### Andhra Pradesh State Council of Higher Education

**BCA Under CBCS with effect from the academic year 2016-2017 course of study**

**Table-6: B.C.A. SEMESTER – VI**

<table>
<thead>
<tr>
<th>Sno</th>
<th>Course</th>
<th>Total Marks</th>
<th>Mid Sem Exam*</th>
<th>Sem End Exam</th>
<th>Teaching Hours</th>
<th>Credits</th>
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<td>1</td>
<td>Skill Development Course – 2 (University’s Choice): <strong>Accounting Software</strong></td>
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<td>5.1</td>
<td>Hadoop &amp; R Language</td>
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|     | **Total** | 650 | | | 29 | 24 |
SKILLS BASED COURSE (UNIVERSITY CHOICE)

SBS G 6.1A ACCOUNTING SOFTWARE

Unit-I: Accounting Software Packages: Tally, Wings, Busy, Spreadsheet, Ms Excel as Accounting tool, Function wizard, Auditing Tool in MS Excel - Selective Applications for Accounts.


Unit-III: Applications of Spreadsheet Software: Preparation of Cash, Production and Flexible Budgets, Projected Profit & Loss Statement and Balance Sheet.

References:
1. Horngreen, C.T., Introduction to Management Accounting, Prentice Hall,
2. Smith, J.L. Keith, RM and Stephens, W.L., Managerial Accounting, McGraw Hill.
BCA III Year VI Semester

E-commerce

Course Objectives

1. To develop an understanding of scope of E-Commerce.
2. To develop an understanding of electronic market and market place.
3. To develop an understanding of business models.
4. To develop an understanding of legal issues, threats of E-Commerce.

Course Outcomes

1. Students would be able to analyze the concept of electronic market and market place.
2. Students would be able to understand the business models.
3. Students would be able to understand the business standards.
4. Students would be able to understand the legal and security issues.

Unit-I


Unit-II


Unit-III


Unit-IV


Unit-V

Application, Dotcom companies, The Indian scenario for E-Business, electronic business implementations, B2B E-commerce, B2C E-commerce, B2B Market Place...

References:


2. The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-based Business by Janice Reynolds


Student Activity:
1. Study the activities of any E-Commerce website and give suggestions to improve their business
2. Prepare your own E-commerce business site
Course Objective

This course provides an overview of the historical and modern context and operation of free and open source software (FOSS) communities and associated software projects. The practical objective of the course is to teach students how they can begin to participate in a FOSS project in order to contribute to and improve aspects of the software that they feel are wrong. Students will learn some important FOSS tools and techniques for contributing to projects and how to set up their own FOSS projects.

Course Outcomes

Ability to install and run open-source operating systems. Ability to gather information about Free and Open Source Software projects from software releases and from sites on the internet. Ability to build and modify one or more Free and Open Source Software packages. Ability to use a version control system and to interface with version control systems used by development communities. Ability to contribute software to and interact with Free and Open Source Software development projects.

UNIT-I

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources– Application of Open Sources.

UNIT-II


UNIT-III

OPEN SOURCE DATABASE: MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time– Sorting Query Results
UNIT-IV


UNIT-V


REFERENCE BOOKS:

1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002

Student Activity:

1. Suggest list of open source softwares for the commercial software you come across
BCA III Year VI Semester

Cloud Computing

Objectives:

1. Discuss, with confidence, what is cloud computing and what are key security and control considerations within cloud computing environments.
2. Identify various cloud services.
3. Assess cloud characteristics and service attributes, for compliance with enterprise objectives.
4. Explain the four primary cloud category "types".
5. Evaluate various cloud delivery models.
6. Contrast the risks and benefits of implementing cloud computing.
7. Specify security threat exposure within a cloud computing infrastructure.
8. Recognize steps and processes used to perform an audit assessment of a cloud computing environment.

Course Outcome:

1) Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing
2) Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost
3) Discuss system virtualization and outline its role in enabling the cloud computing system model
4) Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS
5) Analyze various cloud programming models and apply them to solve problems on the cloud

Unit I

Cloud Computing Overview – Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, Measured service

Unit II

Cloud scenarios – Benefits: scalability, simplicity, vendors, security.

Limitations – Sensitive information - Application development – Security concerns - privacy concern with a third party - security level of third party - security benefits

Regularity issues: Government policies
Unit III

Cloud architecture: Cloud delivery model – SPI framework, SPI evolution, SPI vs. traditional IT Model

Software as a Service (SaaS): SaaS service providers – Google App Engine, Salesforce.com and google platform – Benefits – Operational benefits - Economic benefits – Evaluating SaaS


Unit IV

Infrastructure as a Service (IaaS): IaaS service providers – Amazon EC2, GoGrid – Microsoft software implementation and support – Amazon EC service level agreement – Recent developments – Benefits

Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing

Unit V

Virtualization: Virtualization and cloud computing - Need of virtualization - cost, administration, fast deployment, reduce infrastructure cost - limitations

Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization

Desktop virtualization: Software virtualization – Memory virtualization - Storage virtualization – Data virtualization – Network virtualization

Microsoft Implementation: Microsoft Hyper V – VMware features and infrastructure – Virtual Box - Thin client

REFERENCES:


Student Activity:

1. Prepare a list of companies that provide different cloud services

2. Create your own cloud using a local server
BCA III Year VI Semester
Elective- I

Hadoop & R Language

Course Objectives

- Apply Data Mining and understand Decision Trees and Random Forests
- Master the concepts of Hadoop 2.7 framework and its deployment in a cluster environment
- Learn to write complex MapReduce programs
- Perform Data Analytics using Pig & Hive
- Acquire in-depth understanding of Hadoop Ecosystem including Flume, Apache Oozie workflow scheduler, etc.
- Master advance concepts of Hadoop 2.7: Hbase, Zookeeper, and Sqoop
- Get hands-on experience in setting up different configurations of Hadoop cluster
- Work on real-life industry based projects using Hadoop 2.7

Course Outcomes

Hadoop and R Language will prepare you to perform analytics and build models for real world data science problems. It is the world's most powerful programming language for statistical computing and graphics making it a must know language for the aspiring Data Scientists. 'R' wins strongly on Statistical Capability, Graphical capability, Cost and rich set of packages.

UNIT I

Introduction to BIG'Data ' & ' Hadoop Introduction to MapReduce ' & ' HDFS

UNIT II

The Hadoop MapReduce API & Algorithms. How to get started writing programs with Hadoop's API. Programming methodologies and paradigms in Map Reduce Beyond basics: The flow; APIs; Creating Input Formats and Output Formats; Driver; Mapper; Reducer; Streaming

UNIT III

Introduction to The'Hadoop'Ecosystem'Components An introduction to components surrounding Hadoop, which complete the greater ecosystem of available, processing tools.

UNIT IV

R overview, basic syntax, data types, variable, operators, decision making, loops, functions
UNIT V

String, vectors, list, matrices, data frames, reshaping, packages, graphics.

References:

Hadoop: The Definitive Guide By: Tom White
Hadoop in Practice (By: Alex Holmes)

Hadoop Operations (By: Eric Sammer ) Instant MapReduce Patterns - Hadoop Essentials How-to (By: Srinath Perera)

An Introduction to R: A Programming Environment for Data Analysis and Graphics Author(s) William N Venables, David M Smith.

The Art of R Programming: A Tour of Statistical Software Design Author(s) Norman Matloff
BCA III Year VI Semester
Elective- I

NETWORK PROGRAMMING

Course Objectives

1. To understand inter-process and inter-system communication
2. To understand socket programming in its entirety
3. To understand usage of TCP/UDP / Raw sockets
4. To understand how to build network applications

Course Outcomes

1. Analyze the security requirements of a networked programming environment and identify the issues to be solved;
2. come up with conceptual solutions to those issues;
3. implement a programming solution;
4. understand the key protocols that support the Internet;
5. be familiar with several common programming interfaces for network communication;
6. have a detailed knowledge of the TCP/UDP Sockets

UNIT I

INTRODUCTION: Overview of UNIX OS - Environment of a UNIX process - Process control - Process relationships Signals - Inter-process Communication- overview of TCP/IP protocols

UNIT II


UNIT III

UNIT IV


UNIT V


REFERENCES:
BCA III Year VI Semester
Elective- I

Cyber laws

Course Objectives: The objectives of this course is to:

1. Enable learners to understand, explore, and acquire a critical understanding of Cyber Law
2. Develop competencies for dealing with frauds and deceptions (confidence tricks, scams) and other cyber crimes for example, child pornography etc. that are taking place via the Internet.
3. Make learners conversant with the social and intellectual property issues emerging from ‘Cyberspace’.
4. Explore the legal and policy developments in various countries to regulate Cyberspace;
5. Develop the understanding of relationship between commerce and cyberspace; and give learners in depth knowledge of Information Technology Act and legal frame work of Right to Privacy, Data Security and Data Protection.

Course outcomes

At the end of the course, students should be able to:

1. Critically evaluate ongoing developments in law relating to information technologies
2. Display an understanding of how these developments relate to one another.
3. Examine areas of doctrinal and political debate surrounding rules and theories;
4. Evaluate those rules and theories in terms of internal coherence and practical outcomes;
5. Draw on the analysis and evaluation contained in primary and secondary sources

Unit I


Unit II

Unit III

**Constitutional & Human Rights Issues in Cyberspace:** Freedom of Speech and Expression in Cyberspace, Right to Access Cyberspace – Access to Internet, Right to Privacy, Right to Data Protection.

Unit IV

**Cyber Crimes & Legal Framework:** Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000.

Unit V

**Cyber Torts:** Cyber Defamation, Different Types of Civil Wrong under the IT Act, 2000, Intellectual Property Issues in Cyber Space, Interface with Copyright Law, Interface with Patent Law, Trade marks & Domain Names Related issues

**Reference Books**

BCA III Year VI Semester
Elective- II

Advanced Android

Course Objective

The objective is to help learners to create applications using Google's Android open-source platform. The course explains what Android is and how it compares to other mobile environments, the setup of the Android™ Eclipse-based development tools, the Android SDK, all essential features, as well as the advanced capabilities and APIs such as background services, accelerometers, graphics, and GPS.

Course Outcomes

1. Build your own Android apps
2. Explain the differences between Android and other mobile development environments
3. Understand how Android™ applications work, their life cycle, manifest, Intents, and using external resources
4. Design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
5. Take advantage of Android's APIs for data storage, retrieval, user preferences, files, databases, and content providers
6. Tap into location-based services, geo-coder, compass sensors, and create rich map-based applications
7. Utilize the power of background services, threads, and notifications.
8. Use Android's communication APIs for SMS, telephony, network management, and internet resources (HTTP).
9. Secure, tune, package, and deploy Android applications

Unit-I

Data Persistence: User Preferences, Persisting Data to Files, Using SQLite Databases

Unit-II
Messaging: SMS Messaging, Sending E-mail

Unit-III
Location-Based Services: Displaying Maps, Getting Location Data, Monitoring a Location, Building a Location Tracker
Unit-IV

Android Services: Create your Own Service, Communication between Services and Activity, Binding Activities to Services, Threading.

Unit-V

Exception Handling in Android: Handling Errors, Handling Exceptions Using Try, Catch and Finally
Publishing Android Application: Prepare for Publishing; Deploy APK Files, Publishing on the Android Market

Reference Books:

1. Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) By: Bill Philips & Brian Hardy
2. Android Design Patterns: Interaction design solutions for developers by Greg Nudelman
3. Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps By: Ian G. Clifton
4. Android Recipes: A Problem-Solution Approach By: Dave Smith & Jeff Friesen
6. Beginning Android Games By: Mario Zechner
BCA III Year VI Semester
Elective- II
Design of Video Games

Course Objectives

1. Discuss and define the terms and principles of game design and development.
2. Select and evaluate programming and scripting languages to develop particular games.
3. Define the structure and duties of the game development team.
4. Practice animation production and creation tools.
5. Apply the mathematics used in game design.
6. Apply the physics needed to design computer games.
7. Apply artificial intelligence to developing computer games.

Course Outcomes

After completing this course, students will be able to understand all game development problems and issues, such as story creation, selection of programming language, mathematical analysis, physical analysis, graphics, multimedia, artificial intelligence, and others.

UNIT I

History of video games, game genres, The games industry, Theory of funativity: what is fun?

UNIT II

Game design teams and processes, Level design, Modeling

UNIT III

Human-computer interaction (HCI) & interface design, Computer graphics, collision detection, lighting, and animation

UNIT IV

Game scripting and programming, Game data structures and algorithms

UNIT V

Artificial intelligence, Play testing
Reference Books


2. Game Development Essentials: An Introduction. 3rd Edition

3. A Theory of Fun for Game Design, by Koster

4. Understanding Comics: The Invisible Art, by McCloud
BCA III Year VI Semester
Elective- II

Advanced software Testing

Course Objectives
The Objective of this course is to learn and apply basic skills needed to create and automate the test plan of a software project, to know how to plan, develop, and execute an automated test plan. Students should learn testing concepts, Test planning, Creating a test plan in Test Director, Breaking the test plan into manageable components, Designing test cases and test steps, Analyzing the test plan, Developing Win Runner automated test scripts, Creating a script through recording, Synchronizing the test, Adding verification of GUI objects, bitmaps and text, and Managing the GUI map.

Course Outcomes:
1 To be able to apply various test processes and continuous quality improvement
2 To be able to define the types of errors and fault models
3 To be able to use methods of test generation from requirements
4 To be able to use UML.
5 To be able to Test generation from FSM models

Unit-I

Unit-II
Testing Processes: Processes in General, Test Planning and Control, Test Analysis and Design, Test Implementation and Execution, Evaluating Exit Criteria and Reporting, Test Closure

Unit-III
Test Management: Business Value of Testing, Test Management Documentation, Test Estimation, Test Progress Monitoring and Control, Testing and Risk,

Unit-IV
Test Techniques: Specification-Based Techniques, Structure-Based Techniques, Defect-Based Techniques, Experience-Based Testing Techniques, Static Analysis, Dynamic Analysis, Choosing Testing Techniques,

Unit-V


References:
PROJECT & VIVA-VOCE

The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

The project is of 2 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The Project work should be either an individual one or a group of not more than three members 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.
VI Semester B.C.A. Model Paper
E-Commerce

Time: 3 Hrs

Max Marks: 75

Answer any FIVE from the following. Each question carries 15 Marks.

1. Briefly discuss about Functions of E-Commerce and also explain how the E-Commerce is different from Traditional Commerce.

2. a) Discuss about Scope of the E-Commerce
   b) Explain about Functions of E-Commerce

3. a) Explain about Technical Architecture of E-Commerce.
   b) Discuss about Benefits of E-Commerce.


5. a) Discuss about different E-Commerce Models.
   b) Explain about dotcom companies.

6. a) Discuss about International E-Commerce
   b) List out different E-Commerce Applications

7. Briefly explain about E-Cash and E-Market

8. a) Explain about different issues in On line Purchasing
   b) Discuss about On Line Shopping.

9. Discuss about
   a) Credit Card    b) Debit Card    c) B2B Hibs

10. Discuss about
    a) Indian Scenario for E-Commerce
    b) AMR Model for Electronic Business

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VI Semester B.C.A. Model Paper
Open Source Software

Time: 3 Hrs  Max Marks: 75

Answer any FIVE from the following. Each question carries 15 Marks.

1. Discuss about need for Open Source Software.
2. Explain about advantages of Open Source Software.
3. Explain about
   a) Kernal Mode Operations
   b) User Mode Operations
4. Briefly explain about Cloning with the help of an Example.
5. a) Write a query to fetch the largest salaried person in a department.
     b) Write a query to group the list of jobs in a company.
     c) Create Table with following specifications
        S(SNO, SNAME,CITY,STAUS)
        P(PNO,PNAME,CLR)
        SP(SNO,PNO,QTY)
6. a) Explain about Data Functions with help of a example.
7. Discuss about working of Arrays in PHP with an example.
8. What is Function? Develop an PHP Function to calculate the factorial of a
given number.
9. Explain about procedure to construct packages in PERL.
10. Briefly explain about File Accessing modes in PERL.

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VI Semester B.C.A. Model Paper
Cloud Computing

Time: 3 Hrs Max Marks: 75

Answer any FIVE from the following. Each question carries 15 Marks.

1. a) Discuss about Business on Demand.
   b) What are the essential characteristics of Cloud Computing?
2. Explain about
   a) Load Balancing    b) QoS
3. Discuss in detail about Cloud Scenarios
4. Explain different issues to concern while establishing the Cloud Computing Environment
5. Discuss about functionality of Google App Engine and its benefits.
7. a) Explain about Amazon E2 Services
   b) Discuss about benefits of IaaS and SaaS.
8. Differentiate Public Cloud, Private Cloud and Hybrid Cloud.
9. Explain about Virtualization and different kinds of Virtualization.
10. Explain about features of Microsoft Hyper V

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VI Semester B.C.A. Model Paper
Elective – I: Hadoop and R Language

Time: 3 Hrs
Max Marks: 75

Answer any FIVE from the following. Each question carries 15 Marks.

1. a) Explain about Four V's of Big Data.

   b) Briefly explain about different kinds of data stored in Big Data.

2. What is HDFS? List out the features of HDFS.

3. Discuss about steps involved in finding the number of words in given text using Map Reduce.

4. a) Explain about Name Node, Data Node and Secondary Node in Hadoop.

   b) Discuss, how Hadoop can full fill the challenges of Big Data.

5. Explain about architecture of HBase.

6. Briefly explain about different categories of data types used in Hadoop.

7. a) Write a R-Program to concatenate two strings.

    b) Discuss about working of Data Frames in R

8. a) Discuss about Group Expressions with help of example.

    b) Briefly explain about procedure to illustrate the functionality of loops in R

9. a) Write a procedure to generate multiple graphs with in a single window.

    b) Explain about matrix plots.

10. Discuss about exporting graph.

    * * * * *
Answer any FIVE from the following. Each question carries 15 Marks.

1. a) Discuss about possible actions in handling a signal.
   b) Discuss about any five signals

2. With the help of a neat diagram, discuss about environment of Unix.

3. What is Concurrent server? Discuss about status of client and server after each function used in Concurrent Server.

4. Explain different socket conversion functions.

5. Discuss about various I/O models and differentiate them.

6. Write the syntax for select function and explain various arguments.

7. What is Domain Name? Explain its importance and how, DNS Server maintains and resolves the domain names.

8. Discuss about UDP and TCP Sockets.

9. a) Write a short notes on TCP echo servers
    b) Explain in detail about thread servers

10. Discuss about implementation of Trace Route.
VI Semester B.C.A. Model Paper
Elective – I: Cyber Laws

Time: 3 Hrs Max Marks: 75

Answer any FIVE from the following. Each question carries 15 Marks.

2. Discuss about Jurisprudence of Indian Cyber Law.
3. a) Discuss about Budapest Convention for Cyber Crime.
    b) Explain about International Cyber Laws
4. Explain about APEC.
5. Discuss about issues in Cyber Space.
6. Explain various possibilities of Cyber Crimes may appear and also discuss about rules to handle those crimes.
7. Discuss about different offense under IT Act, 2000.
8. Explain about Cyber Defamation and issues on Defamation.
9. a) Discuss about Copyright Law
    b) Explain about issues related to Domain Names.
10. Explain about Cyber Terrorism.

** * * * *
Answer any FIVE from the following. Each question carries 15 Marks.

1. Discuss about File based Persistence?
2. Explain in detail about working of SQLite Database.
3. Discuss about procedure to send text messages to your email using Adroid App.
4. Develop an Android App service to identify the last Known Locations.
5. Explain about the procedure to display the Maps in a App.
6. Discuss about threading.
7. Explain about android Services.
8. What is Exception Handling? Discuss about procedure to handle the exceptions in Android.
9. Explain about APK Files.
10. Develop a Android application to evaluate the login credentials as the following conditions
    a) Password should be at least 8 characters
    b) First character should be Upper Letter
    c) At least one special character other than "@"
Answer any FIVE from the following. Each question carries 15 Marks.

1. Discuss about precautions to take while developing Video Games.
2. Explain about
   a) Social Fun
   b) Physical Fun
3. Discuss about different sections of Game Design Document.
4. a) What is Script in Game Design.
   b) Explain about Morphing.
5. What is the role HCI in Game development?
7. Explain about typical data structures used in Game Development.
8. a) List out different Programming Languages used in Game Development.
   b) Write an algorithm to generate a transformation of an object.
9. What is the role of Artificial Intelligence in construction of a Game?
10. What are the benefits of Video Games?
Answer any FIVE from the following. Each question carries 15 Marks.

1. Discuss about different phases of Software Testing Life Cycle.

2. What is the difference between a Waterfall Development Model and a V-Model.

3. a) What is a Work Breakdown Structure?
   b) Why should test entry criteria be checked?

4. a) What are the activities in the test closure process?
   b) Why should test ware be kept?

5. Discuss in detail about Risk Management?

6. a) What is Product Reliability?
   b) Explain about Delphi Testing.

7. Explain briefly about different defect based Testing Techniques

8. What is Dynamic Analysis, explain.

9. Discuss about attributes of quality testing?

10. a) Explain about Decision Table based Testing.
    b) What do we need to be aware of concerning accuracy testing?