

# **SADAKATHULLAH APPA COLLEGE**

**(AUTONOMOUS)**

**(Reaccredited by NAAC at an 'A' Grade with a CGPA of 3.40 out of 4.00 in the III cycle An ISO 9001:2008 Certified Institution)**

**RAHMATH NAGAR, TIRUNELVELI- 11.**

**Tamilnadu**

## **PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE (Unaided)**



### **CBCS SYLLABUS**

**For**

### **M.Sc. Computer Science**

**(Applicable for students admitted in June 2015 and onwards)**

**(As per the Resolutions of the Academic Council  
Meeting held on 23.02.2016)**



## CONTENTS

<b>Sl. No.</b>	<b>Subject Title</b>	<b>Subject Code</b>	<b>Page No.</b>
1	Course Structure	-	1
2	List of Non-major Elective Courses	-	4
3	Design and Analysis of Algorithm	15PCSC11	5
4	Advanced Database Management System	15PCSC12	6
5	Advanced Java Programming	15PCSC13	7
6	Advanced Networking Concepts	15PCSC14	8
7	Computer Science Core Practical - I	15PCSC2P1	9
8	Android and Applications Development	15PCSC21	10
9	Software Project Management	15PCSC22	12
10	Web Programming I	15PCSC23	14
11	Data Mining and Data Warehousing	15PCSC24	16
12	Computer Science Core Practical - II	15PCSC2P2	18
13	Mobile Computing	15PCSC31	19
14	Principles of Compiler Design	15PCSC32	21
15	Web Programming II	15PCSC33	23
16	Computer Science Core Practical - III	15PCSC4P1	25
17	Cloud Computing	15PCSC41	26
18	Soft Computing	15PCSC42	28
19	Project	15PCSP41	30
20	Computer Science Core Practical - IV	15PCSC4P2	31
21	Digital Image Processing	15PCSE4A	32
22	OOAD and UML	15PCSE4B	33
23	Internet Concepts and Web Design	15PCSN31	34
24	Scheme of Examinations	-	35



## M.Sc. COMPUTER SCIENCE

### Course Structure (CBCS)

I Semester			II Semester		
Course	H/W	C	Course	H/W	C
Core 1	6	4	Core 5	6	4
Core 2	6	5	Core 6	6	5
Core 3	6	5	Core 7	6	5
Core 4	6	5	Core 8	6	5
Core Practical – I *	6	–	Core Practical-I	–	3
			Core Practical – II	6	3
<b>Total</b>	<b>30</b>	<b>19</b>	<b>Total</b>	<b>30</b>	<b>25</b>
III Semester			IV Semester		
Core 9	6	5	Core 12	6	5
Core 10	6	5	Core 13	6	5
Core 11	6	5	Core 14 – Project	6	5
Core Practical – III *	6	–	Core Practical – III*	–	3
Non Major Elective	6	5	Core Practical – IV*	6	3
			Core Elective	6	5
<b>Total</b>	<b>30</b>	<b>20</b>	<b>Total</b>	<b>30</b>	<b>26</b>

\* Examination at the end of Even semester

### Distribution of Hours, Credits, No. of Papers, & Marks

Subject	Hours	Credits	No of papers	Marks
Core + practical	108	80	14 + 4	1800
Major Elective	6	5	1	100
Non Major Elective	6	5	1	100
<b>Total</b>	<b>120</b>	<b>90</b>	<b>20</b>	<b>2000</b>

**DEPARTMENT OF COMPUTER SCIENCE (PG)**

**CBCS SYLLABUS – M.Sc. Computer Science**

SEM	P	Title of the paper	S. Code	H/W	C	Marks		
						I	E	T
I	C1	Design and Analysis of Algorithm	15PCSC11	6	4	25	75	100
	C2	Advanced Database Management System	15PCSC12	6	5	25	75	100
	C3	Advanced Java Programming	15PCSC13	6	5	25	75	100
	C4	Advanced Networking Concepts	15PCSC14	6	5	25	75	100
	CP1	Core Practical – I (Advanced Java Programming Lab)	-	6	-	Examination II Semester		
II	C5	Android and Applications Development	15PCSC21	6	4	25	75	100
	C6	Software Project Management	15PCSC22	6	5	25	75	100
	C7	Web Programming I	15PCSC23	6	5	25	75	100
	C8	Data Mining and Data Warehousing	15PCSC24	6	5	25	75	100
	CP1	Core Practical – I (Advanced Java Programming Lab)	15PCSC2P1	-	3	40	60	100
	CP2	Core Practical – II (Web Programming I Lab)	15PCSC2P2	6	3	40	60	100
III	C9	Mobile Computing	15PCSC31	6	5	25	75	100
	C10	Principles of Compiler Design	15PCSC32	6	5	25	75	100
	C11	Web Programming II	15PCSC33	6	5	25	75	100
	CP3	Core Practical – III (Web Programming II Lab)	-	6	-	Examination IV Semester		
	E(NM)	Choose from the List	-	6	5	25	75	100
IV	C12	Cloud Computing	15PCSC41	6	5	25	75	100
	C13	Soft Computing	15PCSC42	6	5	25	75	100
	C14	Project	15PCSP41	6	5	-	100	100
	CP3	Core Practical – III * (Web Programming II Lab)	15PCSC4P1	-	3	40	60	100
	CP4	Core Practical – IV * (Image Processing Lab)	15PCSC4P2	6	3	40	60	100
	E(M)	A) Digital Image Processing	15PCSE4A	6	5	40	60	100
		B) OOAD and UML	15PCSE4B					
			<b>Total</b>	<b>120</b>	<b>90</b>	<b>535</b>	<b>1465</b>	<b>2000</b>

**DEPARTMENT OF COMPUTER SCIENCE (PG)**

**Non-Major Elective Course offered to Other Major PG Students**

<b>SEM</b>	<b>P</b>	<b>Title of the paper</b>	<b>S. Code</b>	<b>H/W</b>	<b>C</b>	<b>Marks</b>		
						<b>I</b>	<b>E</b>	<b>T</b>
I	E(NM)	Internet Concepts and Web Design	15PCSN31	6	5	25	75	100
			<b>Total</b>	<b>6</b>	<b>5</b>	<b>25</b>	<b>75</b>	<b>100</b>

**LIST OF NON-MAJOR ELECTIVE COURSES OFFERED TO PG  
STUDENTS BY VARIOUS DEPARTMENTS**

SEM	TITLE OF THE PAPER	S.CODE	H/W	C	MARKS		
					I	E	T
<b>DEPT. OF ENGLISH (PG)</b>							
III	English For Business Communication	15PENN31	6	5	25	75	100
<b>DEPT. OF COMPUTER SCIENCE (PG)</b>							
III	Internet Concepts and Web Design	15PCSN31	6	5	25	75	100
<b>DEPT. OF MATHEMATICS (PG)</b>							
III	Basics in Mathematics	15PMAN31	6	5	25	75	100
<b>DEPT. OF PHYSICS (PG)</b>							
III	Renewable Energy Sources	15PPHN31	6	5	25	75	100



<b>I SEMESTER</b>			
<b>C 1</b>	<b>DESIGN AND ANALYSIS OF ALGORITHM</b>		<b>15PCSC11</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 4</b>

### **UNIT-I : MATHEMATICS REVIEW**

Mathematics Review, background model – Algorithm analysis – running time calculations – General rules – Solutions for the maximum subsequence sum problem – Logarithms in the running time – checking analysis.

### **UNIT-II : ABSTRACT DATA TYPE (ADT)**

Abstract Data Type (ADT) – List ADT – Array implementation of lists – Linked List – Doubly and circularly linked lists – Stack ADT – Queue ADT – Trees: Binary trees – Binary search trees.

### **UNIT-III : HASHING**

Hash function – open Hashing – Closed Hashing – Priority Queues (Heaps): Binary Heap – Applications of priority queues  
Sorting: Insertion Sort – Shell Sort – Heapsort – Mergesort – Quicksort.

### **UNIT-IV : GRAPH ALGORITHMS**

Topological sort – Shortest Path algorithms – Network Flow Problems – Minimum Spanning tree – Application of DFS.

### **UNIT-V : ALGORITHM DESIGN TECHNIQUES**

Algorithm Design Techniques – Greedy Algorithms: Scheduling problem – Huffman codes – Approximate bin packing – Divide and Conquer : Running time of Divide and Conquer algorithms – Closest – Points problem – The selection problem – Theoretical Improvements for Arithmetic Problems.

### **TEXT BOOKS:**

1. Data Structures and Algorithms Analysis in C++ - Mark Allen Weiss: Pearson Education Asia
2. Data Structures, Algorithms and Applications in C++ - Sahni : McGraw Hill Publication.

## **I SEMESTER**

**C 2                    ADVANCED DATABASE MANAGEMENT SYSTEM                    15PCSC12**

**Hrs / Week : 6            Hrs / Sem : 90            Hrs / Unit : 18                    Credits : 5**

### **UNIT-I : RELATIONAL MODEL**

Introduction - Structure of Relational Data Base - Relational Algebra - Relational Calculus. Relational Query Languages - Introduction - Codd's Rules - Structured Query Language - Embedded Structured Query Language. ER Model - Basic Concepts - Conversion of ER Model into Relations - ER Diagram Symbols.

### **UNIT-II : DATA BASE DESIGN**

Introduction - Software Development Life Cycle - Database Development Life Cycle - Automated Design Tools. Functional Dependency and Decomposition - Functional Dependency - Decomposition. Normalization - Introduction - Normalization - Normal Forms - BCNF - 4 NF - 5 NF.

### **UNIT-III : QUERY PROCESSING AND OPTIMIZATION**

Introduction - Query Processing - Syntax Analyzer - Query Decomposition - Query Optimization. Transaction Processing and Concurrency Control: Transaction Concepts - Concurrency Control - Locking Methods - Timestamp Methods - Optimistic Methods.

### **UNIT-IV : DATA BASE RECOVERY SYSTEMS**

Introduction - Recovery Concepts - Types of Failures - Types of Recovery - Recovery Techniques - Buffer Management. Data Base Security: Goals - Firewalls - Data Encryption.

### **UNIT-V : DISTRIBUTED DATA BASE SYSTEMS**

Introduction - Distributed Data Bases - Architecture of Distributed Data Bases - Distributed Data Base System Design - Distributed Query Processing. Emerging Data Base Technologies: Internet Data Bases - Digital Libraries - Multimedia Data Bases - Mobile Data Bases - Spatial Data Bases.

### **TEXT BOOKS:**

1. S.K. Singh, "Database Systems Concepts, Design and Applications", Pearson Education Pte. Ltd., New Delhi: 2006.
2. C.J. Date and others, "An Introduction to Database Systems", Eighth Edition, Pearson Education Pte. Ltd., New Delhi: 2006.

### **REFERENCE BOOKS:**

1. Abraham Silberschatz, "Database Systems", McGraw Hill International, 1997.
2. Paneerselvam R, "Database management systems", PHI, 2005.
3. Narang Rajesh, "Database management systems", PHI, 2005.
4. ISRD Group, "Introduction to database management systems", TMG, 2006.
5. Ramakrishnan, Gehrke, "Database management systems", 3/E, TMG, 2003.

<b>I SEMESTER</b>			
<b>C 3</b>	<b>ADVANCED JAVA PROGRAMMING</b>		<b>15PCSC13</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT-I : APPLET AND SWING**

Introduction to Applet and swing – Creating Applet in Java, Identifying various stages of an Applet life Cycle, Graphics method in Java , the AWT control Components, Layout Manager ,A Tour of Swing.

### **UNIT-II : JDBC**

Understanding JDBC Programming Basics : Setting up your first JDBC Query - Connecting to Databases with JDBC - Building JDBC Statements – Working with Resultsets – Understanding JDBC Datatypes.

### **UNIT-III : SERVLET**

Background – The Life cycle of a Servlet – A Simple Servlet – The Servlet API – The javax.servlet Package – Reading Servlet Parameters – The javax.servlet.http Package – Handling HTTP Requests and Responses – Cookies – Session Tracking.

### **UNIT-IV : RMI & BEANS**

Overview of Java RMI - A Simple Client/Server applications using RMI - Introduction to Bean- Advantages of Java Bean- Application Builder Tools – BDK - JAR files – Introspection - Developing Simple Bean – Using Bound Properties – Using the BeanInfo Interface – Constrained Properties - Persistence – Customizers –Java Beans API.

### **UNIT-V : JSP**

Introduction – What and Why use JSP – JSP Overview : The Problem with Servlets – The anatomy of a JSP Page – JSP Processing - JSP Application Development : Generating Dynamic Content – Building Web application with Java Server pages and Servlets.

### **TEXT BOOKS:**

1. Unit I,III & IV: Herbert Schildt, Java 2 complete Reference, Tata McGraw Hill.
2. Unit II : Todd M. Thomas, Java Data Access, M&T Books.
3. Unit V: Hans Bergsten, “Java Server Pages”, SPD O’Reilly.

### **REFERENCE BOOKS:**

1. Ken Arnold, Crosling Homles, “The Java Programming Language” Pearson Education III Edition.
2. Harley Hahn, The Internet – Complete Reference , Tata McGraw Hill 1997.
3. Advance Java Programming – AmitK.Mishra.
4. Black Book- Java Programing \_Dreamtech.

<b>I SEMESTER</b>			
<b>C4</b>	<b>ADVANCED NETWORKING CONCEPTS</b>		<b>15PCSC14</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT-I : HIGH SPEED NETWORKS**

Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories – AAL, High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fiber Channel – Wireless LANs: applications, requirements – Architecture of 802.1.

### **UNIT-II : CONGESTION AND TRAFFIC MANAGEMENT**

Queuing Analysis- Queuing Models – Single Server Queues – Effects of Congestion –Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

### **UNIT-III : TCP AND ATM CONGESTION CONTROL**

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management –Exponential RTO back off – KARN’s Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes –Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management.

### **UNIT-IV : INTEGRATED AND DIFFERENTIATED SERVICES**

Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services

### **UNIT-V : PROTOCOLS FOR QOS SUPPORT**

RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms –Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP –Protocol Architecture, Data Transfer Protocol, RTCP.

#### **TEXT BOOK:**

William Stallings, “HIGH SPEED NETWORKS AND INTERNET”, Pearson Education, Second Edition, 2008.

#### **REFERENCES:**

1. Warland, Pravin Varaiya, “High performance communication networks”, Second Edition, Jean Harcourt Asia Pvt. Ltd., 2001.
2. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”, Cisco Press, Volume 1 and 2, 2003.
3. Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band Telecommunication Networks”, CRC Press, New York, 2004.

<b>I SEMESTER</b>		
<b>CP 1</b>	<b>CORE PRACTICAL - I (Exam end of II Sem.)</b>	<b>15PCSC2P1</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Credits : 3</b>

**CORE PRACTICAL - I \* (Advanced Java Programming Lab)**

1. Program using Applet
2. Program using Swing
3. Developing applications using JDBC
4. Program using Servlet
5. Programs using RMI
6. Implementation of Java Bean
7. Programs using JSP

<b>II SEMESTER</b>			
<b>C 5</b>	<b>ANDROID AND APPLICATIONS DEVELOPMENT</b>		<b>15PCSC21</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 4</b>

### **UNIT-I : INTRODUCTION TO ANDROID**

What is Android – Advantages of Android – Preparing of Liftoff: Java – Eclipse – Android – SDK. – Android Development Environment: Installing Java, Eclipse and Android – updating the Android SDK: Setting up AVDs and Smart Phone Connections – Developing on 64 Bit Computing Platforms

### **UNIT-II : ANDROID SOFTWARE DEVELOPMENT PLATFORM**

Introducing the Android Software Development Platform: Understanding Java SE and the Dalvik Virtual Machine – The directory Structure – Android XML and Android Application Resources – Launching Application: Android Manifest.XML – Creating your first Android Application – Android Frame work Overview – Foundation of OOPS – Overview of XML – The APK File – Android Application Components – Android Intent Objects – Android Manifest XML

### **UNIT-III : SCREEN LAYOUTS DESIGN**

Views and Layouts – Android view Hierarchical – Defining Screen Layouts using XML – UI Design: Buttons, Menus, Dialogs – Using Common UI Elements – Using Menus in Android – Adding Dialogs

### **UNIT-IV : GRAPHIC RESOURCES IN ANDROID**

An Introduction to Graphic Resources in Android: Introducing the Drawables – Using Bitmap Images in Android – Creating Animation in Android – Using Transitions – Creating 9-Patch Customs Scalable Images – Playing Video in your Android Apps - Adding Interactivity: Handling UI events - An overview of UI events in Android

– Handling Onclick events, Ontouch, Onlong click, Context Menus in Android: Oncreate Context Menu

### **UNIT-V : DATA STORAGE IN ANDROID**

In understanding content providers: An overview of Android Content Providers – Defining a Content Providers – Working with a Database – Understanding Intents and Intent Filters – What is an Intent – Android Intent Messaging via Intent Objects – Intent Resolution: Implicit Intents and Explicit Intents – Using Intents with Activities – Android Services – The Future: Widgets – Location Basis Services in Android – Google Maps in Android – Google Search in Android – Data Storage in Android – Device Administration: Security for IT – Using the Android Camera Class to Control a Camera – 3D Graphics – Face Detector – Sound Pool – Media Recorder

### **TEXT BOOK :**

Android Apps for Absolute Beginners 2<sup>nd</sup> Edition by Wallace Jackson, Apress

### **REFERENCE BOOKS :**

1. Professional Android Open Accessory Programming with Arduino by Andreas Goransson, David Cuartielles Ruiz
2. Enterprise Android Programming Android Database Application for the Enterprise by Zigurd Mednieks, G.BlakeMeike, Laird Dornin, Zane Pan

<b>II SEMESTER</b>			
<b>C6</b>	<b>SOFTWARE PROJECT MANAGEMENT</b>		<b>15PCSC22</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

**UNIT-I : INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT (SPM)**

Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization. An Overview of Project Planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

**UNIT-II : PROJECT EVALUATION & ESTIMATION**

Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report: Choosing technologies, choice of process model, structured methods, rapid application development, water fall, V-process, spiralmodels. Prototyping, incremental delivery. Effort Estimation: Albrecht function point analysis.

**UNIT-III : ACTIVITY PLANNING & RISK MANAGEMENT**

Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity float, shortening project , precedence networks. Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values.



#### **UNIT-IV : RESOURCE ALLOCATION & MONITORING THE CONTROL**

Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence. Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

#### **UNIT-V : MANAGING CONTRACTS AND SOFTWARE QUALITY**

Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, software quality : Introduction, The place of software quality in project planning, The importance of software quality, Defining software quality, Product and Process Metrics, Product vs Process quality management, Techniques to Enhance software quality, Testing

##### **Text Book:**

1. Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

##### **Reference Books:**

1. Software Engineering – A Practitioner’s approach, Roger S. Pressman (5th edi), 2001, MGH
2. Software Project Management, Walker Royce, 1998, Addison Wesley.
3. Project Management 2/c. Maylor
4. Managing Global software Projects, Ramesh, 2001, TMH.

<b>II SEMESTER</b>			
<b>C 7</b>	<b>WEB PROGRAMMING I</b>		<b>15PCSC23</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT -I : INTRODUCTION TO PHP**

What, Why and Evolution of PHP?, Installing PHP, Create PHP Script, Running PHP Script. PHP Language Basics: Variables, Data Types, Operators & Expressions, Constants. Decision and Loops: Making Decisions, Doing repetitive tasks with looping .String: Creating & Accessing String, String Manipulation using string functions.

### **UNIT-II : ARRAYS, FUNCTIONS, CLASSES AND OBJECTS**

Arrays : Anatomy of an Array, Creating Arrays, Accessing Array Elements, Looping through Array, Multidimensional Array, and Manipulating Array using array functions. Functions: What and why function, Calling Function, Variable Function, User-Defined Function, Working with references, Recursive Function. Classes and Objects: Creating Class and Object, Create and using properties & methods, Overloading, Constructor, Destructor, Object Inheritance.

### **UNIT-III : PHP WITH MYSQL**

Handling FORM with PHP: Capturing form Data with PHP, Dealing with Multi-value Fields, Generating Web Forms, Storing Variable in Forms, Working with Multipage Forms, Creating File Upload Forms, Redirecting form submission. Preserving State in PHP: Saving State with Query String, Working with cookies, PHP Session to store data. Database Connectivity & SQL : Deciding how to store data, Understanding relational databases, Setting Up MySQL, Connecting to MySQL from PHP, Retrieving Data from MySQL (Select), Manipulating MySQL Data with PHP (insertion, updation and deletion).

#### **UNIT-IV : INTRODUCTION TO PYTHON**

The way of the program, Variables, Expressions and Statements, Functions, Conditionals and recursions, Fruitful Functions, Iterations, Strings, Lists, Dictionaries, Tuples and Files.

#### **UNIT-V : OBJECT ORIENTED PROGRAMMING WITH PYTHON**

Classes and Objects, Classes and Functions, Classes and Methods, Inheritance.

#### **TEXT BOOKS:**

1. BEGINNING PHP 5.3 by MATT DOYLE WROX publication
2. Think Python How to Think Like a Computer Scientist by Allen B. Downey, O'Reilly publications

#### **REFERENCE BOOKS :**

1. Head First Python Paul Barry O'Reilly publications
2. PHP 5 Power Programming Andi Gutmans, Stig Saether Bakken and Derick Rethans

<b>II SEMESTER</b>			
<b>C8</b>	<b>DATA MINING AND DATA WAREHOUSING</b>		<b>15PCSC24</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT-I : DATA MINING**

Introduction : Data mining – Data mining functionalities – kinds of patterns can be mined – classification – major issues. Data warehouse – A multidimensional data model – Data warehouse architecture – Data warehouse implementation – From data warehouse to data mining.

### **UNIT-II : DATA PROCESSING**

Data preprocessing – Data cleaning – Data Integration and Transformation – Data Reduction – Discretization and concept hierarchy generation – Data mining primitives – Data mining Task

### **UNIT-III : ASSOCIATION RULES**

Association Rule Mining – Mining single dimensional Boolean association rules from transactional databases –. Classification and prediction – Issues regarding classification and prediction – Bayesian classification Classification by Back propagation – classification based on concepts from association rule mining

### **UNIT-IV : DATA MINING TECHNIQUES**

Cluster Analysis-A categorization of Major clustering methods- Partitioning methods Hierarchical methods -Grid based methods - Model based clustering methods Density - based methods.

## **UNIT - V : APPLICATIONS**

Applications and Trends in Data Mining – Data mining system Products and Research prototypes – Additional themes on Data mining – Social Impacts of Data Mining – Trends in Data mining Mining Spatial Databases – Mining Time series and sequence data – Mining the World wide web.

### **TEXT BOOK:**

Jiwei Han, Michelen Kamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers an Imprint Of Elsevier, 2001.(Chapters 1,2,3,4.1,6.1,6.2,7,8,9.2,9.4,9.6,10)

### **REFERENCE BOOKS:**

1. ArunK.Pujari, Data Mining Techniques, Universities Press(India) Limited, 2001.
2. George M. Marakas, Modern Data warehousing, Mining and Visualization: core concepts, Printice Hall, FirstEdition, 2002.
3. PangNing Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
4. Soman K. P, ShyamDiwakar, V. Ajay, Data Mining, Prentice Hall, 2008.

<b>II SEMESTER</b>		
<b>CP2</b>	<b>Core Practical II (Exam end of II Sem.)</b>	<b>15PCSC2P2</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Credits : 3</b>

**CORE PRACTICAL – II \* (Web Programming I Lab)**

1. Write a PHP code to print the multiplication table
2. Write a PHP code using string and numeric functions
3. Write a PHP code using array functions
4. Design a HTML form using HTML control and write a PHP code for displaying the employees information
5. Write a PHP code for Adding, Deleting and Modifying records.
6. Write a PHP code using function.
7. Write a Python code on Control structures
8. Write a Python code on String manipulations
9. Write a Python code on List Manipulations
10. Write a Python code on Dictionaries and Tuples

<b>III SEMESTER</b>			
<b>C9</b>	<b>MOBILE COMPUTING</b>	<b>15PCSC31</b>	
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT- I: INTRODUCTION TO MOBILE COMPUTING**

Mobility of bits and bytes – Wireless the beginning – Developing mobile Computing application – Mobile computing architecture – GSM – Architecture- Entities – Call Routing in GSM – PLMN Interfaces.

### **UNIT- II: INTRODUCTION TO DIGITAL TRANSMISSION**

Digital to Digital Conversion – Line Coding – line coding schemes – Block coding – Scrambling – Analog-to – Digital Conversion – Pulse code modulation –delta modulation – Transmission modes – Parallel Transmission – Serial Transmission.

### **UNIT- III : WAP & 3G**

Introduction to WAP – MMS, GPRS Application; CDMA and 3G: Spread Spectrum technology CDMA Vs GSM – wireless data – third generation networks – application on 3G

### **UNIT-IV : WIRELESS LAN, INTERNET NETWORKS AND INTERNETWORKING**

Introduction – Wireless LAN advantages IEEE802.11 standards wireless LAN architecture – mobility in wireless LAN - Wireless LAN security – Fundamentals of call processing – Intelligence in the networks – SS#7 – INCM – softswitch – programmable networks – Technologies and interfaces for IN.

## **UNIT- V : PROTOCOLS SUPPORTING MOBILITY**

Mobile network layer protocols such as mobile IP –Dynamic Host Configuration Protocol (DHCP)- Mobile transport layer protocols such mobile TCP, indirect –TCP – Wireless Application Protocol (WAP).

### **TEXTBOOKS:**

1. Asoke K Talukder & Roopa R Yavagal, Mobile Computing, Tata McGraw-Hill Publishing Company Limited, 2002, Chapters 4,5 ,Chapters 1,2,8,9,10,11
2. J.Schiller, Mobile Communications, ISBN:0-321-12381-6, Addison-Wesley, 2003,
3. BehrouzA Forouzan, Data Communications and Networking, Tata McGraw-Hill Publishing Company Limited, 2002, Chapters.

### **REFERENCE BOOKS:**

1. T.S. Rappaport, Wireless communications, Principle and Practice, Pearson, 2002.
2. A.S.Tanenbaum, Computer Networks, 4<sup>th</sup> edition, Publisher: Prentice Hall PTR; ISBN: 0130661023; August, 2002.

### **REFERENCE SITES:**

1. [www.dcg.ethz.ch](http://www.dcg.ethz.ch)
2. [www.informatik.uni-goettingen.de](http://www.informatik.uni-goettingen.de)
3. [www.ebookee.net](http://www.ebookee.net)



<b>III SEMESTER</b>			
<b>C10</b>	<b>PRINCIPLES OF COMPILER DESIGN</b>		<b>15PCSC32</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT-I : INDRODUCTION**

Introduction to Compiler: Language Processors- The Structure of a Compiler – The Evolution of Programming Languages – The Science of Building a Compiler – Application of Compiler Technology – Programming Language Basics. A Simple Syntax-Directed Translator: Syntax Definition – Syntax - Directed Translation – Parsing –A Translator of Simple Expression – Lexical Analysis - Symbol Table – Intermediate Code Generation.

### **UNIT- II : LEXICAL ANALYZER**

Lexical Analysis: The Role of the Lexical Analyzer - Input Buffering – Specification of Tokens - Recognition of Tokens – The Lexical- Analyzer Generator Lex – Finite Automata – From Regular Expression to Automata – Design of a Lexical-Analyzer Generator – Optimization of DFA-Based Pattern Matchers.

### **UNIT- III : SYNTAX ANALYZER**

Syntax Analysis: Introduction – Context-Free Grammars – Writing a Grammar – Top-Down Parsing – Bottom-Up Parsing – Introduction to LR Parsing: Simple LR – More Powerful LR Parsers – Using Ambiguous Grammars.

### **UNIT- IV : INTERMEDIATE-CODE GENERATION AND RUN-TIME ENVIRONMENT**

Intermediate-Code Generation: Variants of Syntax Trees – Three-Address Code – Types and Declarations – Translations of Expressions – Type Checking – Control Flow – Back patching – Switch Statements – Intermediate Code for Procedures. Run-Time Environments: Storage Organization – Stack Allocation of Space – Access to Nonlocal Data on the Stack.

## **UNIT-V : CODE GENERATION**

Code Generation: Issues in the Design of a Code Generator – The Target Language – Address in the Target Code – Basic Blocks and Flow Graph – Optimization of Basic Blocks – A Simple Code Generator – Peephole Optimization – Register Allocation and Assignments – Instruction Selection by Tree Rewriting - Optimal Code Generation for Expression – Dynamic Programming Code-Generation. Machine-Independent optimization: The Principal Source of Optimization.

### **TEXT BOOK:**

Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, “Compilers- Principles, Techniques and Tools”, Pearson Education Asia, 2011.

### **REFERENCE BOOKS:**

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, “Compilers- Principles, Techniques and Tools”, Pearson Education Asia, 2007
2. A.V. Aho, Ravi Sethi, J. D. Ullman, “Compilers- Principles, Techniques and Tools”, Addison- Wesley, 2003.
3. Allen I. Holub, Compiler Design in C, Prentice Hall of India, 2001
4. Fischer Leblanc, Crafting Compiler, Benjamin Cummings, Menlo Park, 1988.

<b>III SEMESTER</b>			
<b>C11</b>	<b>WEB PROGRAMMING II</b>	<b>15PCSC33</b>	
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT- I : INTRODUCING VISUAL C#**

What Constitutes a Visual C# Program - Storing Data - developing an Application - Applying type conversion - Discovering Visual C# Operators - Understanding Visual C# Statements - Unearthing Arrays - Using Single Dimensional arrays - Using Multidimensional Arrays - Understanding Jagged arrays.

### **UNIT- II : CLASSES**

Understanding Classes - Creating Classes - Understanding Class Members - Getting Started with a Windows Application - Adding a button to a form - Adding code - Understanding the CommonDialog Class.

### **UNIT- III : ASP.NET APPLICATIONS**

Getting started with ASP.Net Applications: Web Forms - Creating ASP.Net Web Forms Applications - IIS Application Roots - HTML and XML in ASP.Net. Using ASP.Net Web Forms for Server Controls: Beginning with Server Controls - Taking a closer look at Web Controls - Illustrating Basic Web controls. Working with validation controls: The Compare Validator control - The Range Validator control - Regular Expression Validator control - Custom Validator control - Validation Summary control - Multiple Validation control.

### **UNIT- IV : DEVELOPING ASP.NET SERVER CONTROLS**

Developing ASP.Net Server Controls: Developing ASP.Net Server Controls - Creating and using Web user control - Creating ASP.Net Pages to Web user controls - Creating and using Composite controls. Using Rich Web controls: AdRotator web server control - Calendar web server control - XML web server control. Debugging ASP.Net Web applications: Tracing ASP.Net Applications - Handling Errors in ASP.Net Applications.

## **UNIT- V : WORKING WITH XML**

Using ADO .NET with ASP .NET: ADO .NET - ADO .NET Object Model – Creating a Data Aware Application. Working with XML in Visual Studio .NET: Getting to know XML – Presenting XML related specifications – Converting Data from Relational format to XML format – Data Binding with XML documents. Deploying Web Applications: Creating a Deployment project – Testing the Installation program.

### **Text Book:**

Mridula Parihar, YeshSingal and Nitin Pandey, “Visual Studio .Net Programming”, PHI, 2002

### **Reference Books:**

1. Dino Esposito, Programming Microsoft ASP.NET 3.5, Microsoft, WP publishers (P) Ltd.
2. Donis Marshall, Programming Microsoft Visual C#2008, WP Publishers (P) Ltd.
3. Nitin Pandey ,” Microsoft ASP.NET”, PHI,2002
4. Kiric Allen Evans, Ashwin Kamanna, Joel and Muller, “XML and ASP.NET”, Pearson Education, First Indian Reprint, 2002
5. “ASP.NET Made Simple”, BPB Publications, First Edition, 2001

<b>III SEMESTER</b>		
<b>CP3</b>	<b>Core Practical - III (Exam end of IV Sem)</b>	<b>15PCSC4P1</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Credits : 3</b>

**CORE PRACTICAL – III \* (Web Programming II Lab)**

1. Program Using C#
2. Program Using Array
3. Program Using class and objects
4. Designing application using web controls
5. Program Using validator control
6. Designing application for creating and using composite controls
7. Designing application for rich web control using Ad-Rotator
8. Designing application to insert & update using database connection
9. Designing application to select & delete using database connection

<b>IV SEMESTER</b>			
<b>C12</b>	<b>CLOUD COMPUTING</b>		<b>15PCSC41</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

**UNIT-I : FUNDAMENTALS OF CLOUD COMPUTING**

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 - 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

**UNIT-II : CLOUD SERVICES**

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- III : INTRODUCTION TO BIG DATA**

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis Vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error

#### **UNIT- IV : DATA ANALYSIS**

Regression Modeling - Multivariate Analysis – Bayesian Methods  
– Bayesian Paradigm - Bayesian Modeling - Inference and Bayesian  
Networks - Support Vector and Kernel Methods - Analysis of Time  
Series: Linear Systems Analysis - Nonlinear Dynamics - Rule  
Induction - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy  
Decision Trees

#### **UNIT- V : SEARCH METHODS AND VISUALIZATION**

Search by simulated Annealing – Stochastic, Adaptive search by  
Evaluation – Evaluation Strategies – Genetic Algorithm – Genetic  
Programming – Visualization – Classification of Visual Data Analysis  
Techniques – Data Types – Visualization Techniques – Interaction  
techniques – Specific Visual data analysis Techniques

#### **TEXT BOOKS :**

1. Michael Miller, Cloud Computing : Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.

#### **REFERENCE BOOKS :**

1. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.
2. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.
3. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.

<b>IV SEMESTER</b>			
<b>C13</b>	<b>SOFT COMPUTING</b>		<b>15PCSC42</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

### **UNIT- I : NEURAL NETWORK AND SUPERVISED LEARNING NETWORK**

Basic Concepts of Neural networks – Evolution of Neural networks-Basic Models of Artificial neural network - Terminologies of ANN-McCulloch - Pitts Neuron - Linear separability - Hebb Network - Applications of Neural networks.

Supervised learning Network – Introduction – Perceptron Networks – Adaptive Linear Neuron – Multiple Adaptive Linear Neurons – Back propagation Network – Radial Basis function Network.

### **UNIT- II : ASSOCIATIVE MEMORY NETWORKS AND UNSUPERVISED LEARNING NETWORKS**

Associative Memory Networks - Introduction – Training algorithms for pattern association – Auto associative Memory Network – Bidirectional Associative Memory – Hopfield Networks.Unsupervised Learning networks - Introduction – Fixed Weight Competitive Nets - Kohonen Self - Organised Maps – Learning Vector Quantization – Adaptive Resonance Theory Network.

### **UNIT- III : FUZZY LOGIC**

Introduction to Classical Sets and Fuzzy Sets—Introduction – Classical sets – Fuzzy Sets. Classical Relation and Fuzzy Relations-Introduction – Cartesian product of a relation -Classical Relation – Fuzzy Relations..Membership Functions – Introduction - Features of Membership Functions – Fuzzification – Methods of Membership Value Assignments. Defuzzification –Introduction – Lambda-Cuts for Fuzzy Sets-Lambda-Cuts for Fuzzy Relations –Defuzzification Methods.

### **UNIT- IV : GENETIC ALGORITHM**

Fundamentals of Genetic Algorithms - History – Basic concepts – Creation of Offsprings – Working principle – Encoding – Fitness Function – Reproduction . Genetic Modelling – Inheritance Operators – Cross Over – Inversion and Deletion – Mutation Operator – Bit-wise Operators – Bit-wise Operators used in GA – Generational Cycle –



Convergence of Genetic Algorithm –Differences and similarities between GA and Other Traditional Methods - Advances in Genetic Algorithm.

## **UNIT- V : HYBRID SYSTEMS AND APPLICATIONS OF SOFT COMPUTING**

Integration of Neural Networks, Fuzzy Logic and Genetic Algorithms – Hybrid Systems –Neural Networks, Fuzzy Logic and Genetic Algorithms Hybrids- Preview of the Hybrid systems to be discussed. Genetic Algorithm based Back propagation Networks-GA based weight determination. ANFIS-Adaptive Neuro - Fuzzy Inference Systems – Introduction – ANFIS Architecture – Hybrid Learning Algorithm. Coactive Neuro - Fuzzy Modeling-Introduction – Framework. Applications of Soft Computing - Introduction – A Fusion approach of Multispectral Images with SAR Image for Flood area Analysis - Optimization of TSP using Genetic Algorithm Approach – Genetic Algorithm based Internet Search Technique.

### **REFERENCES:**

1. S.N Sivanandam S.N Deepa “Principles of Soft Computing”, Wiley –India, 2007.
2. S.Rajasekaran and G.A.V.Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithms”, PHI, 2004.
3. J.S.R.Jang, C.T.Sun and E.Mizutani, “Neuro-Fuzzy and Soft Computing”, PHI,Pearson Education 2004.
4. S.N.Sivanandam, S.N.Deepa, “Introduction to Genetic Algorithms”, Springer, 2007.
5. Timothy J.Ross,”Fuzzy Logic with Engineering Application “, McGraw Hill, 2000.
6. Davis E. Goldberg, ”Genetic Algorithms: Search, Optimization and Machine Learning” Addison Wesley, N.Y., 2003.

<b>IV SEMESTER</b>		
<b>C14</b>	<b>PROJECT</b>	<b>15PCSP41</b>
<b>Hrs/Week : 6</b>	<b>Hrs/Sem: 90</b>	<b>Credits: 5</b>

**Objective:**

Every PG student is required to prepare the project subject related – based on the guidelines of his / her project guide.

**The following are the guidelines to be adhered to**

- The project should be an individual one
- The language for the project is **English**
- The Minimum number of pages should be **60**
- Project observations, suggestions and conclusion shall form part of the project.
- The Projects will be evaluated both by the Internal as well as External Examiner each for 100 marks. The distribution of mark should be **60 marks for the Project Report and 40 marks for the Viva-voce Examination**. The Division of marks for the Project Report is as mentioned below:

<b>Particulars</b>	<b>Internal Examiner</b>	<b>External Examiner</b>
Wording of Title	5	5
Objectives/ Formulation including Hypothesis	5	5
Review of Literature	10	10
Relevance of Project to Social Needs	5	5
Methodology/ Technique/ Procedure Adopted	20	20
Summary/ Findings/ Conclusion	5	5
Bibliography/ Annexure/ Foot notes	10	10
<b>Total</b>	<b>60</b>	<b>60</b>

The average mark of Internal and External Examiner is considered as marks of project report.

<b>IV SEMESTER</b>		
<b>CP4</b>	<b>Core Practical – IV</b>	<b>15PCSC4P2</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Credits : 3</b>

**CORE PRACTICAL – IV \*(Image Processing Lab)**

1. Image Arithmetic
2. Point Operations
3. Neighbourhood Operations
4. Image Histogram
5. Fourier Transform
6. Color Image Processing
7. Morphological Operations
8. Image Segmentation

## **IV SEMESTER**

<b>E(M)A</b>	<b>DIGITAL IMAGE PROCESSING</b>	<b>15PCSE4A</b>
--------------	---------------------------------	-----------------

<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>
-----------------------	-----------------------	------------------------	--------------------

### **UNIT-I : INTRODUCTION TO IMAGE PROCESSING**

Digital Image Processing – Mat Lab Working Environment – Image Representation – reading images – Displaying images – Writing images – Data classes – Image types – Converting between data classes and image types – Array indexing – M-Function Programming

### **UNIT-II : SPATIAL DOMAIN AND FREQUENCY DOMAIN PROCESSING**

Intensity Transformation functions – Histogram processing and function plotting – spatial filtering – 2-D Discrete Fourier transformation – filtering in the frequency domain – generating and sharpening frequency domain filters

### **UNIT-III : IMAGE RESTORATION AND COLOR IMAGE PROCESSING**

Model of the image degradation / restoration process – Noise models – frequency domain filtering – direct inverse filtering – wiener filtering – constrained least square filtering – Lucy – Richardson algorithm – color image representation

### **UNIT-IV : IMAGE COMPRESSION**

Coding redundancy - inter pixel redundancy – psycho visual redundancy – JPEG compression

### **UNIT-V : MORPHOLOGICAL IMAGE PROCESSING**

Morphological image processing – dilation and erosion – morphological reconstruction

#### **TEXT BOOK:**

Rafael C.Conzalez, Richard E. Woods, Steven L. Eddins, Digital Image Processing using MATLAB, Pearson Education Inc, New Delhi, 2007.

#### **REFERENCE BOOKS :**

1. Chanda. B. Dutta Majumder, D. Digigal Image Processing and Analysis, Prentice Hall of India, New Delhi, 2007.
2. Gonzalez, R.C., Wintz P Digital Image Processing, Addison-wesley Longman Publishing Co, New Delhi – 1987
3. Scott E. Umbaug, Computer Vision and Image Processing, Prentice Hall International, New Delhi, 1998.

<b>IV SEMESTER</b>			
<b>E(M)B</b>	<b>OOAD and UML</b>		<b>15PCSE4B</b>
<b>Hrs / Week : 6</b>	<b>Hrs / Sem : 90</b>	<b>Hrs / Unit : 18</b>	<b>Credits : 5</b>

#### **UNIT-I : SYSTEM CONSTRUCTION**

Structured approach to system construction : SSADM/SADT -  
An overview of object oriented systems development & Life cycle

#### **UNIT-II : INTRODUCTION TO UML**

Various object oriented methodologies – Introduction to UML

#### **UNIT-III : OBJECT ORIENTED ANALYSIS**

Object oriented analysis – Use cases- Object classification,  
relationships, attributes, methods

#### **UNIT-IV : OBJECT ORIENTED DESIGN**

Object oriented design – Design axioms – Designing classes –  
Layering the software design :- data access layer, User interface layer,  
Control/business logic layer

#### **UNIT-V : UML MODELS**

UML - Examples on: Behavioral models – Structural models –  
Architectural models from real world problems.

#### **TEXT BOOKS :**

1. Bahrami Ali, Object oriented systems development, Irwin McGrawHill, 2005(First 4 units covered here).
2. Booch Grady, Rumbaugh James, Jacobson Ivar, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

#### **REFERENCE BOOKS :**

1. Meilir Page-Jones, “Fundamentals of Object Oriented Design in UML”, 4th ed., Pearson Education,2008.
2. Pascal Roques, “Modeling Software Systems Using UML2”, 2nd ed., WILEY- Dreamtech India Pvt.Ltd, 2004.
3. Atul Kahate, “Object Oriented Analysis & Design”, 1st ed., The McGraw-Hill Companies, 2008.
4. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, “UML 2 Toolkit”, 1st ed., WILEY DreamtechIndia Pvt. Ltd., 2003.

## DEPARTMENT OF COMPUTER SCIENCE (PG)

### Non-Major Elective Course offered to Other Major PG Students

IV SEMESTER			
<b>E(N)</b>	<b>INTERNET CONCEPTS AND WEB DESIGN</b>	<b>15PCSN31</b>	
<b>Hrs/Week: 6</b>	<b>Hrs/Sem: 90</b>	<b>Hrs/Unit: 18</b>	<b>Credits: 5</b>

#### UNIT-I : HISTORY OF HTML

History of HTML-HTML document-HEAD and BODY sections-Title, Prologue, Links-Comment line-Designing the BODY section-Aligning the headings-HR tag-Paragraphs-Tab settings-Images and Pictures-Embedding PNG format images.

#### UNIT-II : ORDERED AND UN ORDERED LISTS

Ordered and Un Ordered lists-Nested Lists-Headings in a list-Table Handling-Table Creation in HTML-Width of the table and Cells-Cell spanning-Coloring cells-column specification-DHTML and Style sheets-Defining styles-Elements of styles-Linking a style sheet to a HTML document-In -line styles-External style sheets-Internal style sheets-Multiple styles.

#### UNIT-III : FRAMES

Frames-Frameset definitions-Frame definitions-Nested framesets-Forms-Action attribute-Method attribute-Enctype attribute-Check Boxes-Radio Buttons-Text Fields-Text Areas-Password-Submit and Reset buttons-Drop down list-sample forms.

#### UNIT-IV : INTRODUCTION TO ASP

Introduction: what is ASP?-ASP Model-The Process of Serving an Active Server Page-Using Scripting Languages-Understanding Objects-Application Object-Request Object-Response Object-Server Object-Session Object.

#### UNIT-V : WORKING WITH HTML FORMS

Retrieving Form Data-Using Textboxes and Text Areas-Using Radio Buttons and Check boxes-Using Selected Lists-Validating Form Data.

#### TEXT BOOKS:

1. World Wide Web with HTML, Dr.C.Xavier., Tata McGraw – Hill Publishing Company.
2. Practical Asp, Ivan Bayross, BBP Publications

<b>SCHEME OF EXAMINATIONS UNDER CBCS (2015 - 2018)</b>
--------------------------------------------------------

The medium of instruction in all UG and PG courses is English and students shall write the CIA Tests and Semester Examinations in English. However, if the examinations were written in Tamil, the answer papers will be valued.

**POSTGRADUATE COURSES**

<b>SUBJECT</b>	<b>TOTAL MARKS</b>	<b>CIA TEST</b>	<b>SEMESTER EXAMINATION</b>	<b>PASSING MINIMUM</b>		
				<b>CIA EXAM.</b>	<b>SEM. EXAM.</b>	<b>OVER ALL</b>
<b>Theory</b>	100	25	75	nil	38	50
<b>Practical</b>	100	40	60	nil	30	50
<b>Project</b>	100	nil	Report - 60 marks Viva Voce - 40 marks	nil	50	50

### DIVISION OF MARKS FOR CIA TEST

SUBJECT	MARKS	ASSIGNMENT FOR UG / ASSIGNMENT OR SEMINAR FOR PG	REGULARITY	RECORD NOTE	TOTAL MARKS
<b>Theory</b>	20	5	--	--	<b>25</b>
<b>Practical</b>	30	--	5	5	<b>40</b>

1. The duration of each CIA Test is ONE hour and the Semester Examination is THREE hours.
2. Three CIA tests of 20 marks each will be conducted and the average marks of the best two tests out of the three tests will be taken.
3. The I test will be based on the first 1.5 units of the syllabus, the II test will be based on the next 1.5 units of the syllabus and the III test will be based on the next 1.5 units of the syllabus.
4. Two assignments for Undergraduate, Certificate, Diploma and Advanced Diploma Courses and two assignments OR two seminars for Postgraduate Courses.
5. The duration and the pattern of question paper for practical examination may be decided by the respective Boards of Studies. However, out of 60 marks in the semester practical examination, 10 marks may be allotted for record and 50 marks for practical.
6. Three internal practical tests of 25 marks each will be conducted for science students in the even semester and the best two out of the three will be taken. The total 50 marks of the best two tests will be converted to 30 by using the following formula:
 
$$\left( \frac{\text{Marks secured in the first best Practical Test (Out of 25)} + \text{Marks secured in the next best Practical Test (out of 25)}}{2} \right) \times 0.6$$
7. The Heads of Science Departments are requested to keep a record of attendance of practicals for students to assign marks for regularity.



**QUESTION PAPER PATTERN FOR CIA TEST (THEORY)**

**Duration: 1 Hr**

**Maximum Marks: 20**

<b>Section</b>	<b>Question Type</b>	<b>No. of Questions &amp; Marks</b>	<b>Marks</b>
<b>A</b>	No Choice Answer should not exceed 75 words	2 Questions 2 marks each	2 x 2 = 4
<b>B</b>	Internal choice (Either or type) Answer should not exceed 200 words	2 Questions 4 marks each	2 x 4 = 8
<b>C</b>	Open Choice (Answer ANY ONE out of Two) Answer should not exceed 400 words	1 Question 8 marks	1 x 8 = 8
<b>TOTAL</b>			<b>20 MARKS</b>

**QUESTION PAPER PATTERN FOR SEMESTER EXAMINATION (THEORY)**

**Duration: 3 Hrs**

**Maximum Marks: 75**

<b>Section</b>	<b>Question Type</b>	<b>No. of Questions &amp; Marks</b>	<b>Marks</b>
<b>A</b>	No Choice Answer should not exceed 75 words	10 Questions - 2 marks each (2 Questions from each unit)	10 x 2 = 20
<b>B</b>	Internal choice (Either or type) Answer should not exceed 200 words	5 Questions with internal choice. Each carries 5 marks (Two questions from each unit)	5 x 5 = 25
<b>C</b>	Open Choice (Answer ANY THREE out of FIVE) Answer should not exceed 400 words	3 Questions out of 5 - 10 marks each (1 Question from each unit)	3 x 10 = 30
<b>TOTAL</b>			<b>75 MARKS</b>

# **SADAKATHULLAH APPA COLLEGE**

**(AUTONOMOUS)**

**(Reaccredited by NAAC at an 'A' Grade with a CGPA of 3.40 out of 4.00 in the III cycle An ISO 9001:2008 Certified Institution)**

**RAHMATH NAGAR, TIRUNELVELI- 11.**

**Tamilnadu**

## **PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE (Unaided)**



### **CBCS SYLLABUS**

**For**

### **M.Phil. Computer Science**

**(Applicable for students admitted in June 2015 and onwards)**

**(As per the Resolutions of the Academic Council  
Meeting held on 23.02.2016)**



## CONTENTS

<b>Sl. No.</b>	<b>Content</b>	<b>Subject Code</b>	<b>Page No.</b>
1	Course Structure	-	1
2	Research Methodology	15MCSC11	2
3	Digital Image Processing	15MCSC12	4
4	Virtual Reality	15MCSE2A	6
5	Data Warehousing and Mining	15MCSE2B	8
6	Dissertation and Viva-voce	15MCSD21	10
7	Scheme of Examinations	-	12
8	Model for the Title Page of the Dissertation	-	15
9	Model for the Certificate of the Dissertation	-	16
10	Model for the Declaration by the Candidate	-	17



**SADAKATHULLAH APPA COLLEGE (AUTONOMOUS)**  
**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**  
**M.Phil. Computer Science Syllabus**  
**(Applicable for students admitted in June 2015 and onwards)**  
**COURSE STRUCTURE**

I SEMESTER			II SEMESTER		
COURSE	H/W	C	COURSE	H/W	C
Core 1	6	5	Elective (Area paper)	6	5
Core 2	6	5	Dissertation and Viva - voce	6	15
<b>TOTAL</b>	<b>12</b>	<b>10</b>	<b>TOTAL</b>	<b>12</b>	<b>20</b>

**DISTRIBUTION OF HOURS, CREDITS, NO. OF PAPERS, & MARKS**

SUBJECT	HOURS	CREDITS	NO. OF PAPERS	MARKS
Core	12	10	2	<b>200</b>
Elective (Area paper)	6	5	1	<b>100</b>
Dissertation and Viva-voce	6	15	1	<b>200</b>
<b>TOTAL</b>	<b>24</b>	<b>30</b>	<b>4</b>	<b>500</b>

**TITLE OF THE PAPERS**

**M. PHIL. COMPUTER SCIENCE (2015 - 2018)**

(The candidate should select any one of the Area Papers in the second semester related to their proposed topics of research)

SEM	P	TITLE OF THE PAPER	SUB. CODE	H/W	C	MARKS		
						I	E	T
<b>I</b>	C1	Research Methodology	15MCSC11	6	5	25	75	100
	C2	Digital Image Processing	15MCSC12	6	5	25	75	100
<b>II</b>	E	A) Virtual Reality	15MCSE2A	6	5	25	75	100
		B) Data Warehousing and Mining	15MCSE2B					
	D	Dissertation and Viva-voce	15MCSD21	6	15	--	200	200
<b>TOTAL</b>				<b>24</b>	<b>30</b>	<b>75</b>	<b>425</b>	<b>500</b>

**M. PHIL. COMPUTER SCIENCE SYLLABUS**  
**(Applicable for students admitted in June 2015 and onwards)**

<b>I SEMESTER</b>			
<b>C1</b>	<b>RESEARCH METHODOLOGY</b>	<b>15MCSC11</b>	
<b>Hrs/Week: 6</b>	<b>Hrs/ Sem: 90</b>	<b>Hrs/Unit: 18</b>	<b>Credits: 5</b>

**UNIT I**

Basic Research Methodology: Objective and Motivation in Research – Types of Research – Approaches and Significance of Research – Research Methodology versus Research Methods – Research Process–Finding a Research Advisor/Guide – What to Look for in a Potential Research Advisor/Guide – How to Find an Advisor/Guide – The Advisor–Advisee Relationship; Finding a Topic and Beginning Research – Getting Research Ideas – How to be an Active Reader and Listener – Getting Exposed to Research – Directed Study; Formulating the Research Problem: Develop the Nucleus of an Idea – Extensive Literature Survey: A Trap to Avoid – Choosing an Idea – Stay Active – Measure of Good Research – Common Problems for Researchers.

**UNIT II**

Overview of the Theory of Science and COMPUTER SCIENCE of Scientific Research – Overview of Research Methodology for Computing Research – Science versus Engineering – Distinct Perspective of Goals Research Methodology for Circuit Branches: Formulating the Research Problem – Research Design – Evolution of Computing Research

**UNIT III**

Research Methods for Computing Research – COMPUTER SCIENCE of Ideas in Computing – Measurements based Research Methods in Computer – Measurements based Research Methods in Signal and Image Processing – Graphics – Vision and Pattern Recognition – Deductive Methods in Computing Science.

## **UNIT IV**

Introduction: Basic Concepts of Pattern Recognition– Fundamental problems in Pattern Recognition– System Design– Design Concepts and Methodologies – Examples of Automatic Pattern Recognition Systems.

Pattern Classification by Distance Functions: Minimum Distance Pattern Classification – Cluster Seeking – Unsupervised Pattern Recognition Case Studies in Pattern Recognition: Clustering – Artificial Neural Networks – Image Analysis

## **UNIT V**

Searching for Scientific Papers – Writing and Presentation of a Research Paper for a Conference or Journal – Review and Opposition of Engineering/Scientific Research Papers – Writing a Good Thesis – Research Report Writing – Converting your Research thesis into a Monograph – Research Education – The Research Society and Research Policy.

### **REFERENCE BOOKS:**

1. Lecture Notes by Prof. Dr. Krishnan Nallaperumal on “Engineering Research Methodology – A Computer Science and Engineering and Information Technology Perspective.
2. Earl Gose, Richard Johnsonbaugh and Steve Jost, “Pattern Recognition and Image Analysis”, Prentice Hall, New Delhi, 2005.
3. Wolff D D Parsons M L, “Pattern Recognition Approach To Data Interpretation”, Plenum Press, 1983.
4. Julius T. Tou and Rafael C. Gonzalez, "Pattern Recognition Principles", Addison Wesley, New Delhi, 1974



<b>I SEMESTER</b>			
<b>C2</b>	<b>DIGITAL IMAGE PROCESSING</b>	<b>15MCSC12</b>	
<b>Hrs/Week: 6</b>	<b>Hrs/ Sem: 90</b>	<b>Hrs/Unit: 18</b>	<b>Credits: 5</b>

### **UNIT-I**

Digital Image Processing: Origins of Digital Image Processing - Steps in Digital Image Processing - Digital Image Fundamentals: Elements of Visual Perception - Light and the Electromagnetic Spectrum - Image Sensing and Acquisition - Image Sampling and Quantization - Basic Relationships between Pixels - Mathematical Tools used in Digital Image Processing.

### **UNIT-II**

Image Transformation & Filters: Basic Intensity Transformation Functions - Histogram Processing - Fundamentals of Spatial Filtering - Smoothing Spatial Filter - Sharpening Spatial Filters - Combining Spatial Enhancement methods - Fuzzy techniques for Intensity Transformation and Spatial Filtering. Filtering in the Frequency Domain: Preliminary Concepts - Sampling and the Fourier Transforms of Sampled Functions - The Discrete Fourier Transform (DFT) - Properties of the 2-D DFT - Filtering in the Frequency Domain - Image Smoothing and Sharpening using Frequency Domain Filters - Selective Filtering.

### **UNIT-III**

Image Restoration - Reconstruction - Image Degradation/Restoration process - Noise Models - Restoration in the presence of Noise only-Spatial Filtering - Periodic Noise Reduction by Frequency Domain Filtering - Linear - Position-Invariant Degradations - Estimating the Degradation Functions - Inverse Filtering - Wiener Square Error Filtering - Constrained Least Square Filtering - Geometric Mean Filter - Image Reconstruction from Projections.

### **UNIT-IV**

Image Compression: Fundamentals (Coding Redundancy - Interpixel Redundancy-Psycho visual Redundancy-Fidelity Criteria) - Image Compression Models (Source Encoder and Decoder) - Error Free Compression (Variable Length Coding - LZW Coding - Bit Plane Coding) -Lossy Compression (Transform Coding - Wavelet Coding) - Image Compression Standards (Continuous Tone Still Image - Video Compression Standards) -Wavelets and Multi resolution Processing: Multi resolution Expansion - Wavelet Transforms in One Dimension - The Fast Wavelet Transforms - Wavelet Transforms in Two

Dimensions - Wavelet Packets. Image Compression: Fundamentals - Basic Compression Methods - Digital Image Watermarking

### **UNIT-V**

Image Segmentation: Point - Line and Edge Detection - Thresholding - Region-Based Segmentation - Segmentation Using Morphological Watersheds - Use of Motion in Segmentation. Object Recognition: Patterns and Pattern Classes - Recognition Based on Decision-Theoretic Methods - Structural Methods.

### **Text Books:**

1. Rafael C. Gonzalez - Richard E. Woods - "Digital Image Processing" - 3rd Edition - Pearson Education - 2008.
2. Rafael C. Gonzalez - Richard E. Woods - "Digital Image Processing using MATLAB" -2nd Edition - Prentice Hall of India - 2002.
3. A.Jain -"Fundamentals of Digital Image Processing" - Prentice Hall of India.

<b>II SEMESTER</b>			
<b>E A</b>	<b>VIRTUAL REALITY</b>		<b>15MCSE2A</b>
<b>Hrs/Week: 6</b>	<b>Hrs/ Sem: 90</b>	<b>Hrs/Unit: 18</b>	<b>Credits: 5</b>

### **UNIT I**

Introduction to the Formats – such as VRML – X3D – MPEG4 – and other formats

### **UNIT II**

The VRML Consortium and ISO Standardization

- VRML 97
- Java 3D

### **UNIT III**

Programming languages and editors for VRML

- VRMLpad
- X-VRML
- VRML ++

### **UNIT IV**

Viewing and building VRML worlds

- Optimization a Bump mapping
- Multitexturing

### **UNIT V**

#### **Cyberspace and Virtual communities**

- Alpha Worlds
- Augmented Reality

#### **Uses of Virtual Reality for 40**

- Gaming environments
- CAVE systems
- Product advertising
- Manufacturing Optimization
- Calculation results visualization
- Operative mission planning in civil protection with GIS
- Simulation
- Internet Communities

## **REFERENCE BOOKS:**

1. The VRML 2.0 Handbook by Jed Hartman - Josie Wernecke - and Silicon Graphics (Paperback - Oct 10 - 1996)
2. Building VrmI Worlds by Claire Sanders - Charlie Scott - Paul Wolfe - and Sebastian Hassinger (Paperback - Dec 1996)
3. The Annotated VRML 2.0 Reference Manual by Rikk Carey and Gavin Bell (Paperback - Jun 6 - 1997)
4. Reality Architecture: Building 3D Worlds In Java and VRML by Mccarthy and Carty (Paperback - Feb 5 - 1998)
5. The VrmI Sourcebook by Andrea L. Ames - David R. Nadeau - and John L. Moreland (Paperback - Jan 1996)
6. VrmI: Browsing and Building Cyberspace by Mark Pesce (Paperback - Sep 1995)

<b>II SEMESTER</b>			
<b>E B</b>	<b>DATA WAREHOUSING AND MINING</b>	<b>15MCSE2B</b>	
<b>Hrs/Week: 6</b>	<b>Hrs/ Sem: 90</b>	<b>Hrs/Unit: 18</b>	<b>Credits: 5</b>

### **UNIT – I**

Data Warehousing Introduction – Definition-Architecture-Warehouse Schema-Warehouse server-OLAP operations. Data Warehouse technology – Hardware and operating system-Warehousing Software – Extraction tools – Transformation tools – Data quality tools – Data loaders – Data Access and retrieval tools – Data Modelling tools – Fact tables and dimensions Data warehousing case studies : Data warehousing in Government - Tourism - Industry - Genomics data.

### **UNIT - II**

Data Mining definition – DM Techniques – current trends in data mining - Different forms of Knowledge – Data selection - cleaning - Integration - Transformation - Reduction and Enrichment. Data: Types of data - Data Quality - Data Preprocessing - Measures of similarity and dissimilarity. Exploration: Summary statistics – Visualization.

### **UNIT – III**

Association rules: Introduction – Methods to discover association rule – Apriori algorithm Partition Algorithm – Pincher search algorithm – Dynamic Item set algorithm – FP Tree growth algorithm. Classification: Decision Tree classification – Bayesian Classification – Classification by Back Propagation.

### **UNIT - IV**

Clustering Techniques: Introduction – Clustering Paradigms – Partitioning Algorithms – K means & K Mediod algorithms – CLARA – CLARANS – Hierarchical clustering – DBSCAN – BIRCH – Categorical Clustering algorithms – STIRR – ROCK – CACTUS. Introduction to machine learning – Supervised learning – Unsupervised learning – Machine learning and data mining. Neural Networks: Introduction – Use of NN – Working of NN Genetic Algorithm: Introduction –Working of GA.

### **UNIT - V**

Web Mining: Introduction –Web content mining – Web structure mining –Web usage mining –Text mining –Text clustering - Temporal mining -Spatial mining –Visual data mining – Knowledge mining – Various tools and techniques for implementation using (weka - Rapidminer and Matlab).

**Text Books:**

1. Arun K Pujari - "Data Mining Techniques" - University press - Edition 2001.
2. Jaiwei Han -MichelinneKamber - "Data Mining : Concepts and Techniques"
3. Pang-Ning Tan - Michael Steinbach -Vipin Kumar - "Introduction to Data Mining" - 2007.
4. T.Sushmita mitra -Tir ku Acharaya - "Data Mining Multimedia - Softcomputing& Bioinformatics" - Wiley Interscience publications - 2004.
5. Michal J A Berry - Gordon Linoff - "Mastering Data Mining" - John Wiley & Sons - 2000.
6. Alex Berson - Stephen J.Smith - "Data Warehousing - Data Mining & OLAP " - Tata McGrawhill
7. C S R Prabhu - "Data Warehousing – concepts - techniques and applications " - 2nd Edition - Prentice Hall of India - 2002.

<b>II SEMESTER</b>		
<b>D</b>	<b>DISSERTATION</b>	<b>15MCSD21</b>
<b>Hrs/Week: 6</b>	<b>Hrs/ Sem: 90</b>	<b>Credits: 15</b>

The following guidelines have to be followed by every candidate while preparing his/her M.Phil. Dissertation:

- The Dissertation should be in English.
- The candidate has to follow the instructions of the Sadakathullah Appa College COMPUTER SCIENCE Research Centre with regard to the format and content of the Dissertation.
- The first page, Declaration and certificate of the dissertation should be according to the model given at the end of this.
- Dissertation text should be typed in usual MS-Office font with size 12 / 13 on A4 size Executive bond quality paper with double line spacing. Each page should contain at least 20 lines.
- The Dissertation should be submitted in duplicate.
- The number of pages in M.Phil. Dissertation should be not less 100 pages inclusive of bibliography and Annexure.
- Two bound copies of the M.Phil. Dissertation duly signed by the Guide and Head of the Department should be submitted through the Research Centre along with the CD containing the softcopy of the Dissertation in PDF format.
- Candidates shall submit the dissertation to the Research Centre through the Supervisor and Head of the Department within 6 months but not earlier than 5 months from the date of start of the second semester.
- The M.Phil. scholars should attend at least one of the following – training programmes, Workshops, Seminars, Symposiums, etc., and that they should also have a paper either published or received for acceptance in an ISSN / Reputed Journal before submitting the Dissertation. **Scholars who fail to comply with the above are not eligible for the submission of their Dissertation.** Photo copy of the publication/Letter of acceptance for publication should be given as Annexure at the end of the Dissertation.

- Both the Internal as well as External Examiner award 200 marks each for the Dissertation. The distribution of mark will be **120 marks for the Dissertation and 80 marks for the Public Viva-voce Examination**. In the Public Viva-voce Examination the M.Phil. Scholars should present their Dissertation work with PowerPoint Presentation. The Division of marks for the Dissertation is as mentioned below:

<b>Particulars</b>	<b>Internal Examiner</b>	<b>External Examiner</b>
Wording of Title	10	10
Objectives/ Formulation including Hypothesis	10	10
Review of Literature	20	20
Relevance of Dissertation to Social Needs	10	10
Methodology/ Techniq/ Procedure Adopted	30	30
Summary/ Findings/ Conclusion	10	10
Bibiliography/ Annexure/ Foot notes	20	20
Training/ Seminar/ Workshop	10	10
	<b>120</b>	<b>120</b>

The average mark of Internal and External Examiners is considered as marks of project report.



<b>SCHEME OF EXAMINATIONS UNDER CBCS</b>
------------------------------------------

The medium of instruction in all PG courses is English and students shall write the CIA and Semester Examinations in English.

**DISTRIBUTION OF MARKS FOR CIA AND SEMESTER EXAMINATIONS**

<b>SUBJECT</b>	<b>TOTAL MARKS</b>	<b>CIA TEST</b>	<b>SEMESTER EXAM.</b>	<b>PASSING MINIMUM</b>		
				<b>CIA EXAM.</b>	<b>SEM. EXAM.</b>	<b>OVER ALL</b>
<b>Theory</b>	100	25	75	Nil	38	50
<b>Project</b>	200	Nil	Report - 120 marks Viva - 80 marks	Nil	---	100

### DIVISION OF MARKS FOR CIA TEST

<b>SUBJECT</b>	<b>MARKS</b>	<b>ASSIGNMENT FOR UG / ASSIGNMENT OR SEMINAR FOR PG</b>	<b>REGULARITY</b>	<b>RECORD NOTE</b>	<b>TOTAL MARKS</b>
<b>Theory</b>	20	5	--	--	<b>25</b>
<b>Practical</b>	30	--	5	5	<b>40</b>

1. The duration of each CIA Test is ONE hour and the Semester Examination is THREE hours.
2. Three CIA tests of 20 marks each will be conducted and the average marks of the best two tests out of the three tests will be taken.
3. The I test will be based on the first 1.5 units of the syllabus, the II test will be based on the next 1.5 units of the syllabus and the III test will be based on the next 1.5 units of the syllabus.
4. Two examiners for M.Phil. Courses.

**QUESTION PAPER PATTERN FOR CIA TEST (THEORY)**

**Duration: 1 Hr**

**Maximum Marks: 20**

<b>Section</b>	<b>Question Type</b>	<b>No. of Questions &amp; Marks</b>	<b>Marks</b>
<b>A</b>	No Choice Answer should not exceed 75 words	2 Questions 2 marks each	$2 \times 2 = 4$
<b>B</b>	Internal choice (Either or type) Answer should not exceed 200 words	2 Questions 4 marks each	$2 \times 4 = 8$
<b>C</b>	Open Choice (Answer ANY ONE out of Two) Answer should not exceed 400 words	1 Question 8 marks	$1 \times 8 = 8$
<b>TOTAL</b>			<b>20 MARKS</b>

**QUESTION PAPER PATTERN FOR SEMESTER EXAMINATION (THEORY)**

**Duration: 3 Hrs**

**Maximum Marks: 75**

<b>Section</b>	<b>Question Type</b>	<b>No. of Questions &amp; Marks</b>	<b>Marks</b>
<b>A</b>	No Choice Answer should not exceed 75 words	10 Questions - 2 marks each (2 Questions from each unit)	$10 \times 2 = 20$
<b>B</b>	Internal choice (Either or type) Answer should not exceed 200 words	5 Questions with internal choice. Each carries 5 marks (Two questions from each unit)	$5 \times 5 = 25$
<b>C</b>	Open Choice (Answer ANY THREE out of FIVE) Answer should not exceed 400 words	3 Questions out of 5 - 10 marks each (1 Question from each unit)	$3 \times 10 = 30$
<b>TOTAL</b>			<b>75 MARKS</b>

(Model for the Title Page of the Dissertation)

# **TITLE OF THE DISSERTATION**

*Dissertation Submitted to the Sadakathullah  
Appa College (Autonomous) in partial fulfillment of the  
requirements for the award of the degree of*

**MASTER OF PHILOSOPHY (MAJOR)**

Submitted by

## **NAME OF THE CANDIDATE**

(REGISTER NO. XXXXXXXXX)

*Under the guidance of*

## **NAME OF THE GUIDE**

Designation of the Guide

Sadakathullah Appa College (Autonomous)

Tirunelveli – 627011



**PG & RESEARCH CENTRE IN (MAJOR)  
SADAKATHULLAH APPA COLLEGE (AUTONOMOUS)  
TIRUNELVELI – 627011  
MONTH, YEAR**

(Model for the Certificate of the Dissertation)

## **Name and Qualification of the Guide,**

Designation of the Guide,

Sadakathullah Appa College (Autonomous)

Rahmath Nagar,

Tirunelveli – 627011

## **CERTIFICATE**

Certified that the dissertation work with the title, **“TITLE OF THE DISSERTATION”** submitted by **NAME OF THE CANDIDATE** with the register number XXXXXXXX in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy in (Major) at the PG & Research Centre in (Major), Sadakathullah Appa College (Autonomous)**, is a work done by the candidate during the period 20XX-XX, under my guidance and supervision and this dissertation or any part thereof has not been submitted elsewhere for any other Degree or Diploma.

Tirunelveli – 627011

DD-MM-YEAR

**(NAME OF THE GUIDE)**

**Forwarded**

(Model for the Declaration by the Candidate)

**Name of the candidate,**

M.Phil. Scholar, (Register No.: XXXXXXXX)

PG & Research Centre in XXXXXXXX,

Sadakathullah Appa College (Autonomous),

Rahmath Nagar, Tirunelveli – 627011

**DECLARATION BY THE CANDIDATE**

I hereby declare that, the dissertation with the title, **“TITLE OF THE DISSERTATION”** submitted in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy in XXXXXXXX** at **the PG & Research Centre in XXXXXXXX , Sadakathullah Appa College (Autonomous)**, is my original work done under the guidance of **Name of the Guide, Designation of the Guide, Sadakathullah Appa College (Autonomous), Tirunelveli – 11** and this work has not been submitted elsewhere for any other Degree or Diploma.

Tirunelveli – 627011

DD-MM-YEAR

**(Signature of the Candidate)**

**Counter signed**

**(Signature and Seal of the Guide)**

Examiner 1:

Examiner 2: