ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS)

CUDDALORE-1

PG & RESEARCH DEPARTMENT OF

COMPUTER SCIENCE

B.Sc(Computer Science)

SYLLABUS 2016-2017

PG and Research Department of Computer Science
B.Sc Computer Science (Template)

Semester	Code	Part	Subject Title	Hours	Credit
I	LT101T/LH101S/LF101	I	Tamil-I / Hindi-I / French-I	4	3
	LE101T	II	Functional English – I	4	3
	CS101S	III	Programming in C	4	3
	CS102S	III	**Digital Logic Fundamentals**	4	3
	CSP101S	III	Practical - Programming in C	3	2
	AMCS101S	III	Allied Mathematics – I	8	5
	VE101T	IV	Value Education	3	2
			Total	**30**	**21**
II	LT202T/LH202S/LF202	I	Tamil-II / Hindi-II / French-II	4	3
	LE202T	II	Functional English – II	4	3
	CS203S	III	Programming in C++	4	3
	CS204S	III	Fundamentals of Data Structures	4	3
	CSP202S	III	Practical - Programming in C++	3	2
	AMCS202S	III	Allied Mathematics – II	8	5
	EBT201	IV	Basic Tamil	3	2
	EPD201T		Dynamics of Personality		
			Total	**30**	**21**
III	LT303T/LH303S/LF303	I	Tamil-III / Hindi-III / French-III	4	3
	LE303T	II	Functional English – III	4	3
	CS305S	III	Java Programming	4	4
	CS306S	III	Fundamentals of Algorithms	4	4
	CSP303S	III	Practical - Java Programming	3	2
	ASCS301Q	III	Statistical Methods for Computer Applications – I	8	4
	EVS301S	IV	Environmental Science	3	2
			Total	**30**	**22**

Semester	Code	Part	Subject Title	Hours	Credit
IV	LT404T/LH404S/LF404	I	Tamil-IV / Hindi-IV / French-IV	4	3
	LE404T	II	Functional English – IV	4	3
	CS407T	III	Advanced Java Programming	4	4
	CS408	III	Computer Graphics	4	4
	CSP404T	III	Practical - Advanced Java Programming	3	2
	ASCS402Q	III	Statistical Methods for Computer Applications – II	8	4
	AOSS401S	IV	Soft Skills	3	4
	ASCP401T	IV	Allied Practical – Statistical Methods for Computer Applications	-	2
			Total	**30**	**26**
V	CS509	III	Relational Database Management System	6	5
	CS510	III	C Sharp.Net Technology	5	5
	ECS511	III	Elective - I 1.Operating System*	6	5
	ECS511A		2. Cloud Computing		
	ECS512	III	Elective - I: 1. Computer Architecture*	5	5
	ECS512A		2. Electronic Commerce		
	CSP505	III	Practical - Oracle	3	2
	CSP506	III	Practical – C Sharp.Net Technology	5	2
			Total	**30**	**24**
VI	CS613	III	Data Communications and Networks	6	5
	CS614	III	ASP.Net Technology	5	5
	ECS615S	III	Elective - I: Software Engineering	6	5
	ECS615A		Elective - I:Management Information System		
	ECS616S	III	Elective - II: 1. Internet Programming*	5	5
	ECS616A		2. Multimedia		
	CSP607	III	Practical - ASP.Net Technology	5	2
	CSP608	III	Practical - Internet Programming*	3	2
	EU601		Extension Activities		2
			Total	**30**	**26**

I B.Sc, (CS)	PROGRAMMING IN C	CS101S
SEMESTER - I		HRS/WK-4
CORE - 1		CREDIT – 3

Objective:
To understand the basic concepts of a structured programming language.

UNIT – I **[10hrs]**
Basics Of C: C fundamentals Character set – Identifier and keywords – data types – constants– Variables – Declarations – Expressions – Statements – operators – Library functions.

UNIT – II **[10hrs]**
I/O and Control Statements: Data input output functions - Simple C programs - Flow of control – if, if- else, while, do-while, for loop, nested control structures – switch, break and continue, go to statements.

UNIT –III **[15hrs]**
Function and Storage classes: Function – Definition – Prototypes – Passing arguments – Recursion - Storage classes.

UNIT – IV **[15hrs]**
Arrays, Structures and Unions: Arrays – Defining and Processing – Passing arrays to functions – Arrays and string - Structures and Unions.

UNIT – V **[10hrs]**
Pointers and Files: Pointers – Declarations – Passing pointers to function – Operation on Pointers – Pointer and Arrays – Files and operation on files.

Text Books:

1. Programming in ANSI C by E.Balagurusamy.
2. Ashok N.Kamthane, Programming with ANSI and Turbo C, Pearson Education.

Reference Books:

1. B.W. Kernighan and D.M. Ritchie, the C programming Language.
2. H. Schildt, C: The Complete Reference, TMH Edition,.
3. Kanetkar Y., “Let us C”, BPB Pub., New Delhi.

I B.Sc (CS)	DIGITAL LOGIC FUNDAMENTALS	CS102S
SEMESTER - I		HRS/WK-4
CORE - 2		CREDIT - 3

Unit-I: Binary Systems : [10 hrs]

Digital Computers and Digital Systems - Binary Number System – Binary Addition – Binary Subtraction- Binary Multiplication and Division-Number Base Conversion: decimal, binary, octal, hexadecimal .

Unit-II: Boolean Algebra and Logic Gates : [10 hrs]

Basic Definitions of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra - Digital Logic Gates : AND, OR, NOT , NAND, NOR, Exclusive OR and Exclusive NOR Gates- DeMorgan's Theorem – Universal gates.

Unit-III: Simplification of Boolean Functions : [15 hrs]

Sum of Products and Product of Sums - Karnaugh Maps - Two and Three Variable Maps - Four Variable Map -Don't Care Conditions - Rolling the Map – Eliminating Redundant Groups.

Unit-IV: Combinational Logic Circuits: [15 hrs]

Adders: Half Adder,Full Adder – Subtractors: Half Subtractor,Full subtractor. - Binary Adder-BCD Adder – Encoder - Decoders – Multiplexers – Demultiplexers.

UNIT-V: Sequential circuits: [10 hrs]

Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Master Slave Flip Flop - Counters: – Asynchronous and synchronous Counter

Text Books

1. M. Morris Mano, "Digital Logic and Computer Design", PHI, 1996

2. Principles of Digital Electronics, Dr. K. Meena, PHI Learning Private Limited, New Delhi 2009.

Reference Books

1. Louis Neshelsky, "**INTRODUCTION TO DIGITAL TECHNOLOGY**", John Wiley & Sons, Third Edition, 1983. 2. Digital Logic Design – Ployd

2. **"Digital Logic Design Principles"** -Norman Balabanian , Bradley Carlson -John Wiley & Sons, Inc.

I B.Sc, (CS)	PRACTICAL - PROGRAMMING IN C	CSP101S
SEMESTER - I		HRS/WK-3
CORE-PRACTICAL -1		CREDIT - 2

Objective

To understand the working nature of a powerful programming language.

1. Control Statements
    a. Implementing Control statements
    b. Implementing Loop structures.
2. Summation of series
3. String Manipulation.
4. Sorting
    a. Bubble Sort
    b. Selection Sort
    c. Insertion Sort
5. Searching
    a. Linear Search
    b. Binary Search.
6. Matrix Manipulations
7. Recursion
8. File Handling - Mark sheet.

I B.Sc (CS)	PROGRAMMING IN C++	CS203S
SEMESTER - II		HRS/WK-4
CORE – 3		CREDIT - 3

Objective:
This paper deals with all the concepts involved in Object Oriented programming with reference to C++ .

UNIT –I [10 hrs]
OOP'S: Principles of Object Oriented Programming [OOP]: Evolution of C++ - Programming paradigms – Key concept of OOP – Advantages of OOP- Usage of OOP and C++ - Input and Output in C++ - Streams.

UNIT-II [10 hrs]
C++ Fundamentals and Functions: Stream classes-Unformatted console I/O Operations – Introduction to C++ - Tokens, Keywords, Identifiers, Variables, Operators, Expressions and Control structures in C++ pointers and arrays –Function in C++ - Main function– function prototyping –Parameters passing in Functions – Values Return by functions – Inline Functions –Function overloading.

UNIT-III [15 hrs]
Object Manipulation and Polymorphism: Classes and objects; Constructors and Destructors; and Operator Overloading and type Conversion –Friend and Virtual functions.

UNIT-IV [15 hrs]
Inheritance: Single Inheritance – Multilevel inheritance – Multiple inheritances – Hierarchical – Hybrid Inheritance - Virtual Base class-Virtual Functions and Polymorphism

UNIT-V [10 hrs]
Working with Files: Classes for File Stream Operation – Opening and Closing a File – End –of – File Detection – File Pointers-Updating a File – Error Handling during File Operation – Command-line Arguments.

Text Books:
1. E.Balagurusamy, Object Oriented Programming with C++.
2. The C++ Programming Language: Special Edition by Bjarne Stroustrup
3. C++ Primer by Stanley B. Lippman, Josie Lajoie, and Barbara E. Moo

Reference Books:
1. Ashok N. Kamthane, Object Oriented Programming with ANSI & Turbo C + +, Pearson Education, Practical C++ Programming, by Steve Oualline
2. C++ Without Fear: A Beginner's Guide That Makes You Feel Smart by Brian R. Overland

I B.Sc(CS)	FUNDAMENTALS OF DATA STRUCTURES	CS204S
SEMESTER – II		HRS/WK-4
CORE – 4		CREDIT - 3

Objective:
This subject will make the student to get acquire with different storage techniques and also make them to implement the logic using different algorithms.

UNIT –I **[10 hrs]**
Introduction to Data structure: Definition of a Data structure - Primitive and Composite Data types, Arrays, Operations on Arrays - Order Lists.

Unit-II **[10 hrs]**
Stacks and Queues: Stacks – Operation - Application of Stack - Infix to Postfix Conversion - Queues- Operations on Queues, Queue Applications - Circular Queue.

Unit – III **[15 hrs]**
Linked List: Singly Linked List - Representation of a Polynomial - Polynomial addition - Doubly Linked List.

Unit – IV **[15 hrs]**
Trees: Binary trees - Representation – Conversion of Forest to Binary tree - Tree Traversals.

Unit – V **[10 hrs]**
Graphs: Definition – Graph Representation - Types of Graphs - Shortest Path (Dijikistras Algorithm).

Text Books:

1. E. Horowitz, S.Sahni and Mehta – Fundamentals of "Data structures in C++" Galgotia.
2. R.Kruse and N.Dale and S.C. Lily – Pascal plus Data Structures Algorithms and Advanced Programming – Tata McGrawHill – New Delhi .
3. Data structures using C and C++ by Langsam, Augenstein and Tanenbaum, PHI/Pearson Education.

Reference Books:

S.E Goodman and S.T. Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mc Graw Hill, International Edition.Data Structures and Algorithm Analysis in C++ by Mark Allen Weiss, Pearson Education.

I B.Sc(CS)	PRACTICAL - PROGRAMMING IN C++ For the students admitted in the year 2010	CSP202S
SEMESTER - II		HRS/WK-3
CORE– Practical -2		CREDIT - 2

Objective:

To implement all object oriented programming concepts using C++ and to implement different data structures techniques using it.

1. Implementing class and Objects.
2. Implementing Inline function
3. Implementing Friend function.
4. Implementing Constructor and Destructor
5. Implementing Operator overloading
6. Implementing Inheritance.

DATA STRUCTURE USING C++

7. Implement PUSH, POP operations of stack using Arrays.
8. Implement add, delete operations of a queue using arrays.
9. Conversion of infix to postfix using stacks operations.
10. Binary tree traversals [In – order, Pre-order, and Post-order] using Recursion.

YEAR – II	JAVA PROGRAMMING	CS305S
SEMESTER - III		HRS/WK-4
CORE – 5		CREDIT - 4

Objective:
To understand the power of JAVA language in internet programming.

UNIT – I **10 hrs**
Fundamentals of Java Language: Introduction to Java – Features of Java – Object Oriented Concepts – Data Types – Variables – Arrays – Operators - Control Statements.

UNIT – II **15 hrs**
Inheritance, Polymorphism and Java Modifier: Classes – Objects – Constructors – Overloading method – Access control – Static and fixed methods – Inner classes – Inheritance – Overriding methods – Using super – Abstract class.

UNIT – III **10 hrs**
Packages, Interfaces and Exception Handling: Packages – Access Protection – Importing Packages – Interfaces – Exception Handling.

UNIT –IV **10 hrs**
Thread,I/O and File Stream: Thread – Synchronization - Runnable Interface – Multithreading - I/O Streams – File Streams .

UNIT – V **15 hrs**
String and Util Class : String Objects - String Buffer – Char Array - Java Utilities: Vector class, Random class, Calendar class, Date Class.

Text Books:
1. Cray S. Horstman, Gray Cornell – Core Java 2 Vol. I and Vol. II – 7th Ed. PHI, 2000.
2. H. Schildt – Java2 (The Complete Reference) – Fourth Edition, TMH 1999.
3. Java 2 Platform Unleashed by

Reference Books:
1. Wesley, K. Arnold and J. Gosling – The Java Programme Language Addison.
2. Java How to Program by H.M.Dietel and P.J.Dietel, Pearson Education/PHI, Sixth Edition
3. Beginning in Java 2 by Iver Horton, Wrox Publications

YEAR – II	FUNDAMENTALS OF ALGORITHMS	CS306S
SEMESTER - III		HRS/WK-4
CORE – 6		CREDIT - 4

Objective:
To enable the students, learn the basic concepts of Algorithms.

UNIT-I **[12Hrs]**
Divide and Conquer: Introduction to Algorithm- Complexity analysis- Divide and Conquer - Strassen's Matrix Multiplication-Quick sort-Merge sort- Binary Search-Finding Max and Min.

UNIT-II **[12Hrs]**
Dynamic Programming: General method-multistage graph-Traveling salesman problem

UNIT-III **[12Hrs]**
Basic Traversal and Search Technique: Depth first search- Breadth first search- Back Tracking- Graph colorings.

UNIT-IV **[12Hrs]**
Greedy method: General Method - Shortest path- 0/1 Knapsack problem

UNIT-V **[12Hrs]**
Np Hard and Np Complete Problem: Basic concepts of Np-Hard and Np-Complete.

Text Books:

1. E.Horowitz.S.Sahni and S.Rajasekaran- *Computer Alogrithms*- Glgotia Pub, Pvt.Ltd.,-1998.
2. Design and Analysis of Computer Algorithms by Alfred V. Aho
3. Introduction to Algorithms, Third Edition by Thomas H. Cormen

Reference Books:

1. G.Brassard and Brately -Fundamentals of Algorithm- PHI-1997.
2. Data Structures and Algorithm Analysis in C++ by Mark Allen Weiss, Pearson Education, Second Edition

YEAR – II	PRACTICAL - JAVA PROGRAMMING	CSP303S
SEMESTER– III		HRS/WK-3
CORE – Practical -3		CREDIT - 2

Objective:
To enable the students to learn the basic function of JAVA programming and to make students to acquire the skill in JAVA programming.

1. Finding area and Perimeter of a circle. Use Buffered Reader class.
2. Determining the order of numbers generated randomly using Random class.
3. Implementing and importing packages.
4. Implementing Interfaces-Arithmetic Manipulations
5. Exception Handling
6. Multithreading
7. String Manipulation using buffered Reader
8. Usage of Calendar Class and manipulation
9. Thread implementation using Synchronization
10. Application using File streams(Sequential File)

YEAR – II	COMPUTER GRAPHICS	CS408
SEMESTER– IV		HRS/WK-4
CORE – 7		CREDIT - 4

Objective:

- To enable the students to learn about the working of input output devices.
- To learn the concepts of 2D and 3D transformation models and generation algorithms.
- To understand computer graphic and various graphic algorithms.

UNIT –I [10 hrs]

Introduction to computer Graphics : Video display devices – Raster scan system – Random Scan System – Interactive input Devices – Hard copy devices – Graphics software – Output primitives – line drawing algorithms – initializing lines – Line function – circle Generating algorithms.

UNIT – II [10 hrs]

Output Primitives: Attributes of output Primitives – line attributes – Color and Grayscale style – Area filing algorithms – Character attributes Inquiry functions – Two dimensional transformations – Basic transformation – composite transformation – Matrix representation –Other transformations.

UNIT – III [10 hrs]

Two dimensional viewing: Two – dimensional viewing – window – to view port co-ordinate transformation – clipping algorithms – interactive input methods – Physical Input devices – logical classification of input devices – interactive picture construction methods.

UNIT- IV [15 hrs]

Three dimensional viewing : Three – dimensional concepts – Three dimensional display methods – parallel Projection –Perspective projection – Depth Cueing – Visible line and surface identification.

UNIT – V [15 hrs]

Three dimensional Transformations: Three dimensional transformations - Three dimensional viewing – Projection – Viewing transformations implementation of viewing operations.

Text Books:

1. D. Hearn and M.P. Basker – Computer Graphics [C Version] – Person Education.
2. Computer Graphics: Principles and Practice in C (2nd Edition) by James D. Foley, Andries van Dam, Steven K. Feiner, and John F. Hughes
3. Schaum's Outline of Computer Graphics by Zhigang Xiang and Roy A. Plastock
4. Introduction to Computer Graphics by James D. Foley, Andries van Dam, Steven K. Feiner, and John F. Hughes

Reference Books:

1. W.M. Newman and RF. Sproull – Principle of Interactive Computer Graphics – McGraw Hill International Edition -1979.
2. Interactive Computer Graphics: A Top-Down Approach Using OpenGL (5th Edition) by Edward Angel
3. Computer Graphics Using OpenGL (3rd Edition) by Francis S Hill Jr. and Stephen M Kelley

YEAR – II	ADVANCE JAVA PROGRAMMING	CS407T
SEMESTER– IV		HRS/WK-4
CORE - 8		CREDIT - 4

Objectives:

- This course provides an in-depth knowledge of Advanced Java language and programming.
- Implementing Java components
- Practicing RMI,BEAN and JDBC.

UNIT-I: [12Hrs]

Fundamentals of Applets : Introduction to Applets- Applet Architecture-Applet life cycle – Adding Applets to HTML file- getDocumentBase() & getCodeBase() –creating a simple applets- Loading and displaying images on applets.

UNIT-II: [12Hrs]

AWT & Managers: AWT controls –windows Fundamentals-working with graphics, fonts and colors- layout managers.

UNIT-III: [12Hrs]

JDBC: JDBC Architecture – Connecting to a Database (MSAcesss) – SQL commands- select, insert, delete, update. JDBC programming concept: classes-Connection class , Command class , ResultSet class.

UNIT-IV: [12Hrs]

NETWORKING: Networking Basics- Sockets - Inet Address - IP Address- Port number – TCP/IP Sockets – Net address .

UNIT-V: [12Hrs]

RMI AND BEANS: Introduction to RMI-RMI architecture - Example using RMI Introduction to java Beans-Properties of beans-Simple example using bean.

Text Books:

1. P. Naoughton and H. Schildt – "Java2: The Complete Reference" –TMH 1999, Ed. 3
2. K. Arnold and J. Gosling–"The Java Programming Language"–Ed.2,Publication 2000
3. Cays Horstmann and Gary Cornell – "Core Java Volume II" - Publications 2001
4. Phil Hanna – "JSP 2.0: The Complete Reference" – TMH., Edition 2, Publications 2003

Reference Books:

1. Ivan Bayross, "Java 2.0 Web enabled Commercial Application Development" – BPB Publications 2000.
2. Peter Norton & William Stack, "Guide to Java Programming", Techmedia Publications, New Delhi, First Edition, 1997.
3. Deitel & Deitel "JAVA: How to program", third edition Prentice Hall of India, 1999.

YEAR – II	SOFT SKILLS For the students admitted from the year 2013	AOSS401S
SEMESTER– IV		HRS/WK-4
PART IV		CREDIT – 4

Unit-I **[12Hrs]**

Group Discussion: Why Group Discussion is important- Types of Group Discussion-kTechniques in Group Discussion-Tips for Group Discussion.

Unit-II **[12Hrs]**

Interview Preparation- Common Interview Questions - Questions to Ask Your Employer- What Employers Want- Attitude & Effort - Body Language –Types of Interview: The Mock Interview- Phone Interviews- Behavioural Interviews- Closing the Interview-Thank You Notes & Follow-Ups.

Unit-III **[12Hrs]**

Quantitative Aptitude: Time and work -Time and Distance -Heights and Distances Data Interpretation: Tabulation – Bar Graphs – Pie Charts – Line Graphs.

Unit-IV: **[12Hrs]**

Logical Reasoning (1): Analogies –Arrangement-Causes and Effects -Family Tree-Puzzles based questions.

Unit V: **[12Hrs]**

Logical Reasoning (2): Sequence and Series -Code based questions on letters of alphabet-Syllogism-Statement and Conclusion.

References:

1. Group Discussion: A Practical Guide to Participation And Leadership by Kathryn Sue Young, Julia T. Wood, Gerald M. Phillips and Douglas J. Pedersen (Jun 25, 2006)

2. How To Interview Like A Pro: Forty-Three Rules For Getting Your Next Job Paperback – July 25, 2012-by JD Mary Greenwood (Author)

3. R.S. Aggarwal, Objective Arithmetic , S. Chand & Company, New Delhi , 2005

4. Govind Prasad Singh and Rakesh Kumar, Text Book of Quickest Mathematics

   (for all Competitive Examinations), Kiran Prakashan, 2012

5. R.S. Aggarwal, Quantitative Aptitude, S. Chand & Company, New Delhi, 2012

YEAR – II	PRACTICAL - ADVANCE JAVA PROGRAMMING	CSP404T
SEMESTER– IV		HRS/WK-3
CORE – Practical -4		CREDIT – 2

Objective:
To improve the programming skills of the students with respect to advance concepts of Java and to make the students to cop up with the latest programming concepts.

1. Loading image onto applet

2. Implement an application for Arithmetic operation using AWT.

3. Create a database for storing and manipulating student mark list using AWT.

4. Write a program to display the ip address of a given host machine.

5. Implement an application for sending a string from one machine to another using TCP/IP.

6. Implementing chatting application using TCP/IP.

7. Write a program to send in two values to the server program and get back the result calculated using RMI.

8. Incorporating circle symbol onto Bean box.

III B.Sc, (CS)	Relational Database Management System	CS509
SEMESTER – V		HRS/WK-6
CORE – 9		CREDIT - 5

Objective:
To make the students aware of all concepts related to Database.

Unit – I **[12 hrs]**
Database management system: Definition – purpose of database systems – data abstraction – data models – instances and schemes – data independence – database manager – database administrator – database users – overall system structure.

Unit II **[12 hrs]**
Entity Relationship Model: Entities and entity sets – relationships and relationship sets – attributes – mapping constraints – keys –E-R diagram – reducing E-R diagrams to tables – generalization – aggregation.

Unit – III **[12 hrs]**
Relational Model: the relational algebra – the tuple relational calculus – the domain relational calculus.

Unit – IV **[12 hrs]**
Normalization: First Normal Form – Second Normal Form – Third Normal Form – Boyce – Codd normal form - Fourth Normal Form.

Unit – V **[12 hrs]**
Oracle SQL: DDL,DML,DCL operations – integrity constraints – string functions – number functions – data arithmetic – selecting distinct values – working with null values – pseudo columns – grouping and ordering data – sub queries – joins – union ,intersect & minus – indexes – clusters – views – sequences – synonym – users, roles and privileges – grant and revoke permission – locks.

Text Books:

1. Henry F.Korth & Abraham Silberschatz "Database System concepts"- TMH-1998.
2. Albert Lulushi-Developing ORACLE FORMS Applications – PHI-1997.
3. A.J.Page "Relational database concepts selection and implementation"
4. George Koch & Kevin loney "Oracle the complete reference"
5. Oracle Developer 2000" by Ivan Bayross

Reference books:

1. C.J.Date , "An introduction to database system"
2. Jeffrey D.Ullman, "Principles of database system"
3. "Introduction to Oracle" ,Oracle Corporation Press.
4. "Introduction to PL/SQL",Oracle Corporation Press.

III B.Sc, (CS)	C SHARP .NET TECHNOLOGY	CS510
SEMESTER - V		HRS/WK-5
CORE – 10		CREDIT - 5

Objective:
To make the student get exposed with the latest programming concept Dot net and to equip them with skills related to c# programming.

UNIT-I **[12 hrs]**
Origin of Dot net Technology :- Dot Net framework overview – Major Components of Dot net Framework.

UNIT -II: **[12 hrs]**
Common Language Runtime(CLR): CLR activities for executing a program- Components of CLR- MSIC- JIT- Managed code –Dot net Languages- Benefits of Dot net approach- Anatomy of Dot net applications.

UNIT-III: **[12 hrs]**
Introducing C# and its features: Types of application in visual# - Visual Studio IDE – Variables, data types and Operators.

UNIT-IV: **[12 hrs]**
Control Structures: Control Structures (Branching and Looping) – Methods – Classes – Namespace –Properties – Interface.

UNIT –V: **[12 hrs]**
Windows forms: - Standard Controls – Overview of ADO .Net Objects – Creating new data Connection – Accessing data using Connection class, Command Class and Data Reader Class (OLEDB Connection).

Text Books:

1. Yashavant Kanetkar, 2004 C#.Net. Motilal Books of India.
2. Peter Drayton , Ben Albahari, Ted Neward. C# in an nutshell.O'Reilley Publication.
3. E.Balaguruswamy.Programming with C# - 1- Edition.Tata McGraw – Hill Publication.

Reference Books

1. Herbert Schildt. 2002 C# - A Biginner's Guide. Osborne/ McGraw – Hill Publication.
2. Burton Harvey,Simon Robinson,julian Templeman and Karli Waston,'C# Programming with the Public Bata',Shroff Pulisheres & Distributors Pvt.Ltd(SPD) Mumbai,April 2001.
3. Ben Albahart, Peter Drayton and Brad Merrill, 'c# Essenetials', SPD, Mumabi March 2001.

III B.Sc, (CS)	OPERATING SYSTEM	ECS511
SEMESTER - V		HRS/WK-6
Elective – I		CREDIT – 5

Objective:
This paper is intended to make the student aware of all concepts related to operating system.

UNIT-I **[12 hrs]**
Introduction to Operating System: Definition of Operating System- Booting – Kernel- History of Operating system - Operating system functions – File system.

UNIT-II **[12 hrs]**
Process Management and Deadlock: Process Management - Inter-process communication - Dead Lock - Dead Lock prerequisites - Dead Lock Strategies.

UNIT-III **[12 hrs]**
Memory Management: Memory Management - Single Contiguous – Fixed Partitioned – Variable Partitions – Non-Contiguous allocations - Paging – Segmentation - Virtual Memory Management Systems.

UNIT-IV **[12 hrs]**
GUI and Security: GUI – Components of GUI – Requirements of Windows based GUI – Security Protection: Threats – Attacks – Worms – Virus - Design principles – Authentication – Protection mechanisms – Encryption.

UNIT-V **[12 hrs]**
UNIX: Unix-Architecture of Unix-File System of Unix- Basic commands in UNIX.

Text Books:

1. A.S.Godbole-Operating Systems-TMH-1999.
2. A.Silberschatz and P.B.Galvin- Operating system concepts-Addision-Wesley Publishing company, Fifth Edition, 1998.

Reference Books :

1. Andrew S.Tannenbaum, “Operating Systems: Design and Implementation”, 3/e, PHI,2006.
2. Charles Crowley,”Opearting Systems-A design Oriented Approcah”,Tata MCGraw Hill , 1998.
3. William Stallings, “Operating Systems”,5/e PHI/Pearson Education , 1997.

III B.Sc, (CS)	CLOUD COMPUTING	ECS511A
SEMESTER - V		HRS/WK-6
Elective – I		CREDIT - 5

UNIT I – Fundamentals Of Grid And Cloud Computing **[12 hrs]**
Fundamentals – Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II – Developing Cloud Services **[12 hrs]**
Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT III – Cloud Computing For Everyone **[12 hrs]**
Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV – Using Cloud Services **[12 hrs]**
Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

UNIT V – Grid Computing **[12 hrs]**
OGSA – Sample Use Cases – OGSA Platform Components – OGSI – OGSA Basic Services. Globus Toolkit – Architecture – Programming Model – High Level Services – OGSI.Net. Middleware Solutions.

Text Book:
Michael Miller, Cloud Computing : Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCE BOOK :
Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

III B.Sc, (CS)	COMPUTER ARCHITECTURE	ECS512
SEMESTER - V		HRS/WK-5
Elective –II		CREDIT - 5

Objective:
Know and understand the main components of a computer system and the considerations in their design.

Unit-I **[12 hrs]**
Central Processing Unit: General Register and stack Organization-Instruction Formats-Addressing Modes-Data Transfer and Manipulation.

Unit-II **[12 hrs]**
Pipelining: Arithmetic, Instruction and RISC Pipelining-Vector Processing.

Unit –III **[12 hrs]**
Computer Arithmetic: Addition and Subtraction –Multiplication and division Algorithms – Floating Point and Decimal Arithmetic operations.

Unit- IV **[12 hrs]**
Input Output Organization: Peripheral Devices- I/O Interface - Asynchronous Data Transfer-Models of Transfer-Priority Interrupt – Direct Memory Access – I/O Processor.

Unit –V **[12 hrs]**
Memory Organization : Memory Hierarchy – Main Memory-Auxiliary Memory – Associative Cache and Virtual Memory.

Text Books:
1. M.M.Mano-Computer System Architecture -3rd Edition-PHI-1994
2. J.P.Haynes- Computer System Architecture-McGrawHill-1988
3. Computer Architecture: A Quantitative Approach, 4th Edition by John L. Hennessy and David A. Patterson

Reference Books :
1. Pal Chaudhary p, Computer Organization and Design, Prentice Hall of India , 2004.
2. Hayes J P , Computer Organization and Architecture , 2nd Edition , McGraw Hill, 1998.
3. Tanenbaum A S, Structured Computer Organization, 6th Edition, Prentice Hall, 2006.

III B.Sc, (CS)	E -COMMERCE	ECS512A
SEMESTER - V		HRS/WK-5
Elective –II		CREDIT - 5

Objective:

Almost all Business that is done in this world is electronically. This paper deals with all issues pertaining to the E-Commerce and equips the students with almost all technical issues regarding E-Commerce.

Unit-1 **[12 HRS]**

Electronic commerce environment and opportunities: Background – the electronic commerce environment - electronic marketplace technologies – models of electronic commerce:Overview – electronic data interchange – migration to open EDI – electronic commerce with WWW/Internet – Commerce Net Advocacy – Web commerce going forward.

Unit-2 **[12 HRS]**

Approaches to safe electronic commerce: Overview – secure transport protocols – secure transactions – secure electronic payment protocol(SEPP) – Secure electronic transaction(SET) – certificates for authentication – security on web servers and enterprise networks – electronic cash and electronic payment schemes: Internet monetary payment and security requirements – payment and purchase order process – on-line electronic cash.

Unit-3 **[12 HRS]**

Internet/Intranet security issues and solutions: The need for computer security – specific intruder approaches – security strategies – security tools – encryption – enterprise networking and access to the internet – antivirus programs – security teams.

Unit-4 **[12 HRS]**

MasterCard/visa secure electronic transaction: Introduction – business requirements – concepts – payment processing – E-mail and secure E-mail technologies for electronic commerce: Introduction – The means of distribution A Model for message handling – how does E-mail work? – MIME: Multipurpose internet mail extensions – S/MIME: Secure multipurpose internet mail extensions – MOSS: Message object. Security services – Comparisons of security methods – MIME and related facilities for EDI over the internet.

Unit-5 **[12 HRS]**

Internet and web site establishment: Introduction – technologies for web servers – internet tools relevant to commerce – internet applications for commerce – internet charges – internet access and architecture – searching the internet – internet resources: A travelogue of web malls: Introduction – a shopping experience – a travelogue – applications: Advertising on the internet: Issues and technologies: Introduction – advertising on the web – “Marketing 101” – creating a web site.

Text Books:

1. Daniel Minoli and Emma Minoli. 1999. *Web commerce technology handbook*. Tata Mc Graw Hill.

2. Kamalesh K Bajaj and Debjani Nag. 1999. E-Commerce, the cutting edge of business. TataMc Graw Hill.

3. Janice Reynolds. 2004. *The Complete E-Commerce Book*: *Design, Build & Maintain a Successful Web-based Business.* Focal Press Publication.

Reference Books:

1. Kenneth C. Laudon, Carol Guercio Traver. 2001. *E-commerce: Business, Technology, Society*. Addison Wesley Publication.

2. Constance H. McLaren, Bruce J. McLaren. 1999. *E-commerce: Business on the Internet South*. Western Educational Publication.

III B.Sc, (CS)	PRACTICAL - ORACLE	CSP505
SEMESTER – V		HRS/WK-3
CORE – 5		CREDIT - 2

Objective:

To make the student aware of the Back-End tool.

SQL

1. Simple Queries using DDL,DML and DCL
2. SQL Aggregate Functions
3. SET Operations
4. Views and Snapshots
5. Multiple Tables and Nested Queries

PL/SQL

6. PL/SQL Block
7. Function and Procedures
8. Subprograms and Packages
9. Triggers
10. Cursors

Forms and Reports

11. Designing Oracle Forms using Menus and Buttons
12. Developing Oracle Reports.

III B.Sc, (CS)	**PRACTICAL – C SHARP. NET Technology**	**CSP506**
SEMESTER - V		**HRS/WK-4**
CORE – 6		**CREDIT - 2**

Objective:

To improve the programming skills of the students with respect to C# and to make the students to know the latest programming concepts.

1. Create Custom Windows Forms in c# with images.
2. Create a Splash Screen.
3. Create a color chooser using standard control.
4. Notepad Application.
5. Login Form Creation using Ms Access
6. Database Application to store phone numbers along with your name [Ms Access – Backend]
7. Menu driven Application to store salary details of an employee[Ms Access - Backend]

III B.Sc, (CS)	DATA COMMUNICATION NETWORKS	CS613
SEMESTER - VI		HRS/WK-6
CORE –13		CREDIT - 5

Objective:
To enable the students to get acquainted with the basics of Networks and to make them concentrate on research side with respect to networks.

Unit I **[12 hrs]**
Networks : protocols and standard – line configuration – topology – transmission mode – categories of networks – inter networks.

Unit II **[12 hrs]**
The OSI Model : functions of the layers – TCP/IP protocol suite – signals – analog and digital signal – periodic and a periodic signals – analog signals – digital signal – data transmission – data terminal equipment – data circuit terminals equipment – modems.

Unit III **[12 hrs]**
Transmission Media: guided media – unguided media – transmission impairments – media comparison. Multiplexing – FDM – TDM – WDM. Error detection and correction – types of errors–detection – vertical redundancy check (VRC) – longitudinal redundancy check (LRC) – cyclic redundancy check (CRC) – check sum – error correction.

Unit IV **[12 hrs]**
Switching: Circuit switching – packet switching – message switching – networking and internetworking devices – repeaters – bridges – routers – gateways.

Unit V **[12 hrs]**
Routing algorithms: distance vector routing – link state routing – data link control – line discipline – flow control – error control.

Text Books:
1. "Data Communications and Networks" – Behrouz A Forouzan, Second Edition, Tata McGraw Hill, 2002.
2. "Data and Computer Communication", William Stallings, 7th Edition, Pearson Education – 2006.
3. Introduction to Data Communications and Networking by Wayne Tomasi

Reference Books:
1. William Stallings, "Data & Computer Communications", Sixth Edition,Pearson Education, 2001.
2. Introduction to Data Communications and Networking by Behrouz Forouzan, Catherine Ann Coombs, and Sophia Chung Fegan.
3. Fred Halsall, "Data Communications,Computer Networks and Open Systems", Addison Wessley, 1995.

III B.Sc, (CS)	ASP. NET TECHNOLOGY	CS614
SEMESTER - VI		HRS/WK-5
Core - 14		CREDIT - 5

Objective:
To enable the students to have a depth knowledge in Dot net technology.

UNIT I: [10 hrs]
Introduction to ASP.NET: Architecture of ASP.NET – difference between asp and ASP.NET .

UNIT II: [20 hrs]
Creating and running a simple web-form: Examining an ASPX file, Examining a code –behind file, Relation between ASPX file and code behind file, how to code in an ASP.NET, Building an ASPNET web application.

UNIT III: [15 hrs]
Web controls in ASP.NET: Text and Graphics Controls, AdRotator Control, Validation Controls.

UNIT IV: [15 hrs]
Introduction to ADO.net : Connection class – DataReader class – Command class. A complete example.

UNIT V: [15 hrs]
Disconnected architecture in ADO.net : Key components of ADO.net disconnected – DataSet class– DataAdapter class – Working with data grids in ASP.NET - with ADO.net

Text Books:

1. Harvey M.Deitel and Paul J.Deitel-C# programmers-Second Edition.
2. Chris Ullman, John Kauffman – Beginning ASP.NET 1.1 with VB.NET 2003- Wrox Publication.
3. Alex Homer, Dave Sussman – Professional ASP.NET 1.1 – Wrox Publication.

Reference Books:

1. Crouch – ASP.NET and VB.NET web programming – Pearson Education.
2. Greg Buczek – ASP.NET Developer's Guide – Tata McGraw Hill 2002.
3. Deitel and Deitel – Internet & World wide web how to program – PHI, 2003.

III B.Sc, (CS)	SOFTWARE ENGINEERING	ECS615S
SEMESTER – VI		HRS/WK-6
Elective – I		CREDIT - 5

Objective:
To introduce the concepts of software Engineering and the various phases in Software development in order to equip the students in developing project.

Unit - I: **[12 hrs]**
Software Engineering and Models: Introduction -Characteristics of Software-Software Myths-**Process Models**: The Waterfall Model- Incremental Process Models: The Incremental Model ,The RAD Model - **Evolutionary Process Models** : Prototyping ,The Spiral Model ,The Concurrent Development Model.

Unit –II : **[12 hrs]**
Requirement Engineering: Requirement Engineering Tasks - Initiating the Requirements Engineering Process- Eliciting Requirements.

Unit III: **[12 hrs]**
Building Analysis Model: Requirement Analysis - Data Modeling – Flow Oriented Modeling – Class Based Modeling – Creating a Behavioral Model.

Unit –IV: **[12 hrs]**
Testing: **Testing strategies**: Test Strategies For Conventional Software- Validation Testing – System Testing –White Box Testing – Basic Path- Control Structure – Black Box Testing.

Unit –V: **[12 hrs]**
Project Management: The Management Spectrum- The People – The Product, The Process - Formal Technical Reviews.

Text Books:
1. R.S.Pressman – Software Engineering –Sixth Edition McGraw Hill International edition – 2005.

Reference Books:

1. Richard Fairley – Software Engineering – (Design,Reliability and Management) – Tata McGraw Hill edition –1983.
2. Software Engineering: (Update) (8th Edition) by Ian Sommerville

III B.Sc (CS)	MANAGEMENT INFORMATION SYSTEM	ECS615A
SEMESTER - VI		HRS/WK-6
Elective - I		CREDIT - 5

UNIT I: [20 hrs]

Introduction to information systems(IS): why study IS- why business need information technology (IT) – fundamentals of IS concepts – overview of IS – solving business problems with IS – developing IS solutions.

UNIT I: [20 hrs]

Information systems for business operations: Business IS – marketing, manufacturing, human resource, accounting and financial information systems – transaction processing system – management information and decision support systems.

UNIT III: [20 hrs]

Managing information technology: Managing information resource and technologies – global IT management – planning and implementing business change with IT.

UNIT IV: [15 hrs]

Enterprise Resource Planning (ERP): an overview – benefits of ERP – ERP and related technologies – business process reengineering – data warehousing – data mining – online analytical processing – supply chain management.

UNIT V: [15 hrs]

ERP implementation: ERP implementation life cycle – implementation methodology – hidden cost – organizing the implementation – vendors, consultants and users contracts with vendors, consultants and employees project management and monitoring – ERP present and future – turbo change the ERP systems – enterprise integration applications – ERP and E-commerce – ERP and Internet.

Text Book

1.James A O'Brien – Management Information Systems for managing IT in the internetworked Enterprise – 4th Edition, Tata McGraw Hill, New Delhi, 1999.

Reference Books

1.Alexis Leon – ERP Demystified – Tata McGraw Hill, New Delhi, 2000.
2.W.S. Jaswadekar – Management Information Systems – Tat McGraw Hill, New Delhi, 1998.

III B.Sc, (CS)	INTERNET PROGRAMMING For the students admitted from the year 2013	ECS616S
SEMESTER - VI		HRS/WK-5
Elective II		CREDIT – 5

Objective:
To enable the students to learn the principles of Internet programming.

UNIT -I: **[12 hrs]**
Internal Concepts: Internet Services – Types of accounts - Media for internet – ISP – TCP/IP and Connection software – Dial-up Networking –setting up and Internet Connection – Testing connection – Disconnecting from the Internet .

UNIT -II : **[12 hrs]**
Contenders: Issues in high-speed Connection – Connecting via ISDN, ASDN and cable Modem – Intranets – Components of an Intranet – steps for creating Intranet – Maintenance – Connecting LAN to Internet .

UNIT- III: **[12 hrs]**
E-mails: Downloading E-Mails – Signatures and Stationery – Web based E-Mail – E-mail task – Outlook Express – Sending and Receiving Files using Eudora – Outlook Express and Pine – Multiple e-Mail Accounts – Sending form Letters – Formatting E-mail – E-mail mailing List.

UNIT IV **[12 hrs]**

Internet Basics: Introduction to HTML – List – Creating Table – Linking Document Frames – Graphics to HTML Doc.

UNIT V **[12 hrs]**

Java Script: Introduction – Advantage of JAVA Script - JAVA Script Syntax – Data type – Variable – Array – Operator and Expressions – Looping Constructor – Function – Dialog Box.

TEXT BOOKS:

1. Internet – Margaret Levine Young – The Complete Reference – Millennium Edition – TMH Edition –1999 .
2. The Internet For Dummies by John R. Levine, Margaret Levine Young, and Carol Baroudi
3. The Everyday Internet All-in-One Desk Reference for Dummies (For Dummies (Computer/Tech)) by Peter Weverka
4. How the Internet Works (8th Edition) by Preston Gralla
   Harley Hahn , The Internet – Complete Reference – Second Edition – TMH Edition
5. Bayross, Web Enable Commercial Application Development Using HTML, DHTML, Java Script, Pen CGI,BPB Publications, 2000.

Reference Books:

1. Harley Hahn , The Internet – Complete Reference – Second Edition – TMH Edition .

2. The Everyday Internet All-in-One Desk Reference For Dummies (For Dummies (Computer/Tech)) by Peter Weverka
3. T.A.Powell, Complete Reference HTML (Third Edition), TMH, 2002.

III B.Sc, (CS)	MULTIMEDIA	ECS616A
SEMESTER - VI		HRS/WK-5
Elective II		CREDIT - 5

Objectives:

- To enable the students to learn the concepts of Multimedia.

UNIT - I: [10 Hrs]

WHAT IS MULTIMEDIA: Definitions – Where to use multimedia – Introduction to Making Multimedia: What you need – Macintosh and Windows production platforms.

TEXT: The power of meaning – About fonts and faces – Using text in multimedia – Computers and Text – Font editing and Design tools – Hypermedia and Hypertext.

UNIT - II: [13 Hrs]

SOUND: The power of sound – Multimedia system sounds – MIDI versus Digital Audio – Digital Audio – Making MIDI audio – Audio, File formats – Working with sound on the Macintosh – Notation Interchange File Format (NIFF) – Adding sound to your multimedia project. **IMAGES**: Making still Images – Color – Image file formats.

UNIT - III: [12 Hrs]

ANIMATION: The Power of Motion – Principles of Animation – Making animations that works.

VIDEO: Using Video – How Video works – Broadcast video standards – Integrating computers and television – Shooting and Editing Video – Video tips – Recording formats – Digital Video.

UNIT - IV: [13 Hrs]

PLANNING AND COSTING: Project planning – Estimating – RFPs and Bid Proposals - Designing – Producing.

MULTIMEDIA PACKAGES: Cool3d, Photoshop, Sound forge, Windows Movie maker, Flash- a Simple Project for Multimedia using the Multimedia Packages.

UNIT - V: [12 Hrs]

INTRODUCTION TO VIRTUAL REALITY: Introduction to virtual reality – goals of virtual reality- Issues in Virtual Reality- Introduction to VRML.

Text Books:

1. Tay Vaughan – "Multimedia Making it Work" - McGraw Hill, 1994.
2. John Hayward – Adventures in Virtual Reality, One Publications

Reference Book(s):

1. Jeffcoate, Judith – "Multimedia in Practice" - Prentice Hall, 2001.

III B.Sc, (CS)	PRACTICAL - ASP. NET Technology	CSP607
SEMESTER - VI		HRS/WK-5
CORE – Practical		CREDIT – 2

Objective:

To enable the student to build applications in ASP.NET (C#)

1. Create a Student Bio-data
2. Create login form
3. Implement chatting application
4. Create an application for sending a request from one page to another using validation controls.
5. Implement Telephone application [MS Access]
6. Implement Electricity application [MS Access]
7. Create an application for storing student information such as Register number, Name, Class and Department and display it using Data Grid. [MS Access].

III B.Sc, (CS)	PRACTICAL – INTERNET PROGRAMMING For the students admitted from the year 2013	CSP608
SEMESTER – VI		HRS/WK-3
Elective – Practical		CREDIT – 2

1. Design a simple web page in html using formatting tags to display your address at the center of the screen.
2. Display you're like things and dislike things using Html list.
3. Display an image in html with comments.
4. Design a web page using anchor tag to display about the important persons in India.
5. Use html Frames to divide the screen and load few web pages in a screen.
6. Use html Forms to design your Bio-data.
7. Design menus in Html.
8. Design simple Calculator using Java Scripts.
9. Use functions in Java script.
10. Use strings in Java Script.

THEORY EXAMINATION

Continuous Internal Assessment (CIA) 25 marks

Two Internal Examinations	15 marks
Assignment / Seminar	5 marks
Attendance	5 marks
Total	**25 marks**

External Examination (75 marks)

Question Pattern

B. Sc. Computer Science

Time: 3 Hrs Max. Marks: 75

Section – A (5 x 5 = 25)
Answer ANY FIVE out of eight.

One question from each unit and three questions from important topics with problems and programs

Section – B (5 x 10 = 50)
Answer ANY FIVE out of EIGHT.

One question from each unit and three questions from important topics with problems and programs

PRACTICAL EXAMINATION

Continuous Internal Assessment (CIA) (40 marks)
Based on the periodical evaluation of record and experiments assessed by the staff in charge

External Examination (60 marks)

Total Marks: 60
Time: 3 Hrs

Program	- 50 marks
Record	- 10 marks
Total	- 60 marks