Deccan Education Society's

FERGUSSON COLLEGE, PUNE

(AUTONOMOUS)

SYLLABUS UNDER AUTONOMY

SECOND YEAR B.Sc.(COMPUTER SCIENCE)

COMPUTER SCIENCE

SEMESTER –III

w.e.f. Academic Year 2017-2018

Deccan Education Society's
Fergusson College (Autonomous), Pune
Faculty of Science
S.Y. B.Sc. (Computer Science)

Syllabus of Computer Science

SEMESTER – III				
Subject	**Paper Code**	**Paper Title**	**Number of Lectures**	**Credits**
Computer Science	CSC2301	Data Structures using C	48	3
	CSC2302	Introduction to Web Technologies	48	3
	CSC2303	Data Structures using C: Lab	10 sessions	2
	CSC2304	Introduction to Web Technologies: Lab (not to be included for calculating CGPA)	10 sessions	Grade

SEMESTER – IV				
Subject	**Paper Code**	**Paper Title**	**Number of Lectures**	**Credits**
Computer Science	CSC2401	Object Oriented Concepts using C++	48	3
	CSC2402	PHP Programming	48	3
	CSC2403	Object Oriented Concepts using C++ : Lab	10 sessions	2
	CSC2404	PHP Programming: Lab (not to be included for calculating CGPA)	10 sessions	Grade

Paper Code: CSC2301

Course objectives:

After learning the course the students should be able to:

1. Differentiate primitive and non primitive structures
2. Design and apply appropriate data structures for solving computing problems.
3. Apply sorting and searching algorithms to the small and large data sets.

PAPER CODE:CSC2301
PAPER –I: Data Structures using C
[Credits - 3: No. of Lectures 48]

	Title and Contents	No. of Lectures
Unit –I	**Introduction to Data Structure and algorithm analysis** 1.1 Concept, 1.2 Data Type, Data Object, Abstract Data Type(ADT), 1.3 Types of Data Structure, 1.4 Applications of Data Structure. 1.5 Algorithm types , 1.6 Algorithm Analysis : Complexity (Time, Space),Asymptotic Notations (big O notation)	**6**
Unit -II	**Linear Data Structure** 2.1Array 2.1.1 Array as ADT 2.2.2 Representation 2.2.3 Application (Sorting, Searching, Polynomial handling) 2.2 Stack 2.2.1 Introduction 2.2.2 Static representation of Stack 2.2.3 Operations(Push, Pop, Display) 2.2.4 Recursion, multiple stack 2.2.5 Applications (Parenthesis balancing, polish notation) 2.3 Queue 2.3.1 Introduction 2.3.2 Static representation of queue 2.3.3 Operations(Insert, Delete, Display) 2.3.4 Types of queue(Circular, Priority,	**24**

	Dequeue) 2.4 Linked List 2.4.1 Introduction, types (singly, doubly, circular) 2.4.2 Representation (Static, dynamic) 2.4.3 Operations on linked list(Create, insert, delete, Search, traverse) 2.4.4 Dynamic implementation of stack and queue using singly linked list 2.4.5 Generalized linked list (Concept, Example) 2.4.6 Applications (Polynomial arithmetic)	
Unit –III	**Non Linear Data Structure** 3.1 Tree 3.1.1 Concept and terminologies 3.1.2 Binary Search Tree(BST) 3.1.3 Representation (Static, dynamic) 3.1.4 Operations on BST (Create, insert, delete) 3.1.5 Traversals(inorder, preorder, postorder), counting of nodes), 3.1.6 Application(Heap Sort, AVL tree) 3.2 Graph 3.2.1 Concept and terminologies, 3.2.2 Representation (Adjacency matrix, Adjacency list, Adjacency Multilist) 3.2.3 Traversal (BFS, DFS), 3.2.4 Applications (Shortest path algorithm : Dijkstra's algorithm) 3.2.5 AOV Network - Concept	**18**

References:

1. Fundamentals of Computer Algorithms by Horowitz, Sahni, Galgotia Pub. 2001 ed.

2. Data Structures using C & C++ -By Ten Baum Publisher – Prenctice-Hall International.

3. An Introduction to Data Structures with Applications. by Jean-Paul Tremblay & Paul G. Sorenson Publisher-Tata McGraw Hill.

4. Data Structures: A Pseudo-code approach with C -By Gilberg & Forouzan Publisher-Thomson Learning.

Paper Code: CSC2302

Course Objectives:

Students successfully completing this course will be able:

1. To understand different Web technologies.
2. To keep pace with the rapidly changing landscape of web application development.
3. To Design dynamic and interactive web pages.

PAPER CODE:CSC2302 **PAPER –II: Introduction to Web Technologies** **[Credits - 3: No. of Lectures 48]**		
	Title and Contents	**No. of Lectures**
Unit –I	**Introduction to Internet** 1.1 History of the Internet 1.2 World Wide Web Consortium (W3C) 1.3 Personal, Distributed and Client/Server Computing 1.4 Key Software Trend: Object Technology 1.5 Browser Portability 1.6 Software Technologies 1.7 Client Server Architecture	**4**
Unit -II	**Introduction to HTML5** 2.1 HTML Editors, HTML Basic 2.2 HTML Heading, Paragraph, formatting 2.3 HTML color, Link, Image 2.4 HTML Table 2.5 HTML Lists 2.6 HTML Block 2.7 HTML Iframe 2.8 HTML Layout 2.9 HTML Forms	**10**
Unit –III	**Cascading Style Sheets (CSS)** 3.1 Introduction, Syntax and selectors 3.2 Ways to insert CSS 3.3 CSS Properties – Colors, Background, Border, Margin, Padding, Height and Width 3.4 Text Formatting, List, Tables 3.5 Layout – The display property, The position	**8**

	property	
Unit –IV	**JavaScript** 4.1 Introduction to JavaScript 4.2 JavaScript Basics – Data Types, Control Structure 4.3 JavaScript Functions 4.4 Working with events 4.5 JS popup boxes 4.6 JavaScript Objects 4.7 JavaScript HTML DOM	**14**
Unit –V	**XML** 5.1 Introduction – Comparing XML with HTML, Advantages and Disadvantages of XML 5.2 XML document structure- XML declaration, elements, attributes, tree, comments, Entity references, XML parsers 5.3 Document Type Definitions (DTDs) – Single element, Nested element 5.4 XML namespaces, need of namespaces, namespace syntax, Scope of namespace declaration, default namespace, namespace with DTD 5.5 XML Schema 5.6 Document Object Model (DOM)	**8**
Unit –VI	**Emerging Trends in Web Technologies** 6.1 Introduction to – 6.1.1 CMS-Wordpress/Drupal/Joomla 6.1.2 jQuery 6.1.3 AngularJS 6.1.4 Bootstrap	**4**

References:

1. Internet & World Wide Web How to Program (4th Edition) by P.J. Deitel & H.M. Deitel, Pearson – Prentice Hall

2. HTML5 Black Book by Kogent Learning Solution Inc.

3. JavaScript – The definitive Guide by David Flanagan – O'Reilley Publication – 5th Edition.

4. Learning XML by Erik T. Ray - O'Reilley Publication

5. Beginning XML by Joe Fawcett, Liam R.E. Quin & Danny Ayers

Published by John Wiley & Sons, Inc.

6. . www.W3schools.com

7. https://codex.wordpress.org/WordPress_Lessons

PAPER CODE:CSC2303
Data Structures using C:Lab
[Credits - 2: No. of Sessions 10]

Sr. No.	Title of Experiment/ Practical
1	Sorting Technique(Insertion, Selection, Quick, Merge)
2	Polynomial manipulation using array
3	Stack
4	Queue
5	Linked list
6	Tree
7	Graph
8	Dynamic Implementation (Stack or Queue)
9	Tree Application : Heap Sort
10	Graph Traversals (BFS/DFS)

PAPER CODE:CSC2304
PAPER –IV: Introduction to Web Technologies: Lab
[No. of Sessions 10]

Sr. No	Title of Experiment/ Practical
1	Creating Simple HTML5 pages
2	Advance HTML5- lists, frames
3	HTML forms
4	CSS I – Internal , Inline CSS
5	CSS II – External CSS
6	JavaScript – I (JavaScript basics, functions, Popup boxes)
7	JavaScript – II (Events, HTML DOM, DOM CSS)
8	XML
9	Case study I
10	Case Study II

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SECOND YEAR B.Sc.(COMPUTER SCIENCE)

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SEMESTER –IV

w.e.f. Academic Year 2017-2018

Paper code: CSC2401
Course objectives:

1. Acquire an understanding of basic object oriented concepts and the issues involved in effective class design
2. Write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc.

PAPER CODE:CSC2401 **PAPER –I: Object Oriented Concepts using C++** **[Credits – 3: No. of Lectures 48]**		
	Title and Contents	**No. of Lectures**
Unit –I	**Object oriented concepts** 1.1 Object oriented concepts 1.2 Features, advantages and Applications of OOPS	**2**
Unit -II	**Introduction to C++** 2.1 Data types, new operators and keywords, using namespace concept 2.2 Simple C++ Program 2.3 Introduction to Reference variables 2.4 Usage of 'this' pointer 2.5 Classes and Objects 2.6 Access specifiers 2.7 Defining Data members and Member functions 2.8 Array of objects	**6**
Unit –III	**Function in C++ , Constructors and destructor** 3.1 Call by reference, Return by reference 3.2 Function overloading and default arguments 3.3 Inline function 3.4 Static class members 3.5 Friend Concept – Function, Class 3.6 Types of constructors 3.7 Memory allocation (new and delete) 3.8 Destructor	**12**
Unit –IV	**Operator overloading** 4.1 Overloading Unary and Binary operators 4.2 Overloading using friend function	**4**

	4.3 Type casting and Type conversion	
Unit –V	**Inheritance** 5.1 Types of inheritance with examples 5.2 Constructors and destructor in derived classes 5.3 Virtual base classes, Virtual functions and Pure virtual function 5.4 Abstract base classes	**8**
Unit –VI	**Managing Input and Output using C++** 6.1 Managing console I/O 6.2 C++ stream classes 6.3 Formatted and unformatted console I/O 6.4 Usage of manipulators	**4**
Unit –VII	**Working with files** 7.1 File operations – Text files, Binary files 7.2 File stream class and methods 7.3 File updation with random access 7.4 Overloading insertion and extraction operator	**6**
Unit –VIII	**Templates** 8.1 Introduction to templates 8.2 Class templates, function templates and overloading of function templates 8.3 Templates with multiple parameters	**4**
Unit – IX	**Exception Handling in C++** 9.1 try, catch and throw primitives	**2**

References:

1. Object Oriented Programming with C++ by Robert Lafore
2. Object Oriented Programming with C++ by E. Balagurusamy
3. Object Oriented Modeling and Design by James Rumbough
4. The Complete Reference C++ by Herbert Schildt
5. Let us C++ by – YashwantKanitkar
6. Mastering C++ by Venugopal, T Ravishankar, RajkumarTHM Pub.
7.Trouble free C++ by HarimohanPande, ANE publication

Paper code: CSC2402
Course objectives:

1. To understand server side technologies and the issues involved in interactive and dynamic web design
2. Writing PHP programs using OOPs techniques, database connectivity and AJAX

PAPER CODE:CSC2402 PAPER –II: PHP Programming [Credits -3: No. of Lectures 48]		
	Title and Contents	**No. of Lectures**
Unit -I	**Introduction to PHP** 1.1 Introduction to Web server and Web browser 1.2 HTTP Basics 1.3 Language Basics 1.4 Functions in PHP	**4**
Unit -II	**Web Techniques** 2.1 HTTP Basics 2.2 Variables 2.3 Server Information 2.4 Processing Form 2.5 Setting Response Headers 2.6 Maintaining State	**6**
Unit –III	**String and Arrays** 3.1 Creating and accessing String 3.2 Searching and Replacing String 3.3 String Related Library function 3.4 Regular Expression 3.5 Arrays and pointers 3.6 Creating arrays 3.7 Index and Associative array 3.8 Working on array 3.9 Sorting array	**14**

	3.10 Array Related Library function	
Unit –IV	**Working with file and Directories** 4.1 Introduction to file 4.2 working with file 4.3 Introduction to directory 4.4 working with directory 4.5 File uploading and downloading	**6**
Unit –V	**Introduction to OOPs** 5.1 Introduction 5.2 Classes and Objects 5.3Constructors and Destructor 5.4 Inheritance 5.5 Serialization 5.6 Abstract method and class 5.7 Interface 5.8 Exception Handling-Understanding Exception and error, try, catch, throw	**8**
Unit –VI	**Database Connectivity with PostgreSQL** 6.1 Connection with PostgreSQL Database 6.2 Performing basic database operation(DML) (Insert, Delete, Update, Select) 6.3 Setting query parameter 6.4 Executing query 6.5 Mini Project	**6**
Unit - VII	**AJAX** 7.1 Introduction to AJAX 7.2 PHP with AJAX 7.3 Working with database	**4**

References:

1. Programming PHP By Rasmus Lerdorf and Kevin Tatroe, O'Reilly publication
2. Beginning PHP 5.3 , by Matt Doyle, Wrox publication
3. AJAX Black Book, Kogent solution
4. Mastering PHP , BPB Publication

5. PHP cookbook, O'Reilly publication
6. PHP for Beginners, SPD publication
7. Programming the World Wide Web , Robert W Sebesta(3rd Edition)
8. www.php.net.in
9. www.W3schools.com
10. www.wrox.com

PAPER CODE:CSC2403
Object Oriented Concepts using C++ : Lab
[Credits -2: No. of Sessions 10]

Sr. No	Title of Experiment/ Practical
1	Class and Objects
2	Constructor and Destructor
3	Inline function, friend function, default argument
4	Function Overloading.
5	Operator overloading.
6	Inheritance
7	Formatted Input/ Output
8	File Handling
9	Template
10	Exception handling

PAPER CODE:CSC2404
PAPER –IV: PHP Programming : Lab
[No. of Sessions 10]

Sr. No	Title of Experiment/ Practical
1	Functions in PHP
2	Web Techniques
3	Strings in PHP/working with strings
4	Working with arrays
5	Working with Files and Directories
6	Object Oriented Concepts
7	Database Connectivity (PostgreSQL)
8	AJAX
9	Case Study I
10	Case Study II