KRISHNA UNIVERSITY

B.Sc. Computer Science COURSE STRUCTURE

Semester	Part	Subject	Hrs.	Credits	IA	ES	Total
FIRST YEAR							
SEMESTER I	PART II	Computer Fundamentals & MS OFFICE	4	4	25	75	100
		Computer Fundamentals & MS OFFICE Lab	3	2	25	75	100
SEMESTER II	PART II	Programming in C	4	4	25	75	100
		C Programming Lab	3	2	25	75	100
SECOND YEAR							
SEMESTER III	PART II	Object Oriented Programming Using Java	4	4	25	75	100
		Java Lab	3	2	25	75	100
SEMESTER IV	PART II	Data Structures	4	4	25	75	100
		Data Structures Using Java	3	2	25	75	100
THIRD YEAR							
SEMESTER V	PART II	Data Base Management System	4	4	25	75	100
		A)Web Technologies B)Cloud Computing	4	4	25	75	100
		Using DBMS & Web Technology/ Cloud Computing Lab	3	2	25	75	100
SEMESTER VI	PART II	A)ASP.NET B)Mobile Application Development	4	4	25	75	100
		A)Information Security B) Programming PHP	4	4	25	75	100
		Project Work	3	2	25	75	100

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I YEAR I SEMESTER
COMPUTER FUNDAMENTALS AND MS OFFICE

Unit – I

Introduction to Computers
Input and Out Put Devices

Unit – II

Computer Memory and Processors
Number Systems and Computer Codes

Unit – III
Computer Software
Operating Systems

Unit – IV
Introduction to Algorithms and Programming Languages

MS Word:
Getting Started.
Working with Microsoft Office 2007.
Understanding Word Basics. Editing and Formatting Text. Formatting Documents
Working with Graphic Objects.

Unit – V
Microsoft Excel:
Understanding Excel Basics. Formatting and Editing the Worksheet. Using Formulas and Functions. Working with Charts.

Microsoft PowerPoint.:
Understanding PowerPoint Basics. Formatting and Modifying Presentations. Enhancing the Presentation.

TEXT BOOK:

1. Fundamentals Of Computers " by REEMA THAREJA from OXFORD UNIVERSITY PRESS
2. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls (UNIT I, UNIT II, UNIT III, UNIT IV)

REFERENCE BOOK:

1. "Computer Fundamentals and Programming in C" by REEMA THAREJA from OXFORD UNIVERSITY PRESS
2. **PC SOFTWARE UNDER WINDOWS** by Puneet Kumar And Sushil Bhardwaj From Kalyani Publishers

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I YEAR II SEMESTER
C - PROGRAMMING

Unit – I

Chapter 1. Introduction to Algorithms and Programming Languages
Chapter 2. Introduction to C

Unit – II

Chapter 3. Decision Control and Looping Statements
Chapter 4. Functions

Unit – III

Chapter 5. Arrays
Chapter 6. Strings

Unit – IV

Chapter 7. Pointers
Chapter 8. Structure, Union, and Enumerated Data Types

Unit – V

Chapter 9. Files

TEXT BOOK:

3. "Computer Fundamentals and Programming in C" by REEMA THAREJA from OXFORD UNIVERSITY PRESS

REFERENCE BOOK:

1. E Balagurusamy: ―COMPUTING FUNDAMENTALS & C PROGRAMMING‖ – Tata McGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3.
4. 1. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
5. 2. Henry Mullish & Huubert L.Cooper: The Sprit of C, Jaico Pub. House,1996.

II YEAR III SEMESTER
OBJECT ORIENTED PROGRAMMING USING JAVA

UNIT-I:

Object Oriented Programming: Introduction to OOP, Objects and Classes, Characteristics of OOP, Difference between OOP and Procedure Oriented Programming, Summary

Introduction to Java Programming: Introduction, Features of Java, Comparing Java and other languages, Applications and Applets,Java Development Kit, More Complex Programs, Java Source file structure, Prerequisites for Compiling and Running Java Programs.

UNIT-II:

Java Language Fundamentals: The building Blocks of Java , Data types , variable declarations , wrapper classes , Operators and Assignment , Control structures , Arrays , Strings , The String Buffer Class.

Java as an OOP Language: Defining classes , Modifiers , Packages , Interfaces.

UNIT-III:

Exception Handling : Introduction , Basics of Exception Handling in Java , Exception Hierarchy , Constructors and Methods in Throwable class , Unchecked and checked

exceptions , Handling exceptions in Java , Exception and Inheritance , Throwing User defined Exceptions , Redirecting and Rethrowing Exceptions , Advantages of Exception ,Handling Mechanism.

Multithreading: Introduction : An Overview of Threads , Creating Threads , Thread Life , cycle , Thread priorities and Thread scheduling , Thread synchronization , Thread groups , Communication of Threads.

UNIT-IV:

Files and I/O Streams : An Overview of I/O streams , Java I/O , File streams , File Input stream and File output stream , Filter streams , Random Access File , Serialization.

Applets: Introduction, Java applications versus Java Applets, Applet Life cycle, Working with Applets , The HTML Applet Tag.

UNIT-V:

Database Handling using JDBC: an Overview of DBMS, JDBC Architecture, working with JDBC, Processing Queries, The Transactions commit and Rollback, Hanling Exceptions, Mapping Database types to java, Accessing Metadata, Sample Programs to Handle Database.

The Abstract window Toolkit: Introduction, Drawing with crystals class, class Hierarchy of AWT, Event Handling, AWT controls, Layout Managers, The Java2D, Java2d Shapes.

TEXT BOOK:

1. P. Radha Krishna, “Object Oriented Programming Through Java”, Universities Press (2008)
2. Programming In Java By Sachin Malhotra And Saurabh Choudhary From Oxford University Press

REFERENCE BOOKS:

1. E.Balagurusamy, “Programming with Java”, 3e, TMH,2007
2. H.M.Deitel, P.J.Deitel, “Java How to Program”, Sixth Edition, Pearson Education,2007
3. ISRD Group, “Introduction to Object Oriented Programming through Java”, TMH ,2007.
4. Timothy Budd, “Understanding Object-Oriented Programming with Java”, Pearson Education,2007
5. Patrick Naughton & Herbet Schildt,” The complete reference java 2”,fourth edition,TMH,2007

II YEAR IV SEMESTER
DATA STRUCTURES

UNIT I

PROBLEM SOLVING

Problem solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample algorithms.

UNIT II

LISTS, STACKS AND QUEUES

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III

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TREES

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap

UNIT IV

SORTING

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting

UNIT V

GRAPHS

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth - First Search – Undirected Graphs –Biconnectivity – Introduction to NPCompleteness

REFERENCE BOOKS :

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.
3. ISRD Group, "Data Structures using C", Tata McGraw Hill, 2007
4. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudo code Approach with C", ThomsonBrooks / COLE, 1998.

III YEAR V SEMESTER

DATABASE MANAGEMENT SYSTEMS

UNIT I

Introduction

Purpose of Database System -– Views of data – Data Models – Database Languages — Database System Architecture – Database users and Administrator – Entity– Relationship model (E-R model) – E-R Diagrams -- Introduction to relational databases

UNIT II

Relational Model

The relational Model – The catalog- Types– Keys

SQL – An overview of SQL – Terminology – Object name- categories of SQL commands – Create a table – create table, table name, Column name, Data type, width, Multiple column names , Integrity constraints, constraint name, Disable constraints- Comment lines – Alter Table structure- Alter a table – add Specification- Modify Specification – Drop Specification – Enable/Disable constraint – Rename a table-Drop a table.

Insert a Row- -verification – Commit, Rollback and SavePoint – Substitution Variables- Forward slash- Default option – Update Rows – Update column values

in rows, where clause – Comparison Operators – SQL operators- Between, in, like Null value-is Null- Not operator-Multiple conditions-

check option- transfer data from old column to new column- Delete Rows – Delete from table – truncate – Query from tables- features of SQL – select statement, Groupby clause, orderby clause – Literal – Define – Double Ampersand(&&)- System table Dual and Tab.

Built-in Functions – Number Functions – Character Functions – Date Functions – Conversion functions – Group functions-

Joins – out join, self join – set operators – View – Define, Retrieve, rename and Drop View- DML operations using view- Advantage and disadvantages- Sequence – Create, alter, drop sequence – Index- Create, rename, rebuild and drop index.

UNIT III

Database Design

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal FormMulti-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

UNIT IV

Transactions

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency.

UNIT V

PL/SQL – Introduction, advantages of PL/SQL, Block structure of PL/SQL - Control flow statements – If Statements, Looping statements – While statement, for statement, loop – end loop statements – PL/SQL simple Programs – Procedures – Insert , update, delete and query a row –exception handling – Exception Propagation - functions- Create, Call and Drop function- packages – Create package header, create package body, execute and drop Package – trigger – Create, Diable/enable and Drop trigger- Cursors – Introduction , cursor with for loop, fetch cursor, populate table using cursor, cursor within cursor.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fifth Edition, Tata McGraw Hill, 2006 (Unit I and Unit-V) . 2. C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.(Unit II, III and IV)

2.Learning Oracle Sql & Pl/Sql: A Simplified Guide, By Rajeeb C. Chatterjee, PH of India.(for SQL and PL/SQL part)

References:

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition , Pearson / Addision wesley, 2007. 2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003. 3. S.K.Singh, "Database Systems Concepts, Design and Applications", First Edition, Pearson Education, 2006.

WEB TECHNOLOGY

UNIT-I:

TCP/IP: TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.

UNIT-II:

DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing - Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia – Remote Login (TELNET).

UNIT-III:

Introduction to Web Technology: Web pages – Tiers – Concept of a Tier – Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins – Frames – Forms. Dynamic Web Pages: Need – Magic of Dynamic Web Pages – Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface – ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

UNIT-IV:

Active Web Pages: Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. Middleware and Component-Based E-Commerce Architectures: CORBA – Java Remote Method Invocation – DCOM. EDI: Overview – Origins of EDI – Understanding of EDI – Data Exchange Standards – EDI Architecture – Significance of EDI – Financial EDI – EDI and internet.

UNIT-V:

XML: SGML – Basics of XML – XML Parsers – Need for a standard. WAP: Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.

TEXTBOOKS:

1. WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures – Achyut S Godbole & Atul Kahate, 2007 ,TMH.

REFERENCE BOOKS:

1. INTERNET AND WEB TECHNOLOGIES – Rajkamal, TMH.

2. TCP/IP PROTOCOL SUITE – Behrouz A. Forouzan, 3rd edition, TMH.

CLOUD COMPUTING

UNIT I

INTRODUCTION & CONCEPTS

Introduction to cloud computing: introduction, characteristics of cloud computing, cloud models, cloud services examples, cloud-based services & applications.

CLOUD CONCEPTS & TECHNOLOGIES

Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Networking Function Virtualization, Mapreduce, Identity And Access Management, Service Level Agreements, Billing.

UNIT II

CLOUD SERVICES & PLATFORMS

Compute Services, Storage Services, Database Services, Applications Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software.

HADOOP & MAPREDUCE

Apache Hadoop, Hadoop MapReduce Job Execution, Hadoop Schedulers, Hadoop Cluster Setup

UNIT III

CLOUD APPLICATION DESIGN

Introduction, Design Considerations for Cloud Applications, Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

UNIT IV

PYTHON BASICS

Introduction, Installing Python, Python Data Types & Data Structures, Control flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes 163.

UNIT V

PYTHON FOR CLOUD

Python for Amazon Web Services, Python for Google Cloud Platform, Python for Windows Azure, Python for MapReduce, Python Packages for Interest, Python Web Application Framework- Django, Designing a RESTful Web API.

CLOUD APPLICATION DEVELOPMENT IN PYTHON

Design Approaches, Image Processing App, Document Storage App, MapReduce App, Social Media Analytics App.

TEXT BOOK:

1. Cloud Computing A Hands On Approach By Arshdeep Bahga And Vijay Madisetti From University Press.

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III YEAR VI SEMESTER

ASP.NET

UNIT-I:

Introduction to .NET - .NET Framework - Components of Framework (CLR - CLS -CTS) VB.Net - Variables and Data Types - Object Variables & their Binding - Control Structures - Arrays – Functions - Parameters and Arguments - Window Forms. Introduction to Web Applications - Static Web Pages - Limitations of Static Web Pages - Web Server - Dynamic Web Pages - Client-Side Dynamic Web Pages - Server-Side Dynamic Web Pages - ASP.Net - ASP.Net Namespace.

UNIT-II:

Data types - Variable Scope - Constants - Operator - Control Structures - Defining and Using Functions - Conversion Functions – Arrays - Data Collections - Array List - Hashtables. ASP.NET Server Controls - ASP.NET Web Controls - HTML Server Controls - HTML Server Controls versus Web Controls - Web Controls - Rich Object Model - Events - Page Lifecycle - Data Rendering Controls - Rich Controls - Validation Controls.

UNIT-III:

Introducing HTML Forms and Web Forms - Working with Server Controls -Implementing ASP.Net Server Controls - Validating Forms with Validation Controls. Event - Driven Programming and Postback - Event - Event-Driven Programming - HTML Events - ASP.NET Page Events - ASP.NET Web Control Events - The IsPostBack Test.

UNIT-IV:

ADO.NET - Connection Classes - Command Data Components – Data Adapter Components – Data Set Data Component – Data View Data Component – Data Grid Component.

UNIT-V:

Users and Applications - Cookies - Sessions - Applications - Global.asax – Caching - Web Services - Web Service - HTTP - XML - and Web Services - HTTP GET - HTTP POST - Simple Object Access Protocol (SOAP) - Building an ASP.NET Web Service - Web Methods - Web Service Discovery - Securing a Web Service.

TEXT BOOKS:

1. Beginning ASP.Net 1.1 – Wrox, Chris Ullman, John Kauffman.
2. Professional ADO.NET Programming - Wrox, Bipin Joshi, Paul Dickinson.
3. The Complete Reference - McGraw Hill MacDonald, Mathew.
4. Rescued by Active Server Pages & ASP.Net – Francis, Thomson Learning.

MOBILE APP DEVELOPMENT

UNIT I

INTRODUCTION Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications

UNIT II

BASIC DESIGN

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

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UNIT III

ADVANCED DESIGN

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV

TECHNOLOGY - ANDROID

Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

UNIT V

TECHNOLOGY II - IOS

Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.

REFERENCES:

1. http://developer.android.com/develop/index.html
2. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012
3. Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012
4. James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012
5. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS
6 Development: Exploring the iOS SDK”, Apress, 2013.

INFORMATION SECURITY

UNIT I

INTRODUCTION

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II

SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III

SECURITY ANALYSIS

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV

LOGICAL DESIGN

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V

PHYSICAL DESIGN

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

REFERENCE BOOKS:

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3
CRC Press LLC, 2004.
3. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
4. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.

PROGRAMMING PHP

UNIT I

Introduction to PHP
Language Basics
Functions

UNIT II

Strings
Arrays
Objects

UNIT III

Web Techniques
Databases
Graphics

UNIT IV

PDF
XML

UNIT V

Security
Web Services

TEXT BOOK

1. PROGRAMMING PHP by Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf FROM O'Reilly Media, Inc.
2. Beginning PHP and MySQL: From Novice to Professional by W. Jason Gilmore FROM Apress

PROJECT WORK

The project will be one semester duration. The student will be advised to approach different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study. They will have to carry out a project work related to the area of interest and submit a project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce examinations.