Sri Ramakrishna College of Arts and Science
(Autonomous)
(Formerly S.N.R. Sons College)
(Affiliated to Bharathiar University)
(Re-Accredited with 'A' Grade by NAAC)
(An ISO 9001:2008 Certified Institution)
Nava India, Coimbatore-641 006, Tamil Nadu, India.

"Scheme of Examination along with Distribution of Marks and Credits"

CBCS & OBE PATTERN

SCHOOL OF COMPUTING

POST GRADUATE PROGRAMMES

M.Sc Computer Science Degree Course

(For the students admitted during the academic year 2017–2018 and onwards)

Study Components and Course Title	CIA	Comprehensive Exam		Compre-hensive Exam Total	Total	Credit
		Online	Descriptive Theory			
I SEMESTER						
Core-I :17MCS101 .NET Programming	30	20	50	70	100	4
Core-II :17MCS102 Object Oriented Analysis and Design	30	20	50	70	100	4
Core-III :17MCS103 J2EE	30	20	50	70	100	4
Core-IV :17MCS104 Information Security	30	20	50	70	100	4
Practical – I : 17MCS105 NET Programming LAB	30	-	-	70	100	4
Practical – II : 17MCS106 - J2EE LAB	30	-	-	70	100	4
II SEMESTER						
Core–V: 17MCS201-PHP with AJAX	30	20	50	70	100	4
Core–VI: 17MCS202 - ANDROID Application Development	30	20	50	70	100	4
Core–VII: 17MCS203-Network Management	30	20	50	70	100	4
Elective–I	30	20	50	70	100	4
Practical –III:	30	-	-	70	100	4

Course						
17MCS204 PHP Programming Lab						
Practical- IV: 17MCS205 Mobile Application Development Lab	30	-	-	70	100	4
17MCS206- Mini Project	80	-	-	20	100	3
III SEMESTER						
Core–VIII: 17MCS301- Data Science and Analytics	30	20	50	70	100	4
Core–IX: 17MCS302- Python Programming	30	20	50	70	100	4
Core–X: 17MCS303- Cloud Computing	30	20	50	70	100	4
Elective –II	30	20	50	70	100	4
Practical – V : 17MCS304- Data Science And Analytics Lab	30	-	-	70	100	4
Practical – VI : 17MCS305-Python Programming Lab	30	-	-	70	100	4
17MCS306- Mini Project	80	-	-	20	100	3
IDC – Self study paper**:** 17MCSOEI01- Internet of Things (IOT)		-	-	100	100$	3$
IV SEMESTER						
17MCS401-Project Work & Viva voce	160	-	-	40	200	12

List of Elective papers (Can choose any one of the paper as electives)		
Elective – I	A	17MCSE01 Data mining
	B	17MCSE02 Entrepreneurship Development
	C	17MCSE03 Grid Computing
Elective – II	A	17MCSE04 Information Storage Management
	B	17MCSE05 Software Testing
	C	17MCSE06 Service Oriented Architecture

Summary						
Subject	Papers	Credit	Total credits	Papers	marks	Total marks
Core (including Project work & Viva voce)	16	4	82	18	100	2000
	2	3				
	1	12		1	200	
Electives	2	4	8	2	100	200
IDC	1	3$		1	100	100$
Total			**90**			**2200**

$ - NOT INCLUDED IN TOTAL MARKS & CGPA calculations.

Note: Total credits may vary between 90 – 95

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(Autonomous)
(Formerly S.N.R Sons College).

17MCS101 .NET PROGRAMMING

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

Course Objectives
Student should be made to
- Able to effectively use visual studio .NET.
- Work knowledge of the C# and VB.NET programming language.
- Understand how to use forms to develop GUI programs under ASP.NET.
- learn some connection management and security fundamentals in ASP.NET
- Improve object-oriented programming skill through practice and insights gained by studying a new programming language.

UNIT I   **11 Hrs**
The .NET Framework: Introduction, Common Language Runtime, Common Type System, Common Language Specification, The base class library, The .Net Class Library Intermediate Language, Just In Time Compiler, Garbage Collection, Assemblies

UNIT II   **11 Hrs**
VB.Net Basic : Data Type, Identifiers, Variables & Constants, VB.Net Statements, Object & Classes, Arrays and Strings.
C# Basics: Data Type, Identifiers, Variables & Constants, C# Statements, Object & Classes, Arrays and Strings.

UNIT III   **12 Hrs**
ASP.NET Applications: ASP.NET File Types – Three ways to code web forms – ASP.NET Configuration. Web Control Classes – AutoPostBack and Web Control Events – A Simple Web Page Applet – Assessing Web Controls. Web Control Classes – AutoPostBack and Web Control Events Validation and Rich Controls: The Calendar Control – Formatting the Calendar – Restricting Dates – The AdRotator – The Advertisement File – The AdRotator Class. Validation: The Validation Controls – The Validation Process – The Validator Class – A Simple Validation Example.

UNIT IV   **11 Hrs**
Overview of ADO.NET - Introducing ADO.NET and Data management – Characteristics of ADO.NET – The ADO.NET Object Model. ADO.NET Data Access: SQL Basics – The SQL Select Statement – The SQL Update Statement – The SQL Insert Statement – The SQL Delete Statement – Accessing, Creating a Connection – Defining a Select Command – Updating Data – Accessing Disconnected Data – Selecting Multiple Tables – Modifying Disconnected Data – Updating Disconnected Data.

UNIT V   **10 Hrs**
Tracing logging and error handling: common errors – The .Net exception object – Handling Exception – Throwing own exceptions – Logging Exceptions – Error pages – Page Tracing.

                                                                                      Total Periods : 55 Hrs

Course Outcome
Having successfully completed this course, the student will be able to
- Design window and web based applications using the .NET Framework.
- Create console and window based application using C# and VB.Net
- Evaluate web-based applications by using various web controls in ASP.NET.
- Implement and deploy database connection management using ADO.NET.
- Develop security based web application for various business operations.

Text Books

1. ThearonWillis , Jonathan Crossland , Richard Blair , "Beginning VB.NET" ,Wiley dreamtech 2003.
2. Christian Nagel et al. "Professional C# 4 with .NET 4", Wiley India, 2010.
3. Matthew Mac Donald, "ASP.NET – The Complete Reference", Tata McGraw Hill 2005.

Reference Books:

1. 'Beginning ASP.NET 2.0 in C# 2005' by Apress
2. 'C# with .NET Framework ' by ShibiPannikar& Kumar Sanjeev
3. 'Undestanding .NET Framework ' by Tonybaer

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17MCS102 J2EE TECHNOLOGY

Course Objective

Student should be made to

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

- Understand JAVA programming language with object-oriented programming concepts
- Emphasis on event-driven programming methods
- Create and manipulating objects, classes, using Java for networking
- implement enterprise and middleware development

UNIT – I INTRODUCTION   11 Hrs
The Genesis of Java:Java's Bytecode – Java Characteristics – Object Oriented Programming-Lexical Issues-Variables, Data Types and Arrays- Operators- Control Statements. Introducing Classes—Methods-construtors-Inheritance – Package and Interfaces- Exceptional Handling – Multithreaded Programming- String Handling –FILE HANDLING.

UNIT – II JAVA PROGRAMMING   11 Hrs
Introduction to Enterprise Java Programming: Distributive Systems – Multi-Tier Architecture of J2EE – Clients and Client Tier – Web Tier – EJB Tier – EIS Tier – J2EE best practices - Enterprise Applications Strategy - Session Management.**Database Programming in Java**: Overview of the JDBC Process - JDBC Concepts - JDBC Driver types – Database Connection- JDBC/ODBC Bridge – Statement Objects – The Connection Interface – Result Set – Interacting with the database - Transaction Processing.

UNIT – III JAVA RMI   11 Hrs
Java Remote Method Invocation (RMI): Distributed Application Architecture – Client proxy and Server Proxy – Remote Interface and Passing Objects – RMI process - Defining and using Remote objects - Remote Object Activation - Object Serialization and RMI.

UNIT – IV JAVA SERVLETS   11 Hrs
Java Servlets: Basics – Benefits of Servlets - Initialization – Deployment – Reading Client Data – Reading HTTP Request Headers – Cookies - Session Tracking – Database Connections.**Java Server Pages (JSP)** - Overview - JSP tags - Components of a JSP page - Expressions –Script lets – Directives – Declarations - Working with JSP- JSP and JDBC.

UNIT – V INTRODUCTION TO QUERY METHODS   11 Hrs
JQuery: Introduction – Adding JQuery to Web pages- JQuery Editor – JQuery Selectors and Elements – Animations and Events handling in JQuery. **AJAX:** Overview- AJAX and JQuery- **Java ME-** Java for Mobile Devices.

                                                                                         Total Hours : 55 Hrs

Course Outcome
After successful completion of this course, the student will be able to:
- Evaluate ODBC and DAO database connectivityand Extend three tier applications using servlets.
- Understand Java programming concepts and utilize Java Graphical User Interface in program writing
- Build Java Application for distributed environment and Design and Develop multi-tier applications.
- Identify and Analyze Enterprise applications

TEXT BOOKS
1. Herbert Schildt, "The Complete Reference Java 2 "Tata McGrawHill publication,9thedition,reprint 2012.
2. Jim Keogh," The Complete Reference J2EE", Tata McGrawHill Publishing Company Ltd, 2010.
3. David Sawyer McFarland, "JavaScript and jQuery - The missing Manual", OReilly Publications, 3rd Edition, 2011.

REFERENCE BOOKS
1. Phil Kanna," The Complete Reference JSP 2.0", Tata McGrawHill Publishing Company Ltd, 2003.

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17MCS103 OBJECT ORIENTED ANALYSIS AND DESIGN

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

Course Objectives
- To develop background knowledge as well as core expertise in object oriented system.
- To provide the importance of the software design process.
- Understand basic Object Oriented Concepts such as design, Inheritance, Objects and classes
- Use design Patterns to refine the model
- To understand the design of an effective OO database

UNIT I   **11Hrs**

Introduction: What is Object-Oriented? - What is Object-Oriented Development? - Object-Oriented Themes - Evidence for Usefulness of Object-Oriented Development.Modeling As A Design Technique: Modeling - The Object Modeling Technique.
Object Modeling: Objects and Classes - Links and Associations - Advanced Link and Association Concepts - Generalization and Inheritance - Grouping Constructs -A Sample Object Model.

UNIT II   **11Hrs**

Analysis: Overview of Analysis - Problem Statement - Automated Teller Machine Example - Object Modeling - Dynamic Modeling - Functional Modeling - Adding Operations.

UNIT III   **11Hrs**

System Design: Overview of System Design - Breaking a System into Subsystems - Identifying Concurrency - Allocating Subsystems to Processors and Tasks - Management of Data Stores - Handling Global Resources - Choosing Software Control Implementation - Handling Boundary Conditions - Setting Trade-off Priorities - Common Architectural Frameworks - Architecture of the ATM System.

UNIT IV   **11Hrs**

Object Design : Overview of Object Design - Combining the Three Models - Designing Algorithms. Design Optimizations – Implementation of Control – Adjustment of Inheritance – Design of Associations – Object Representation.Comparison of Methodologies: Structured Analysis/Structured Design, Jackson Structured Development – Information Modeling Notations.
From Design To Implementation- Implementation Using a Programming Languages - Implementation Using a Database System - Implementation Outside a Computer.

UNIT V   **11 Hrs**

Object-Oriented Languages: Translating a Design into an Implementation - Class Definitions - Creating Object - Calling Operations - Using Inheritance - Implementing Associations - Object-Oriented Language Features - Survey of Object-Oriented Languages.
Applications: Object Diagram Compiler, Computer Animation: Problem Statement - Analysis - System Design - Object Design - Implementation.

                                        Total Periods: 55 Hrs

Course Outcomes
- To design the interface between the classes and objects.
- To build a model for the user interface (UI) of a software application
- To measure the Level of User satisfaction and software quality assurance.
- Gain exposure from design to Implementation
- To create class diagrams that model both the domain model and design model of a software system.
- Apply, analyze, model and design an effective Object Oriented system.

Text Book

1. James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy, William Lorensen "Object-Oriented Modeling and Design" – Prentice-Hall of India Publications, 2002.

Reference Books

1. Simon Bennett, Steve McRobb& Ray Former, "Object Oriented System Analysis & Design using UML ", Tata McGrawHill, 2005.
2. GraddyBooch, "Object Oriented Analysis and Design", Addison Wesley, First Edition, 1999.

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17MCSC101 INFORMATION SECURITY

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

Course Objectives
Student should be made to
- Understand about information security
- Recount the history of computer security and how it evolved into information security
- Define key terms and critical concepts of information security
- Enumerate the phases of the security systems development life cycle and Describe the information security roles of professionals within an organization

UNIT I   **11 Hrs**
   Introduction to Information Security: Introduction – History – What is Security – Critical Characteristic of Information – NSTISSC Security Model – Components of an Information System – Securing Components – Balancing information security and access – Approaches to Information Security Implementation – SDLC – The Security SDLC – Security Professionals & the Organization.

UNIT II   **11 Hrs**
   The Need For Security: Introduction – Business Needs – Threats – Attacks – Secure Software Development.
   Legal, Ethical & Professional Issues in Information Security: Introduction – Law & Ethics in Information Security – Relevant U.S. Laws – International Laws & Legal Bodies – Ethics & Information Security – Codes of Ethics & Professional Organization.

UNIT III   **11 Hrs**
   Cryptography: Introduction – Foundations of Cryptography – Cryptographic Tools – Attacks on Cryptosystems.
   Risk Management: An Overview of Risk Management – Risk Identification – Risk Assessment – Risk Control Strategies – Selecting a Risk Control Strategy – Quantitative Vs Qualitative Risk Control Practices – Risk Management Discussion points.

UNIT IV   **11 Hrs**
   Planning For Security: Introduction – Information Security Policy, Standards, and Practices – Information Security Blueprint – Continuity Strategies.
   Security Technology: Introduction – Physical Design – Firewalls – Protecting Remote Connections.
   Implementing Information Security: Introduction – Technical Topics of Implementation – Nontechnical Aspects of Implementation

UNIT V   **11 Hrs**
   Security Technology: Intrusion Detection & Prevention Systems – Honey Pots, Honey Nets, and Padded Cell System – Scanning & Analysis Tools – Access Control Devices.
   Physical Security: Introduction – Physical Access Control – Fire Security & Safety.
 Security & Personnel: Introduction – Employment Policies & Practices – Security Considerations for Nonemployees – Internal Control Strategies – Privacy & the Security for Personnel Data.
                   Total Hours : **55 Hrs**

Course Outcome

  After successful completion of this course, the student will be able to:

- Understand the concepts related to cryptography.
- Describe why security and its management are important for any modern organization
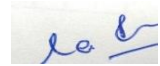- Learn security concepts and network access control mechanisms.

TEXT BOOK :

1. Michael E Whitman and Herbert J Mattord "Principles of Information Security", Vikas Publishing House, New Delhi, Fourth Edition, 2012

REFERENCES:

1. Micki Krause, Harold F.Tipton "Handbook of Information Security Management", , Vol 1-3 CRC Press LLC,2010
2. Stuart Mc Clure, Joel Scrambray, George Kurtz,   "Hacking Exposed", Tata McGrawHil, 2008.
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17MCS105- .NET PROGRAMMING LAB

Semester	I
Credit	4
type	Practical
Max. Marks	CIA -30 CE -70 TOT =100

Course Objectives
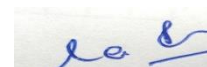
- Improve object-oriented programming skill through practice and insights gained in .NET environment.
- Giving the students about web programming concepts using C# and VB.NET.
- To learn the core topics of ASP.NET
- To manage databases using ADO.NET.
- It also concentrates on the usage of security in developing web applications in .Net environment.

Exercises

1. Create a VB.NET Program using Decision Control and looping Statements
2. Write a VB.NET program to count Words in a given Sentence
3. Write a C#.NET program Using Array Functions.
4. Write a C#.NET program using String Functions.
5. Write a ASP .NET program using all validator controls
6. Write a ASP .NET program to bind different web controls.
7. Write a ASP .NET program to create a cookie.
8. Create a student information Form and input records to a table in
a) MS Access Database Using ADO .NET And also display the records using Datagrid in VB.NET.
9. Create an Employee information Form and input records to a table in
a) MS Access Database Using ADO .NET Dataset in ASP.NET.
10. Create a Shopping cart project using ADO.NET, C#, ASP.NET & MS SQL Server.

Total Hours: 55 Hrs

Course Outcome

- Identify and apply .NET class library for developing applications.
- Create console and window based application using C# and VB.Net
- Evaluate web-based applications by using various web controls in ASP.NET.
- Develop database using ADO.NET.
- Implement security based web application for various business operations.

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17MCS106 J2EE LAB

COURSE OBJECTIVES

The student should made to

- Understand advanced java concepts, particularly object-oriented principles.
- Write, debug, and document well-structured Java applications.
- Implement Java classes from specifications, interfaces, inheritance, exceptions handling and polymorphism as programming techniques.
- create effectively and use objects from predefined class libraries.
- formulate problems and implement client/server Technologies.

Semester	I
Credit	4
Paper Types	Practical
Max. Marks	CIA -30 CE -70 TOT -100

LISTOF EXPERIEMENTS

1. Write a program in Java to implement inheritance.
2. Write a program to create a Java Package.
3. Write a program to implement Overloading and Overriding
4. Write a program to implement Multithreading.
5. Write a program to implement Exceptional handling with throws Exception class.
6. Write a program using JDBC for creating a table, Inserting, DELETING,UPDATING   records using SQL Database. and list out of records.
7. Write a program using Java servlet to handle form data.
8. Write a simple Servlet program to create a table of all the headers it receives along with their associated values.
9. Write a program in JSP by using session object.
10. Write a program to build a simple Client Server application using RMI.

Total Hours: 55 Hrs

Course Outcome

At the end of this semester the student is able to

- Understand Java programming concepts and utilize Java Graphical User Interface in program writing
- Design and Develop distributed and enterprise applications and multi-tier applications USING JDBC connectivity
- Develop graphical user interface application
- Implement program using servlets, JSP, RMI.

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17MCS201   PHP PROGRAMMING

Course Objectives

Student should be made to

- Introduce the importance of PHP in web page design.
- understand the features like functions, forms in PHP.
- understand Files handling, OOPs concepts , Cookies, Sessions and Data base.
- handle requests and draw images on the server with AJAX.

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

UNIT I   **11 Hrs**

PHP: Introduction – Essential PHP – Operators and Flow control: Working with math, assignment, increment and decrement, string, bitwise, execution, comparison and logical operators, Working with loops – Strings and Arrays.

UNIT II   **11 Hrs**

PHP Functions and Browser handling power: Creating Functions, passing functions, passing arrays, pass by reference, default arguments, returning data, arrays, lists, references, accessing global data, working with static variables, PHP conditional functions, variable functions, nesting functions – Reading data in web pages: Handling text fields, areas, check boxes, radio buttons, list boxes, password controls, hidden controls, image maps, file uploads, buttons – PHP Browser handling power.

UNIT III   **11 Hrs**

Working with Object oriented programming and File handling: Object oriented programming: creating classes, objects, setting access to properties and methods, using constructors and destructors, inheritance, overriding and overloading methods, auto loading classes – File Handling: open, read, close, parsing files, copy, delete, write and append files.

UNIT IV   **11 Hrs**

Working with databases and setting sessions, cookies and FTP: Databases: creating, accessing, updating, inserting, deleting and sorting databases – Setting sessions, cookies and FTP: setting , reading, deleting cookies, working, downloading, uploading, deleting, creating and removing directories with FTP.

UNIT V   **11 Hrs**

AJAX and Drawing Images on the server: Ajax: Handling AJAX requests, downloading images using AJAX, downloading javascript with AJAX– Drawing images on the server: creating and displaying images, drawing lines, rectangles, ellipse, arcs, polygons, figures, individual pixels, text, virtual text, working with image files, tiling images, copying images.

                                                                                             Total Hours: 55 Hrs

Course Outcome

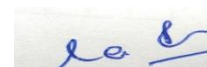 **At the end of this semester the student is able to**

- Utilizing the basic concept of statements and arrays.
- Implement functions and browser handling power of PHP.
- Imparting Database applications, File handling, Cookies in the webpage.
- Design and Implement Interactive Web Site using Forms, OOPS and AJAX.

TEXT BOOK

1.   Steven Holzner ,"The Complete Reference PHP Covers PHP 5.2", Tata McGraw-Hill Edition 2008.

REFERENCES

1. PHP6 and MySql6 Bible – Steve Svehring
2. PHP Programming Solutions – Vickram Viswani

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17MCS202 MOBILE APPLICATION DEVELOPMENT

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

Course Objectives

Student should be made to
- Understand mobile applications solve and analyze real world problems
- Develop and analyze the requirements of the software and efficient product designs.
- prepare the students for a successful career and work with values & social concern bridging the digital divide and meeting the requirements of Indian and multinational companies.
- awareness on the life-long learning and to introduce them to professional ethics and codes of professional practice.

UNIT I
INTRODUCTION 11 Hrs
Preliminary Considerations – Cost of Development – Importance of Mobile Strategies in Business World – Mobile Web Presence – Mobile Applications – Marketing – Web Services for Mobile Devices – Creating Example Web Service _ Debugging Web Service

UNIT II
MOBILE USER INTERFACE DESIGN 11 Hrs
Effective Use of Screen Real Estate – Understanding Mobile Application Users – Understanding Mobile Information Design – Understanding Mobile Platforms – Using the Tools for Mobile Interface Design – Choosing a Mobile Web Option – Adaptive Mobile Website – Mobile Web Applications with HTML 5

UNIT III
ANDROID APPLICATION DEVELOPMENT 11 Hrs
Getting to know the Android User Interfaces – Designing Your User interface using Views – Displaying Pictures and Menus with Views – Using Image views to Display pictures – Using menus with views – Data Persistence – Saving and loading user performances - Persisting data to files – Creating and using Data bases – Content Providers.

UNIT IV
ANDROID MESSAGING, NETWORKING, LOCATION BASED SERVICES 11 Hrs
SMS Messaging, Sending E-mail – Networking – Downloading Binary Data, Text Files- Accessing Web Services – Performing Asynchronous Calls – Location Based Services – Displaying Maps – Getting Location Data – Creating your own services – Communicating between a service and an activity – Binding activities to Services

UNIT V
IOS AND WINDOWS PHONE 11 Hrs
Getting started with iOS – iOS Project – Debugging iOS Apps – Objective C Basics – Hello Word App – Building the derby app in iOS – Windows Phone 7 Project – Building Derby App in Windows Phone 7.

Total Hours: 55 Hrs

Course Outcome
Having successfully completed this course, the student will be able to

- apply foundational mobile application concepts
- understand, identify, formulate and solve real world hardware and software problems.
- to work with database technologies, iOS apps
- examine mobile application market and web services for various mobile devices

TEXT BOOKS
1. Jeff McWherter and Scott Gowell," Professional Mobile Application Development", Wrox 2012.
2. Wei – Meng Lee, "Beginning Android Application Development", Wiley 2011

REFERENCE BOOKS
1. Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", Dream Tech. 2012

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17MCS203 NETWORK MANAGEMENT

Course Objectives
Student should be made

Semester	I
Credit	4
Paper Types	Core
Max. Marks	CIA -30 CE -70 TOT -100

- To understand the fundamental concepts of network management.
- To survey current network management systems and tools.
- To examine network management protocols.

UNIT – I
TECHNOLOGY SERVICES AND COMPUTER NETWORK TECHNOLOGY   **11 Hrs**
Introduction to Network Management-IT Services, Challenges, and Opportunities -Economics of IT Services-Network Management Systems and Organization-Network Components – Topologies - Internet Architecture - Bridged and Router Networks-Ring Networks, Virtual LANs, and Broadband Services.

UNIT – II
NETWORK MANAGEMENT   **11 Hrs**
Network Management Basics-Network Management Architectures & Applications Management Standards and Models – Network Management Functions-Configuration Management & Autodiscovery-Configuration Database & Reports-Abstract Syntax Notation One (ASN.1).

UNIT – III
SNMP PROTOCOL   **11 Hrs**
SNMP v1: Structure of Management Information-Std. Management Information Base (MIBs), Network Management Functions: Fault Management-Fault Identification and Isolation- Event Correlation Techniques. SNMP v2: Version 2 Protocol Specification-Version 2 MIB Enhancements-MIB-II, Case Diagrams - Security Management - Protecting Sensitive Information - Host and User Authentication-Key Management. SNMP v3: Version 3 Protocol & MIB - SNMP v3 User Based Security Model – View Based Access Model - Network Management Functions: Accounting Management - Performance Management- Network Usage, Metrics and Quotas.

UNIT – IV
REMOTE NETWORK MONITORING RMON   **11 Hrs**
RMON1: Statistics Collection- Alarms and Filters-Remote Network Monitoring RMON 2-Monitoring Network Protocol Traffic-Application-Layer Visibility-Management Tools, Systems and Applications-Test and Monitoring Tools-Integrating Tools-Development Tools- Web-based Enterprise Management-Enterprise Network Management: Network Management System Requirements- Network Management Applications and Systems.

UNIT – V
TELECOMMUNICATIONS MANAGEMENT FOR SERVICE PROVIDERS   **11 Hrs**
Telecommunications Network Management- ATM Management-Management of broadband Networks- Real-time OSs forNext-Generation Service Management-The Operations Systems Implications of Managing Next-Generation Networks Managing a Portfolio of Broadband Access Technologies-Next-Generation Network Design-Experiences in Establishing a Nationwide Broadband Network -Quality of Service in Heterogeneous Networks-Customer-Empowered Networking.

Total Hours: 55 Hrs

Course Outcome

Having successfully completed this course, the student will be able to

- Understand Network types and technology services.
- Understand Network Management Architecture
- Analyze SNMP protocol
- Analyze RMON tools for Network Management
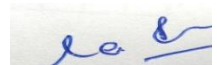- Implement Network management plan for large enterprise.

TEXT BOOKS

1. Int Subramanian, M., "Network Management: Principles and Practice", Addison-Wesley, 2000

REFERENCE BOOKS

1. Mauro, D.R. and Schmidt K.J.," Essential SNMP", O'Reilly & Associates, Sabastopol,CA. 2001.
2. Peterson L. and Davie B, "Computer Networks: A Systems Approach", Morgan Kaufmann Publishers Inc., 3rd edition, 2003.
3. Mahbub Hassan and Raj Jain, High Performance TCP/IP Networking, Prentice Hall, 1st Edition 2005.

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17MCS204   PHP Programming Lab

Course Objective:

Student should be made

- To understand various methods to handle string and array.
- To be aware of the OOPs concepts in PHP.
- To know the file handling techniques.
- To create database and to manipulate data.
- To be familiar with the graphics methods of PHP

Exercises

1. Write a PHP Program for associative array.
2. Write a PHP Program for String handling
3. Write a PHP Program to use various Functions of PHP.
4. Write a PHP Program to read form data.
5. Write a PHP Program to implement Inheritance.
6. Write a PHP Program to implement Overloading and overriding
7. Write a PHP Program for File handling.
8. Develop PHP Program to Create a Database and to Insert and Delete data.
9. Write a PHP Program to implement cookies.
10. Write a PHP Program for Drawing images on a web page.

Semester	I
Credit	4
Paper Types	Practical
Max. Marks	CIA -30 CE -70 TOT -100

Total Hours: 55 Hrs

Course Outcomes:
Having successfully completed this course the student will be able to

- handle array and string handling methods.
- Implement OOPs Concepts in an application.
- Create a database in MYSQL and to manipulate data into it.
- store information about client's session using Cookies.
- Design an interactive webpage with graphical techniques.

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17MCS205 Mobile Application Development Lab

Course Objectives
The student should be made to

Semester	II
Credit	4
Paper Types	Practical
Max. Marks	CIA -30 CE -70 TOT -100

- Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- Understand how to work with various mobile application development frameworks
- . Learn the basic and important design concepts and issues of development of mobile applications. Understand the capabilities and limitations of mobile devices.

Program list

1 .Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi threading
8. Develop a native application that uses GPS location information.
9. Write a mobile application that creates alarm clock
10. Implement an application that creates an alert upon receiving a message.

Total Hours : 55 Hrs

Course Outcome
Having successfully completed this course, the student will be able to

- Apply foundational mobile application concepts
- Understand, identify, formulate and solve real world hardware and software problems.
- Work with database and iOS apps
- Examine mobile application and web services for various mobile devices

Verified By

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17MCS206 MINI PROJECT

GUIDELINES TO M.Sc (Computer Science) MINI PROJECT REPORT PREPARATION

Course Objectives
Student should be made to

Semester	I
Credit	3
Paper Types	Project
Max. Marks	CIA -80 CE -20 TOT -100

- Formulate solutions to computing problems
- Analyze and compare alternative solutions to computing problems
- Design and implement effective solutions to computing problems
- Apply sound principles to the synthesis and analysis of computer systems

The students should strictly adhere to the following points while preparing their final project report.

- Students are expected to undergo project work individually and submit individual project report.
- Project reports should be typed / printed in double space using A4 size bond sheets with a left margin at column 10 and a right margin at column 75.
- A page should not contain more than 25 lines.
- The source code should be loaded and made readily available in the system during Viva – Voce examination for verification by the examiners.
- Table of contents should be in the specified format. [as in Annexure IV]
- The students are asked to report to the concerned guides regularly during their
- project period to present their progress of work.
- The students should submit the project report in the Last week of March, 2018.

Tentative Dates regarding Project

I Review   : Meet concern faculty guide to show form design on or before
20-01-2018.

II Review   : Meet concern faculty guide report about your table design and coding on or before
24-02-2018.

III Review   :   To run your project on or before 27-03-2018.

Rough Documentation of the Project, Submitted to the respective guides, get corrected and modifications any should be done. Final submission of the bounded project as per specifications - Last Week of MARCH, 2018.

** Exact dates will be intimated later

Note: For each Meeting internal marks will be awarded based on their
punctuality, performance and quality of work.

- The format of the report is as follows :

1. Wrapper (Annexure I)

2. Copy of the Wrapper

3. Certificate from the department (Annexure II)

4. Declaration by the student (Annexure III)

5. Acknowledgement

6. Table of contents (Annexure IV)

7. Chapters.

NOTE : (In all the meetings, students should meet the class in charge to sign in the attendance, Marks will be awarded for attendance)

Course Outcome

Having successfully completed this course, the student will be able to

- Work effectively in teams to design and implement solutions to computational problems
- Communicate effectively, both orally and in writing
- Think critically and creatively, both independently
- Recognize the social and ethical responsibilities of a professional working in the discipline
- Adapt to new developments in the field of computer science

Verified By   **Approved By**

{ANNEXURE I}

< PROJECT TITLE >

PROJECT WORK
DONE BY

NAME : < STUDENT NAME>

REG.NO : < REGISTER NUMBER >

Under the guidance of

<Name of the guide >
<Designation>

<COLLEGE EMBLEM>

DEPARTMENT OF COMPUTER SCIENCE
SRI RAMAKRISHNA COLLEGE OF ARTS AND SCIENCE
(FORMERLY S.N.R SONS COLLEGE-AUTONOMOUS)
(REACCREDITED WITH "A" BY NAAC)
(AFFILIATED TO BHARATHIAR UNIVERSITY)
COIMBATORE – 641 006.

APRIL 2018.

{NOTE: This is just a sample copy. You should take care of alignment, font, font size and spacing. }

{ANNEXURE II}

(Specimen Copy of Certificate)

CERTIFICATE

This is to certify that the project work entitled

<Name of the project >

done at

<Company Name>

is a bonafide record of work done by

<Student name >

<Register No. >

in partial fulfillment for the award of the degree of

MASTER OF COMPUTER SCIENCE

of Bharathiar University during

DECEMBER 2017 to APRIL 2018

Head of the Department,   Faculty Guide
<Name of HOD>   <Name of Guide>
Prof. & Head,   <Designation>
Dept. of Computer Sscience   Department of Computer Science
Sri Ramakrishna College of Arts   Sri Ramakrishna College of Arts and
and Science[AUTONOMOUS]   and Science, [AUTONOMOUS]

Submitted for the viva – voce examination held on _____

EXTERNAL EXAMINER   **INTERNAL EXAMINER**

{ANNEXURE III}

DECLARATION

       I hereby declare that this project work entitled _____ for submitted to SNR Sons College, An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore, is a record of original work done by me under the guidance of <guide name> and that this project work has not formed the basis for the award of any degree / diploma / associateship / fellowship or similar to any candidate in any university.

Place :

Date :   Signature of the Student

Countersigned by

<Guide Name >

{ANNEXURE – IV}

TABLE OF CONTENTS

(Specimen Copy of contents page)   Page No

17MCSE01 DATA MINING AND WAREHOUSING

Course Objective
The student should be made

Semester	I
Credit	4
Paper Types	Elective
Max. Marks	CIA -30 CE -70 TOT -100

- To Understand Data mining principles ,techniques and Introduce DM as a cutting edge business intelligence
- To expose the students to the concepts of Data warehousing Architecture ,OLAP and Implementation
- To learn to use association rule mining for handling large data
- To be clear with the concept of classification for the retrieval purposes
- To study the clustering techniques in details for better organization and retrieval of data
- To identify Business applications and Trends of Data mining

UNIT–I   **11 Hrs**

Data Mining: What motivated Data Mining?why it is important- What is Data Mining - Kind of Data – Data Mining Functionalities – Classification of Data Mining systems- Data Mining Task Primitives-Integration of a Data Mining system with a Database or Data Warehouse System
Data Preprocessing: Why Preprocess the Data – Data Cleaning – Data Integration and Transformation – Data Reduction

UNIT–II   **11 Hrs**
Data Warehouse and OLAP Technology: What is Data Warehouse – A Multidimensional Data Model – From Tables and spreadsheets to Data Cubes-Stars, Snowflakes and Fact Constellations-Examples -Data Warehouse Architecture – From Data Warehousing to Data Mining.

UNIT–III   **11 Hrs**
Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation -Attribute Oriented Induction-An Alternate Method for data Generalization and Concept Description

UNIT–IV   **11 Hrs**
Mining FrequentPatterns,Associations: Basic Concepts and a Road map-Efficient and scalable Frequent Itemset Mining Methods-The Apriori Algorithm-Generating Association Rules from Frequents Itemsets-Mining Various kinds of Association Rules.
Classification and Prediction: What is Classification and Prediction – Classification by Decision Tree Induction–BayesianClassification-Classification by back Propagation- Associative Classification:Classification by Association Rule Analysis- Prediction

UNIT–V   **11 Hrs**
Cluster Analysis: Definition – Types of Data – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical Methods – Density Based Methods.
Applications and Trends in Data Mining: Data Mining Applications - Trends in data Mining.

Total Periods: 55 Hrs

Course Outcomes
Having successfully completed this course the student will be able to
- Store voluminous data for online processing
- Preprocess the data for mining applications
- Apply the association rules for mining the data
- Analyze various classification techniques
- Cluster the high dimensional data for better organization of the data
- Discover the knowledge imbibed in the high dimensional system

Text Book
1.Jiawei Han and MichelineKamber "Data Mining Concepts and Techniques",Second Edition,
Morgan Kaufmann Publishers 2006

Reference Books

1. Pieter Adriaans, DolfZantinge, "Data Mining" , Pearson Education, 1998.
2. Sam Anahory and Dennis Murray, "Data Warehousing in the Real World " Pearson Education, 1997.

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17MCSE02 ENTREPRENEURSHIP DEVELOPMENT

Course Objective
Student should be made to
- Understand the elements of successful entrepreneurship, opportunity identification and assessment
- Know economic development potential of small business, alternative forms of work arrangements in the new economy balancing an entrepreneurial lifestyle.
- Be an leadership & management skills with best professional ethical practices and social concern.
- communicate effectively in both verbal and written forms and to be effective entrepreneur

Semester	II
Credit	4
Paper Types	Elective
Max. Marks	CIA -30 CE -70 TOT -100

UNIT I

ENTREPRENEURIAL COMPETENCE   **11 Hrs**

Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneur – Personality Characteristics of Successful. Entrepreneur – Knowledge and Skills Required for an Entrepreneur.

UNIT II

ENTREPRENEURIAL ENVIRONMENT   **11 Hrs**

Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organisational Services - Central and State Government Industrial Policies and Regulations - International Business.

UNIT III

BUSINESS PLAN PREPARATION   **11 Hrs**

Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Ownership - Capital - Budgeting Project Profile Preparation - Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT IV

LAUNCHING OF SMALL BUSINESS   **11 Hrs**

Finance and Human Resource Mobilization Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching.

UNIT V

MANAGEMENT OF SMALL BUSINESS   **11 Hrs**

Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units. Effective Management of small Business.

        Total Periods : 55 Hours

Course Outcome

    Having successfully completed this course, the student will be able to:

- Understand and apply the concept of entrepreneurship and its close relationship with enterprise and owner-management.o
- understand how to exxibit innovation and creativity in entrepreneursip and business development
- ability to organise and utilise the components of the planning process in the development of an new project
- Ability to evaluate the effective management of business units.

TEXT BOOK
1. "Hisrich, _Entrepreneurship', Tata McGraw Hill, New Delhi, 6th Edition

REFERENCES:
1. P. Saravanavel, _Entrepreneurial Development', Ess Pee kay Publishing House, Chennai.
2. S.S.Khanka, _Entrepreneurial Development', S.Chand and Company Limited, New Delhi, 2001.
3. Prasama Chandra, Projects – _Planning, Analysis, Selection, Implementation and Reviews', Tata McGraw-Hill Publishing Company Limited 1996.
4. P.C.Jain (ed.), _Handbook for New Entrepreneurs', EDII, Oxford University Press, New Delhi, 1999.

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17MCSE03 GRID COMPUTING

Course Objective

Student should be made to

- Impart the knowledge in Grid computing organization, Anatomy, Road Map, and Grid Services architecture.
- Compare and merge Grid services Architecture with web services Architecture
- Identify the Grid problem with virtual organizations
- Understand Web services using XML

Semester	I
Credit	4
Paper Types	Elective
Max. Marks	CIA -30 CE -70 TOT -100

UNIT I   11 Hrs

Introduction: Early Grid Activity, Current Grid Activity, Overview of Grid Business areas, Grid Applications, Grid Infrastructures.

UNIT II   11 Hrs

Grid Computing organization and their Roles: Organizations Developing Grid Standards, and Best practice Guidelines, Global Grid Forum (GCF), Organization Developing Grid Computing Toolkits and Framework, Organization and building and using grid based solutions to solve computing, commercial organization building and Grid Based solutions.

UNIT III   11 Hrs

Grid Computing Anatomy: The Grid Problem, The conceptual of virtual organizations, Grid Architecture and relationship to other distributed technology.

UNIT IV   11 Hrs

The Grid Computing Road Map: Autonomic computing, Business on demand and infrastructure virtualization, Service-Oriented Architecture and Grid, Semantic Grids
.

UNIT V   11 Hrs

Merging the Grid services Architecture with the Web Services Architecture: Service-Oriented Architecture, Web Service Architecture, #XML messages and Enveloping#, Service message description Mechanisms, Relationship between Web Services and Grid Services, Web services Interoperability and the role of the WS-I Organization.

                      Total Hours: 55 Hrs

Course Outcome

After successful completion of this course, the student will be able to:

- Understand the concepts related to Current Grid Activity
- Select proper technology and tool kit for using Grid computing
- Differentiate Grid services and Web services

Text Book:

1. Joshy Joseph and Craig Fellenstein, *Grid computing*, Pearson / IBM Press, PTR, 2014.

Books for References:

1. Ahmer Abbas and Graig computing, *A Practical Guide to technology and applications*, Charles River Media, 2013.

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17MCS301 – DATA SCIENCE AND ANALYTICS

Course Objectives:

- To understand the competitive advantages of big data analytics
- To learn the several key technologies used in manipulating, storing, and analyzing big data
- To learn data analysis methods
- To gain knowledge on R programming for big data analytics

Semester	III
Credit	4
Paper Type	Core
Max. Marks	CIA:30 + CE :70

UNIT I   INTRODUCTION TO BIG DATA ANALYTICS   **11**

Big Data Overview-Data Structures- Analyst Perspective on Data Repositories - State of the Practice in   Analytics- Business Intelligence versus Data Science-Current Analytical Architecture- Drivers of Big Data- Data Analytics Lifecycle Overview-Key Roles for a Successful Analytics Project -Background and Overview of Data Analytics Lifecycle - Phase 1: Discovery - Phase 2: Data Preparation - Phase 3: Model Planning - Phase 4: Model Building - Phase 5: Communicate Results -Phase 6: Operationalize.

UNIT II   INTRODUCTION TO R   **11**

Introduction and preliminaries – Vectors assignment and vector arithmetic – Index vectors - Objects, their modes and attributes - Ordered and unordered factors - Arrays - Matrices – Lists – Data Frames – Reading data from files - Grouping, loops and conditional execution – Functions

UNIT III STATISTICAL MODEL, GRAPHICS AND PACKAGES IN R   **11**

Linear models - Analysis of variance and model comparison - Generalized linear models - Nonlinear least squares and maximum likelihood models - non standard models - Graphical procedures: High-level plotting commands - The plot() function Displaying multivariate data - Display graphics - Graphics parameters list - Graphical elements-Packages - Standard packages - Contributed packages and CRAN – Namespaces

UNIT IV CLUSTERING AND ASSOCIATION RULES   **11**

Overview of Clustering - K-means - Use Cases Overview of the Method - Determining the Number of Clusters – Diagnostics - Additional Algorithms- Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - The Groceries Dataset - Frequent Itemset Generation - Rule Generation and Visualization

UNIT V REGRESSION AND CLASSIFICATION   **11**

Linear Regression - Logistic Regression - Reasons to Choose and Cautions - Additional Regression Models - Decision Trees - Naive Bayes - Diagnostics of Classifiers - Additional Classification Methods

Total Hours: 55

COURSE OUTCOMES

Upon successful completion of course the students will be able to

- deploying the Data Analytics Lifecycle to address big data analytics projects
- apply various functions and methods of R programming to large data sets
- understand how to implement graphical data analysis in R programming
- analyze data by utilizing various statistical and data mining approaches
- apply regression and classification models for data analysis.

TEXT BOOKS

 1. EMC2 Education Services, "Data Science Big Data Analytics- Discovering, Analyzing, Visualizing and Presenting Data" Wiley Publishing, Inc., 2015.
2. W.N Venables, D.M Smith and the R Core Team, An Introduction to R, Notes on R: A programming environment for Data Analysis and Graphics Version 3.4.4(2018-03-15).

REFERENCE BOOKS

1. Michael Berthold, David J. Hand, ―Intelligent Data Analysis‖, Springer, Second Edition, 2007.
2. Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013.
3. Richard Cotton, "Learning R – A Step-by-step Function Guide to Data Analysis, , O'Reilly Media, 2013.

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17MCS302-PYTHON PROGRAMMING

Semester	III
Credit	4
Max. Marks	CIA -30
	CE -70
	TOT =100

COURSE OBJECTIVES

- To gain experience about the object-oriented concept
- To help students to understand the implementation of Python
- To understand various features in Python

UNIT – I INTRODUCTION TO PYTHON   11

Introduction to Python- Features of Python – How to Run Python – Identifiers – Reserved Keywords- Variables- Comments in Python- Indentation in Python- Multi-Line Statements- Multiple Statement Group (Suite)- Quotes in Python- Input, Output and Import Functions- Operators

UNIT – II DATA TYPES, OPERATIONS & FUNCTION   11

Numbers- Strings –List- Tuple –Set- Dictionary - Data Type Conversion - Flow Control :- Decision Making - Loops - Nested Loops -Control Statements- Types of Loops- Function Definition - Function Calling - Function Arguments - Anonymous Functions (Lambda Functions)- Recursive Functions - Function with more than one return value

UNIT – III MODULES, PACKAGE & FILE HANDLING   11

Modules and Packages :- Built-in Modules - Creating Modules - *import* Statement - Locating Modules - Namespaces and Scope - The *dir()* function - The *reload()* function - Packages in Python - Date and Time Modules- **File Handling:-** Opening a File- Closing a File- Writing to a File- Reading from a File- File Methods- Renaming a File- Deleting a File- Directories in Python

UNIT – IV OBJECT ORIENTED PROGRAMMING & EXCEPTION HANDLING   11

Class Definition- Creating Objects - Built-in Attribute Methods - Built-in Class Attributes - Destructors in Python - Encapsulation - Data Hiding- Inheritance- Method Overriding- Polymorphism- Exception Handling:- Built-in Exceptions- Handling Exceptions- Exception with Arguments- Raising an Exception User-defined Exception- Assertions in Python

UNIT – V REGULAR EXPRESSIONS & DATABASE PROGRAMMING   11

The *match()* function-The *search()* function- Search and Replace - Regular Expression Modifiers: Option Flags - Regular Expression Patterns-Character Classes - Special Character Classes - Repetition Cases - findall() method - compile() method - **Database Programming** :- Connecting to a Database - Creating Tables -INSERT Operation - UPDATE Operation - DELETE Operation - READ Operation - Transaction Control - Disconnecting from a Database - Exception Handling in Databases

COURSE OUTCOME

Upon the successful completion of the course the student should be able to:

- Solve the given problem using the syntactical structures of Python
- Develop , execute and document computerized solution for various problems using the features of Python
- To read and write Python program that uses file Handling

Total Periods: 55

TEXT BOOK

1. Jeeva Jose,P.Sojan Lal ,Introduction to Computing and Problem solving with Python, Khanna Book Publishers, 40th Edition,New Delhi, 2016.

REFERENCE BOOKS

1. Richard L. Halterman ,Learning To Program With Python, New Delhi 2011.
2. Dave Kuhlman ,A Python Book: Beginning Python, Advanced Python, and Python Exercises, New Delhi, 2013.

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17MCS303 -CLOUD COMPUTING

COURSE OBJECTIVES
- Understand various basic concepts related to cloud computing technologies
- Understand the underlying principle of cloud virtualization, cloud storage, data management and data visualization.
- Understand different cloud programming platforms and tools

Semester	III
Credit	4
Paper Types	Core
Max. Marks	CIA -30 + CE -70

UNIT I : INTRODUCTION   11

Cloud Computing Introduction- Internet And The Cloud -Working Of Cloud Computing-Pros and Cons-Benefits-Developing Cloud Computing Services- Cloud Service Development- Discovering Cloud Services and Tools.

UNIT II: CLOUD COMPUTING TECHNOLOGY   11

Clients – Security – Network – Services – Platforms - Centralizing Email Communications, Cloud Computing For Community, Collaborating On Schedules – Web Applications – Web Apis – Web Browsers – Cloud Storage Overview – Cloud Storage Providers.

UNIT III: USING CLOUD SERVICES   11

Application – Client – Infrastructure – Service – Software as Service Overview – Driving Forces-Mobile Device Integration – Providers-Collaborating On Calendars- Schedules And Task Management- Exploring On Line Scheduling And Planning- Collaborating On Event Management-Collaborating On Contact Management- Collaborating On Project Management-, Collaborating On Word Processing- Spreadsheets-Databases.

Case Study: Microsoft Online   .

UNIT IV: LOCAL CLOUDS AND THIN CLIENTS   11

Virtualization In Organizations – Why And How To Virtualize – Concerns – Security – Server Solutions – Microsoft Hyper V – VMware – Thin Clients – Sun – Hewlett Packard – Dell- Evaluating Web Mail Services- Evaluating Instant Messaging- Evaluating Web Conference Tools- Creating Groups On Social Networks.

Case Study: McNielus Steel   .

UNIT V: STORING AND SHARING   11
Understanding Cloud Storage- Evaluating On Line File Storage- Exploring On Line – Book Marking Services- Exploring On Line Photo Editing Applications- Exploring Photo Sharing Communities-Controlling It With Web Based Desktops.

TOTAL PERIODS – (55L + 5T)

COURSE OUTCOMES
- Understand cloud computing .
- Able to understand the cloud computing technology.
- Write comprehensive case studies analyzing and contrasting different cloud computing solutions.
- Make recommendations on cloud computing solutions for an enterprise.

TEXT BOOK

1. Michael Miller, "Cloud Computing" Pearson Education, New Delhi, 2012

REFERENCE BOOKS

1. Anthony T Velte, "Cloud Computing: A practical Approach" Tata McGraw Hill, 2010.
2. Barrie Sosinsky, "Cloud Computing Bible" Wiley Publishing, Inc,.2011.
3. Rajkumar Buyya, Christian Vecchiola and Thamari Selvi S , "Mastering in CloudComputing" McGraw Hill Education (India), Private Limited, 2013.

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17MCS304 - DATA SCIENCE AND ANALYTICS LAB

Course Objective:

The Student should be made to:
- o Be exposed to big data
- o Learn the different ways of Data Analysis in R programming
- o Learn the mining and clustering
- o Be familiar with the visualization

Semester	III
Credit	4
Paper Type	Core
Max. Marks	CIA:30 + CE :70

EXERCISES:

1. Vectors, Arrays and Matrices
2. Simple and Advanced Functions in R
3. Data frames and Lists
4. Implement importing data into R and Exporting data from R
5. Implement database connectivity in R (using packages like RMySQL)
6. Implement Linear and logistic Regression
7. Implement SVM / Decision tree classification techniques
8. Implement clustering techniques
9. Visualize data using any plotting framework
10. Implement an application that stores big data in R

Total Hours: 55

Course Outcomes:

Upon Completion of this course, the students will be able to:

- ▪ Process big data using R
- ▪ Build and apply linear and logistic regression models
- ▪ Perform data analysis with machine learning methods
- ▪ Perform graphical data analysis

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17MCS305 PYTHON PROGRAMMING LAB

Semester	III
Credit	4
Max. Marks	CIA -30
	CE -70
	TOT =100

COURSE OBJECTIVES

- To strengthen their problem solving ability by applying python approach
- The purpose of this course is to introduce to students to the field of programming using Python.
- The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in Python.

EXERCISES

1. Write a python program to check whether a given number is an Armstrong number or not
2. Write a python program to find the sum, average and standard deviation for a given set of numbers
3. Write a Python program to display a magic square of order N where N is greater than 3 and N is odd.
4. Write a Python program to sort the numbers in descending order and ascending order.
5. Write a Python program to Convert integers in the range 1 to 100 into words
6. Write a Python program to check whether the string is a palindrome or not.
7. Write a Python program to count the number of words.
8. Write a python program to implement inheritance by displaying overall information of the students from the required classes.
9. Write a method to roll dice that takes two parameters : number of sides and number of dice to roll and generates random roll values for each dice rolled. Print out each roll and then the string "that's all".
10. Implement database concept to manipulate employee database.

Total Hours: 55

Course Outcomes

Upon the successful completion of the course the student should be able to:

- Know concepts in problem solving
- To do programming in Python
- To write diversified solutions using Python

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17MCS306-MINI PROJECT

Semester	III
Credit	3
Paper Type	Core
Max. Marks	CIA:80 + CE :20

COURSE OBJECTIVES

MIP-1. To estimate the ability of the student in transforming the theoretical knowledge studied so far into application software.

MIP-2. To gain experience in organization and implementation of a small project and thus acquire the necessary confidence to carry out main project in the final year

MIP-3. To understand and gain the knowledge of software engineering practices, so as to participate and manage large software engineering projects in future.

MIP-4. To create a novel research and education program for graduate students from computer science and engineering focused on the development of diagnostics methodologies and analytical models and tools.

COURSE OUTCOME

MIP-a. Ability to identify real world problems and analyse the need for computing solutions.

MIP-b. Ability to formulate the Mathematical Model for computing problems.

MIP-c. Ability to choose and apply modern design methodologies and advanced programming techniques. Test and debug the developed project.

MIP-d. Ability to produce the project in product based form.

MIP-e. Ability to present the project orally and in written report.

GUIDELINES TO MINI PROJECT REPORT

TENTATIVE SCHEDULE

I MEETING   :   **Submission of initial investigation to faculty guide**

II MEETING   :   **Presentation of Mini project and rough draft submission**

III MEETING: **Viva-Voce during semester lab practical**

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17MCSE04 - INFORMATION STORAGE MANAGEMENT

COURSE OBJECTIVES

- Understand storage architectures, including storage subsystems, DAS, SAN, NAS, CAS
- Define backup, recovery, disaster recovery, business continuity, and replication.
- Examine emerging technologies including IP-SAN
- Understand logical and physical components of a storage infrastructure
- Identify components of managing and monitoring the data center.
- Define information security and identify different storage virtualization technologies

Semester	III
Credit	4
Paper Types	ELECTIVE
Max. Marks	CIA -30 + CE -70

PREREQUISITE

To have a knowledge in the Databases and Networking Systems .

UNIT I: INTRODUCTION TO STORAGE TECHNOLOGY   11

Data creation and The value of data to a business- Information Lifecycle- Challenges in data storage and data management- Solutions available for data storage- Core elements of a Data Center infrastructure- role of each element in supporting business activities

UNIT II STORAGE SYSTEMS ARCHITECTURE   11

Hardware and software components of the host environment- Key protocols and concepts used by each component- Physical and logical components of a connectivity environment-,Major physical components of a disk drive and their function- logical constructs of a physical disk- access characteristics- performance Implications- Concept of RAID and its components-Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6- Integrated and Modular storage systems- ,high-level architecture and working of an intelligent storage system.

UNIT III: INTRODUCTION TO NETWORKED STORAGE   11

Evolution of networked storage- Architecture-components and topologies of FC-SAN, NAS, and IP-SAN- Benefits of the different networked storage options- Understand the need for long-term archiving solutions - describe how CAS fulfill the need-Understand the appropriateness of the different networked storage options for different application environments.

UNIT IV: INFORMATION MONITORING & MANAGING DATA CENTER   11

Reasons for planned/unplanned outages and the impact of downtime- Impact of downtime- Differentiate between business continuity (BC) and disaster recovery (DR), RTO and RPO- Identification of single points of failure in a storage infrastructure and solutions to mitigate these failures- Architecture of backup/recovery and the different backup/ recovery topologies- replication technologies and their role in ensuring information availability and business continuity- Remote replication technologies and their role in providing disaster recovery and business continuity capabilities- Key areas to monitor in a data center- Industry standards for data center monitoring and management-Key metrics to monitor storage infrastructure.

UNIT V: SECURING STORAGE AND STORAGE VIRTUALIZATION   11

Information Security- Critical security attributes for information systems- Storage security domains- Analyze the common threats in each domain-Storage Virtualization-Forms-Configurations and Challenges-Types of Storage Virtualization- Block-level and File-Level.

TOTAL PERIODS – (55L + 5T)

COURSE OUTCOMES
- Ability to identify key challenges in managing information and analyze different storage networking technologies and virtualization.
- Ability to understand components and the implementation of NAS. .
- To understand CAS architecture and types of archives and forms of virtualization.
- To monitor the storage infrastructure and management activities

TEXT BOOK

1. G.Somasundaram, Alok Shrivastava, "Information Storage and Management" EMC Education Series, Wiley, Publishing Inc., 2011.

REFERENCE BOOKS

1. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.
2. Marc Farley, "Building Storage Networks", TataMcGraw Hill, Osborne. 2001.
3. MeetaGupta, Storage Area Network Fundamentals, Pearson Education Limited, 2009.

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Approved by

17MCSE05 -SOFTWARE TESTING

COURSE OBJECTIVES

- To study fundamental concepts in software testing, objectives & strategies.
- To discuss various software testing methodologies
- To learn how to planning a test project, design test cases
- To understand software test automation problems and solutions.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects

Semester	III
Credit	4
Paper Types	ELECTIVE
Max. Marks	CIA -30 + CE -70

PREREQUISITE

Have a knowledge in the Software Engineering

UNIT I : INTRODUCTION   11

Software-Testing-Testing as a Process – Basic Definitions – Software Testing Principles – The Tester's Role in a Software development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository.

UNIT II : TEST CASE DESIGN   11

Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies – Using Black Box Approach to Test Case Design Random Testing – Requirements based testing – positive and negative testing -–– Boundary Value Analysis – decision tables - Equivalence Class Partitioning state-based testing– cause-effect graphing – error guessing -Compatibility testing – user documentation testing – domain testing Using White–Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III: LEVELS Of TESTING   11

The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests. The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – scenario testing – defect bash elimination -System Testing – types of system testing - Acceptance testing – performance testing – Regression Testing – internationalization testing – ad-hoc testing - Alpha – Beta Tests – testing OO systems – usability and accessibility testing.

UNIT IV: TEST MANAGEMENT   11

People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V : CONTROLLING AND MONITORING   11

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements – project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results. – evaluating software quality – defect prevention – testing maturity model .

TOTAL PERIODS – (55L + 5T)

COURSE OUTCOMES

- Design and conduct a software test process for a software testing project.
- Learn the needs of software test automation, and define and develop a test tool to support test

automation.

- Understand and identify various software testing problems, and solve these problems by Designing and selecting software test models, criteria, strategies, and methods.
- Analyze various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.
- Understand the knowledge of contemporary issues in software testing such as component- based Software testing problems
- Analyze software testing methods and modern tools for their testing projects.

TEXT BOOKS

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing -Principles and Practices", First Edition , Pearson Education, 2010.
2. Aditya P.Mathur, "Foundations of Software Testing", 2nd Edition,Pearson Education, 2013.

REFERENCE BOOKS

1. Naresh Chauhan, Software Testing Principles and Practices, Oxford University Press, 2010.
2. Boris Beizer, "Software Testing Techniques", Second Edition, Dreamtech, 2012.

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17MCSE06 -SERVICE ORIENTED ARCHITECTURE

COURSE OBJECTIVES:

Semester	III
Credit	4
Paper Types	ELECTIVE
Max. Marks	CIA -30 + CE -70

- Learn XML fundamentals.
- Be exposed to build applications based on XML.
- Understand the key principles behind SOA.
- Be familiar with the web services technology elements for realizing SOA.
- Learn the various web service standards.

Prerequisites
                Have a Knowledge in HTML and CSS
UNIT I : INTRODUCTION TO XML   **11**

XML document structure – Well formed and valid documents – Namespaces – DTD – XML Schema – X-Files.

UNIT II :BUILDING XML- BASED APPLICATIONS   11

Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL Formatting – Modeling Databases in XML.

UNIT III: SERVICE ORIENTED ARCHITECTURE   11

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures – Benefits of SOA - Principles of Service orientation – Service layers.

UNIT IV: WEB SERVICES   **11**

Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Message Exchange Patterns – Orchestration – Choreography –WS Transactions.

UNIT V BUILDING SOA-BASED APPLICATIONS   11

Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines — Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security – SOA support in J2EE
                                    TOTAL PERIODS-55L+5T

COURSE OUTCOMES:
Upon successful completion of this course, students will be able to:
- Build applications based on XML.
- Develop web services using technology elements.
- Build SOA-based applications for intra-enterprise and inter-enterprise applications.

TEXT BOOKS:
1. Ron Schmelzer et al. "XML and Web Services" Pearson Education, 2012.
2. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design" Pearson Education, 2005.

REFERENCE BOOKS:

1. Frank P.Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002
2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education, 2005
3. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 2004.

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17MCSOEI01-INTERNET of THINGS

COURSE OBJECTIVES

- Understand various basic concepts Internet of Things
- Understand the Challenges in Internet of Things
- Understand Applications of Internet of Things

Semester	III
Credit	3$
Paper Types	IDC – self study paper
Max. Marks	CE -100

UNIT I : INTRODUCTION to IoT

Defining IoT -Characteristics of IoT-Physical design of IoT-Logical design of IoT-Functional blocks of IoT- Communication models & APIs- IoT Applications.

UNIT-II : NETWORK & COMMUNICATION ASPECTS

Wireless medium access issues-MAC protocol survey-Survey routing protocols-Sensor deployment & Node discovery-Data aggregation & dissemination

UNIT-III: CHALLENGES IN IoT

Design challenges-Development challenges-Security challenges-Other challenges.

UNIT-IV DOMAIN SPECIFIC APPLICATIONS OF IoT

Home automation-Industry applications-Surveillance applications-Other IoT applications.

UNIT-V: DEVELOPING IoTs

Introduction to Python-Introduction to different IoT tools-Developing applications through IoT tools -Developing sensor based application through embedded system platform-Implementing IoT concepts with python.

COURSE OUTCOMES

- Understand the concepts of Internet of Things
- Analyze basic protocols in wireless sensor network
- Design IoT applications in different domain and be able to analyze their performance
- Implement basic IoT applications on embedded platform

TEXT BOOK

1. Arsheep Bahga, Vijay Madisetti, "Internet of Things: A Hands-On Approach" First Edition, New Delhi, 2015.

REFERENCE BOOKS

1. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"First Edition, Wiley Publishers,2010.
2. Adrian Mcewen , Hakin Cassimally, "Designing The Internet of Things" Second Edition, Wiley, 2015.

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Approved by

17MCS401 PROJECT WORK & VIVA VOCE

GUIDELINES TO M.Sc (Computer Science) MAIN PROJECT REPORT PREPARATION

Semester	IV
Credit	12
Paper Type	Core
Max. Marks	CIA:160 + CE :40

The students should strictly adhere to the following points while preparing their final project report.

- Students are expected to undergo project work individually and submit individual project report.
- Project reports should be typed / printed in double space using A4 size bond sheets with a left margin at column 10 and a right margin at column 75.
- A page should not contain more than 25 lines.
- The source code should be loaded and made readily available in the system during Viva – Voce examination for verification by the examiners.
- Table of contents should be in the specified format. [as in Annexure IV]
- The students are asked to report to the concerned guides regularly during their
- project period to present their progress of work.
- The students should submit the project report in the Last week of March, 2019.

Tentative Dates regarding Project

I Review : Meet concern faculty guide to show form design on or before 21-01-2019.

II Review : Meet concern faculty guide report about your table design and coding on or before 25-02-2019.

III Review : To run your project on or before 27-03-2019.

Rough Documentation of the Project, Submitted to the respective Guides, get corrected and modifications any should be done. Final Submission of the bounded project as per specifications - Last Week of MARCH, 2019.

** Exact dates will be intimated later

Note: For each Meeting internal marks will be awarded based on their Punctuality, performance and quality of work.

- The format of the report is as follows :

  1. Wrapper (Annexure I)
  2. Copy of the Wrapper
  3. Certificate from the department (Annexure II)
  4. Declaration by the student (Annexure III)
  5. Acknowledgement
  6. Table of contents (Annexure IV)
  7. Chapters.

NOTE: (In all the meetings, students should meet the class in charge to sign in the Attendance, Marks will be awarded for attendance)

{ANNEXURE I}

< PROJECT TITLE >

PROJECT WORK
DONE BY

NAME : < STUDENT NAME>

REG.NO : < REGISTER NUMBER >

Under the guidance of

<Name of the guide>
<Designation>

<COLLEGE EMBLEM>

DEPARTMENT OF COMPUTER SCIENCE
SRI RAMAKRISHNA COLLEGE OF ARTS AND SCIENCE
(FORMERLY S.N.R SONS COLLEGE-AUTONOMOUS)
(REACCREDITED WITH "A" BY NAAC)
(AFFILIATED TO BHARATHIAR UNIVERSITY)
COIMBATORE – 641 006.

APRIL 2019.

{NOTE: This is just a sample copy. You should take care of alignment, font, font size and spacing. }

{ANNEXURE II}

(Specimen Copy of Certificate)

CERTIFICATE

This is to certify that the project work entitled

<Name of the project >

done at

<Company Name>

is a bonafide record of work done by

<Student name >

<Register No. >

in partial fulfillment for the award of the degree of

MASTER OF COMPUTER SCIENCE

of Bharathiar University during

DECEMBER 2018to APRIL 2019

Head of the Department,   Faculty Guide
<Name of HOD>   <Name of Guide>
Prof. & Head,   <Designation>
Dept. of Computer Science   Department of Computer Science
Sri Ramakrishna College of Arts and Science, Sri Ramakrishna College of Arts and Science

Submitted for the viva – voce examination held on _____

EXTERNAL EXAMINER   **INTERNAL EXAMINER**

{ANNEXURE III}

DECLARATION

I hereby declare that this project work entitled _____ _ for submitted to Sri Ramakrishna College of Arts and Science (Formerly S.N.R. Sons College), An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore, is a record of original work done by me under the guidance of <guide name> and that this project work has not formed the basis for the award of any degree / diploma / associate ship / fellowship or similar to any candidate in any university.

Place :

Date :   Signature of the Student

Countersigned by

<Guide Name >

{ANNEXURE – IV}

TABLE OF CONTENTS

(Specimen Copy of contents page)   Page No