page,ASP.Net Compilation Model, Code Behind Model Execution Stages and Event Model for the Page Class.

Unit-2 ASP.NET Controls **[L-14, M-18]**

Introducing Web Forms, HTML Controls, Web Controls, Miscellaneous Basic Controls, Repeater, DataList, DataGrid/GridView controls, ASP.Net Rich Controls, Validation Controls, ASP.Net Page Directives, User Controls.

Unit-3 ASP.Net Intrinsic Objects **[L-12, M-18]**

HttpRequest Object, HttpResponse Object, HttpServerUtility, HttpApplicationState Object, HTTP Session state Object, Object Context object.

Unit-4 Web Site Designing **[L-10, M-18]**

Webpage designing Principals: page layout, styles and text balance, site map, Master pages and content Pages, Navigation controls:Tree view, site map path(bread crumb), Menu navigation

Unit-5. Data Access With ADO.Net Object **[L-12, M-20]**,

ADO.Net architecture, Working With ASP.Net Object, Data Reader Object, Data Adaptor, Dataset anatomy, Connection object, Command object, Data Table Object, DataRow Object, DataColumn Object, DataRelation Object.

Books References:-

1. NET 4.0 Programming 6 in 1 Black Book, by Kogent Learning Solutions, Dreamtech Press,2013.
2. Professional ASP.NET 1.0, Richard Anderson, Brian Francis, Alex Homer, Rob Howard, David Sussman, Karli Watson ISBN 1-861007-0-3-5.
3. Beginning ASP.NET 2.0, Chris Hart, John Kauffman, Dave Sussman, and Chris Ullman, Wiley Publishing, Inc. ISBN-13: 978-0-7645-8850-1, ISBN-10: 0-7645-8850-8. 2. Crouch, Matt J, Asp.Net and Vb.Net Web Programming, Addison-Wesley, 2002.
4. Programming ASP.Net,J.Liberty,D.Hurwitz, 3rd Edition.

WEB References:-

1. <http://www.tutorialspoint.com>
2. <http://www.asp.net/web-forms/videos>.

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Sem - I Paper – III
IT 213 : PRACTICAL COURSE

PRACTICALS BASED ON DATA STRUCTURE : I

Note : Implement all practicals using 'C' Language

1. Write a program to implement Stack operations : push,pop,peep,change,Display
2. Write a program to convert given infix expression into postfix.
3. Write a program to implement Linear Queue operations : Insert, Delete, Change, Display
4. Write a program to implement Circular queue with its operations.
5. Write a program to implement singly linked list with operations.
i)create ii)insert iii)delete iv)find v) Search
6. Write a program to implement doubly linked list with operations.
i)create ii)insert iii)delete.

Lab on C#

- 1) Demonstrate Simple Console Application
- 2) Demonstrate Arithmetic Operator
- 3) Demonstrate Control Statement
- 4) Demonstrate Looping Statement
- 5) Demonstrate Array
- 6) Demonstrate different String Operation
- 7) Demonstrate structure and Enumeration
- 8) Demonstrate use of Class
- 9) Demonstrate Constructor, Destructure
- 10) Demonstrate Polymorphism
- 11) Demonstrate Inheritance

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Sem - II Paper – III
IT 223 : PRACTICAL COURSE

PRACTICALS BASED ON DATA STRUCTURE : II

1. To Create a tree and Implement following Tree Traversal Techniques:
i)inorder ii)preorder iii)postorder.
2. To Create Binary Search Tree
3. Implement following Graph Search Techniques:
i) BFS
ii) DFS.
4. Implement Selection Sort technique.
5. Implement Bubble and Insertion Sort techniques.
6. Implement Merge Sort technique.
7. Implement Quick Sort technique.
8. Implement: i)Linear Search ii) Binary Search

Lab on ASP.NET

- 1) Write an ASP .net program that demonstrate use of HTML Controls
- 2) Write an ASP .net program that demonstrate use of web controls.
- 3) Write an ASP .net that return the windows name of your computer and URL of the page that you are visiting.
- 4) Write an ASP .net program that demonstrate use of Validations Controls.
- 5) Write an ASP .net program that demonstrate use of Intrinsic Objects.
- 6) Write an ASP .net program that demonstrate Application and Session Scope Variables using Global.Asax
- 7) Write an ASP .net program that demonstrate Page directives.
- 8) Write an ASP .net page that used the connection object to connect the database and display information using datagrid Controls.
- 9) Demonstrate Master Pages and website navigation controls(sitemap path, treeview, menu) using SiteMap file.
- 10) Demonstrate Properties of website navigation controls.