

SEMESTER V

S.No	Course	Total Marks	Mid Sem Exam	Sem End Exam	Teaching Hours	Credits
1	Foundation Course Subject Seminar	50	0	50	2	2
2	Software Engineering	100	25	75	4	3
3	Software Engineering Lab	50	0	50	2	2
4	Web Programming	100	25	75	4	3
5	Web Programming Lab	50	0	50	2	2
6	Mini Project	100	0	100	6	5
7	ELECTIVE - I 1. Data Mining & Ware Housing (or) 2. Computer Forensics	100	25	75	6	5
8	ELECTIVE - II 1. Computer Networks (or) 2. Principles of Animation	100	25	75	6	5
9	ELECTIVE- III 1. Android Basics (or) 2. Software Testing Methodologies	100	25	75	6	5
Total		750			38	32

III YEAR V SEMESTER

Software Engineering

Course Objectives

The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course outcomes

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

UNIT I

INTRODUCTION: Software Engineering Process paradigms - Project management - Process and Project Metrics – software estimation - Empirical estimation models – Planning.

UNIT II

REQUIREMENTS ANALYSIS: Requirement Engineering Processes – Feasibility Study – Problem of Requirements – Software Requirement Analysis – Analysis Concepts and Principles – Analysis Process – Analysis Model

UNIT III

SOFTWARE DESIGN:Software design - Abstraction - Modularity - Software Architecture - Effective modular design - Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT IV

USER INTERFACE DESIGN AND REAL TIME SYSTEMS :User interface design - Human factors - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards.

UNIT V

SOFTWARE QUALITY AND TESTING :Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing.

REFERENCE BOOKS:

1. Roger Pressman S., "Software Engineering: A Practitioner's Approach", 7th Edition, McGraw Hill, 2010.
2. Software Engineering Principles and Practice by Deepak Jain, Oxford University Press
3. Sommerville, "Software Engineering", Eighth Edition, Pearson Education, 2007
4. Pfleeger, "Software Engineering-Theory & Practice", 3rd Edition, Pearson Education, 2009
5. Carlo Ghazi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals of Software Engineering", Pearson Education, 2003

Student Activity:

1. Develop requirement analysis report to develop software for any financial organization
2. Develop risk analysis report for any organization using software for its day to day transactions

SOFTWARE ENGINEERING - LAB

1. To Develop model for Student Result Management System
2. To Develop model for Library management system
3. To Develop model for Inventory control system
4. To Develop model for Accounting system
5. To Develop model for Fast food billing system
6. To Develop model for Bank loan system
7. To Develop model for Blood bank system
8. To Develop model for Railway reservation system
9. To Develop model for Automatic teller machine
10. To Develop model for Video library management system
11. To Develop model for Hotel management system
12. To Develop model for Hostel management system
13. To Develop model for E-ticking

WEB PROGRAMMING

Course Objective

- To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
- To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of .NET Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

UNIT I

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

UNIT II

Introduction to Web Technology: Web pages – Introduction to HTML, XML - Basic HTML, The Document body, Text, Hyperlinks, adding more formatting - Lists, Tables, Using colors and images, Images. - Multimedia objects, Frames, Forms-towards interactivity, document Head in detail, - Overview of DHTML – Common Gateway Interface.

UNIT III

Introduction to the Style Sheets and Java Scripts: Cascading Style Sheets: Introduction, Using styles: Simple examples, Defining your own styles, Properties and values in styles, Style sheets- A worked example, Formatting blocks of information, Layers. An introduction to Java Script: What is dynamic html, Java Script, JavaScript—The basics, Variables, String manipulation, Mathematical functions, Statements, Operators, Arrays, Functions.

UNIT IV

ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages - Active Web Pages in better solution

UNIT V

XML: Defining Data for Web applications - Basics of XML, Document type definition, XML schema, Document Object Model, Presenting XML.

Books for Reference:

1. Paul S.Wang Sanda S. Katila, An Introduction to Web Design Plus Programming, Thomson, 2007.
2. Robert W.Sebesta, Programming the World Wide Web, Third Edition, Pearson Education, 2007.
3. Thomas A.Powell, The Complete Reference HTML & XHTML, Fourth Edition, Tata McGraw Hill, 2006.
4. Abders Moller and Michael Schwartzbach, An Introduction to XML and Web Technologies, Addison Wesley , 2006.
5. Joel Sklar, Principles of Web Design, Thomson, 2007.
6. Raj Kamal, Internet and Web Technologies, Tata McGraw Hill, 2007.

Student Activity:

1. Design a website for your college
2. Design your personal web site

WEB PROGRAMMING LAB

1. Create a simple HTML page which demonstrates all types of lists.
2. Create a letter head of your college using following styles
 - i. image as background
 - ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page; these web pages must contain with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using row span and colspan.

RNO	NAME	MARKS				
		M1	M2	M3	M4	M5

Insert 5 records.

7. Create a table with different formats as given bellow.
 - i. Give different background and font colors to table header, footer and body.
 - ii. Use table caption tag.
8. Divide a web page vertically and horizontally with scroll bars, name them as shown bellow decorate it with some items.

F1	F2
	F3

9. Create a student Bio-Data, using forms.
10. Create a web page using following style sheets
 - i. Inline style sheets.
 - ii. Embedded style sheets.
 - iii. External style sheets
11. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions

Write student database with XML

BCA III Year V Semester

ELECTIVE - I: Data mining & Ware Housing

Course Objectives

The Objective of this course is to understand data mining principles and techniques: Introduce DM as a cutting edge business intelligence method and acquaint the students with the DM techniques for building competitive advantage through proactive analysis, predictive modeling, and identifying new trends and behaviors. Develop and apply critical thinking, problem-solving, and decision-making skills

Course Outcomes

1. Examine the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
2. Apply preprocessing statistical methods for any given raw data
3. Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems , make predictions of outcomes
4. Comprehend the roles that data mining plays in various fields and manipulate different data mining techniques
5. Select and apply proper data mining algorithms to build analytical applications.
6. Evaluate and implement a wide range of emerging and newly-adopted methodologies and technologies to facilitate the knowledge discovery.

Unit I

Introduction to Data Mining, Fundamentals of data mining, data mining functionalities, data and attribute types, statistical description of data.

Data Preprocessing:

Data cleaning, data integration, data reduction, data transformation and data discretization.

Unit II

Data Warehousing: Basic concepts, data ware house modeling data cube and OLAP, data warehouse design and implementation.

Unit III

Mining Frequent Patterns and Associations: Basic methods, frequent Item set mining methods any two algorithms, pattern evaluation methods.

Unit IV

Classification: Basic concepts, decision tree induction, Bayes classification, any two advanced methods, model evaluation.

Unit V

Cluster Analysis: Basic concepts, clustering structures, major clustering approaches, partitioning methods, hierarchical methods, density based methods, the expectation maximization method, cluster based outlier detection Essential Reading.

References:

1. 1.Data Mining by Vikram Pudi, P.Radha Krishna, Oxford University Press
2. Data Warehousing by Reema Thareja , Oxford University Press
3. 1.J. Han , M. Kamber and J. Pei , Data Mining: Concepts and Techniques , 3rd.edMorgan Kaufmann, 2011
4. Introduction to data mining –G.K.Gupta, PHI
5. 3.Data mining, Data warehouse & Olap-Berson, Tata McGraw Hill

Student Activity:

- 1.Predict the course taken by a student based on his activities and way of learning
2. Learn visual patterns of any real time data

BCA III Year V Semester

ELECTIVE - I: Computer Forensics

Course Objectives

- Explain the responsibilities and liabilities of a computer forensic investigator
- Plan and prepare for an incident requiring computer forensic skills
- Seize a computer from a crime scene without damaging it or risking it becoming inadmissible in a court of law
- Explain where digital evidence resides on computer storage devices
- Hire experts to perform detailed forensic analysis and expert testimony

Course Outcomes

1. understand the role of computer forensics in the business and private world
2. identify some of the current techniques and tools for forensic examinations
3. describe and identify basic principles of good professional practice for a forensic computing practitioner
4. Apply forensic tools in different situations.

Unit I

Introduction to Computer Forensics : Computer forensics definitions ,Computers' roles in crimes ,Computer forensics tasks ,Prepare for an investigation, Collect evidence ,Preserve evidence ,Recover evidence, Document evidence Challenges associated with making "cybercrime" laws, Jurisdictional issues.

Unit II

Computer Crimes :Crimes ,Violent crimes where computers are used include terrorism, assault threat, stalking, child pornography ,Nonviolent crimes where computers are used include trespass, theft, fraud, vandalism , Where evidence often resides for different types of crimes ,Address books, chat logs, e-mail, images, movies, Internet browser history, etc.

Unit III

Computer Criminals: Using evidence to create a crime timeline , Modify Access Create (MAC) dates associated with files ,Problems with using these (they don't change in a logical fashion in some cases) ,Criminals and crime fighters ,Understanding "cyber criminals" and their victims ,Understanding "cyber investigators.

Unit IV

Building a Cybercrime Case: Bodies of law ,Constitutional law ,Criminal law ,Civil law ,Administrative regulations ,Levels of law ,Local laws ,State laws ,Federal laws ,International

laws ,Levels of culpability ,Intent ,Knowledge ,Recklessness ,Negligence , Level and burden of proof ,Criminal versus civil cases ,Vicarious liability ,Laws related to computers ,CFAA, DMCA, CAN Spam, etc.

Unit V

Preserving and Recovering Digital Evidence: Disk imaging ,Creating a message digest or hash code for a disk ,Where data hides; deleted and erased data ,File systems ,Files ,Modify Access Create (MAC) dates to establish time line ,File headers - info about file type

References books

1. Guide to Computer Forensics and Investigations ,By Bill Nelson, Amelia Phillips, christopher Steuart
2. Scene of the Cybercrime, by Debra Littlejohn Shinder.
3. John R. Vacca, Computer Forensics: Computer Crime Scene Investigation, 2nd Edition, Charles River Media, 2005
4. Christof Paar, Jan Pelzl, Understanding Cryptography: A Textbook for Students and Practitioners, 2 nd Edition, Springer's, 2010
- 5 . Ali Jahangiri, Live Hacking: The Ultimate Guide to Hacking Techniques & Countermeasures for Ethical Hackers & IT Security Experts, Ali Jahangiri, 2009
6. Computer Forensics: Investigating Network Intrusions and Cyber Crime (Ec-Council Press Series: Computer Forensics), 2010

Student Activity:

1. Collect calls made from a cell tower and analyze them
2. Trace the IP address of the machine from which you received a email

BCA III Year V Semester

ELECTIVE II: Computer Networks

Course Objectives

1. To provide an introduction to the fundamental concepts on data communication and the design of computer networks.
2. To get familiarized with the basic protocols of computer networks.

Course Outcomes

After this course, the student will be able to

1. Identify the different components in a Communication System and their respective roles.
2. Describe the technical issues related to the local Area Networks
3. Identify the common technologies available in establishing LAN infrastructure.

UNIT I

Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control.

UNIT II

Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and switches

UNIT III

Circuit switching vs. packet switching / Packet switched networks – IP – ARP – RARP – DHCP – ICMP – Queueing discipline – Routing algorithms – RIP – OSPF – Subnetting – CIDR – Interdomain routing – BGP – Ipv6 – Multicasting – Congestion avoidance in network layer

UNIT IV

UDP – TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – Congestion avoidance – QoS

UNIT V

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP - SSH

REFERENCE BOOKS:

1. Andrew S. Tanenbaum, “Computer Networks”, Fourth Edition, 2003
2. Computer Networks by Bhushan Trivedi, Oxford University Press
3. James F. Kuross, Keith W. Ross, “Computer Networking, A Top-Down Approach

Featuring the Internet”, Third Edition, Addison Wesley, 2004.

4.Nader F. Mir, “Computer and Communication Networks”, Pearson Education, 2007

5.Comer, “Computer Networks and Internets with Internet Applications”, Fourth Edition, Pearson Education, 2003.

6. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson vi, 2000

Student Activity:

1. Learn the functioning of various network devices used in your college network
2. Compare 2G,3G,4G and 5G networks
3. Prepare LAN deployment diagram of your organization

BCA III Year V Semester
ELECTIVE - II : Principles of Animation

Course Objectives

Students can expect to learn basic principles and relevant techniques for comprehending the underlying

Course Outcome

- Understanding of the key principles of animation.
- Understanding of the concept of timing for animation and its application as a means of communication.
- Ability to creatively manipulate frame time as a means of emphasizing and actualizing action and expressing an idea.

UNIT-I

What is Animation: Its definition, early examples of Animation. History of Animation: Stop Motion Photo Animation, Zoetrope, Thaumatrope, Cell and Paper Animation, early Disney's Cell Animation Processes

UNIT-II

Types of Animation: Cell Animation, Stop Motion Animation, Computer Animation, 2-D Animation, 3-D Animation. Skills for an Animation Artist: Visual and creative development of an Artist, importance of observation with minute details, efficiency to draw gestures, facial expressions, good listener, hard work and patience, creative and innovative.

UNIT-III

Basic Principles of Animation: Illusion of Life, straight action and pose to pose Timing, Exaggeration, Drama and Psychological Effect, Fade in and Fade out, Squash and Stretch, Anticipation, staging, follow through and overlapping action, Arcs, Solid Drawing, Appeal, slow in and slow out, Secondary Action.

UNIT-IV

An Introduction on how to make drawings for animation, Shapes and forms, About 2d and 3d drawings, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary-breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

UNIT - V

Various Terms: Animation Drawings/Cels, Rough Drawings, Clean ups, Color reference drawings, Layout, Model Sheet, Key Drawings and in Betweens, Master Background, Concept Piece, Character drawing, Story Board.

References:

- 1.The complete animation course by Chris Patmore -Baron's Educational Series.(New York)
2. Animation Unleashed by Ellen Bessen, Michael Weise Productions,2008(U.S.A)
- 3.The Animator's Survival Kit by Richard Williams, Arrar Straus & Giroux Pub.(U.S.A

Student Activity:

1. Develop a simple animated short film
2. Develop a simple animated short film with back ground music

BCA III Year V Semester
ELECTIVE -III : Android Basics

Course Objectives:

1. Describe the platforms upon which the Android operating system will run.
2. Create a simple application that runs under the Android operating system.
3. Access and work with the Android file system.
4. Create an application that uses multimedia under the Android operating system.
5. Access and work with databases under the Android operating system.

Course Outcomes

After completion of this course students should make Android apps for Android devices. Students will be able to write simple GUI applications, use built-in widgets and components, work with the database to store data locally, and much more.

UNIT-I

What is Android, Android Tools, Your First Android Application, Anatomy of Android Application, Workspaces, Editors in Eclipse, Eclipse Perspective, Refactoring

UNIT-II

Creating Android Emulator, Creating Snapshot, SD Card Emulation, Sending SMS Messages to the Emulator, Transferring Files into and out of the Emulator, Resetting the Emulator

UNIT-III

Activity, Linking Activity using Intent, Fragments, Calling Build-In Application using Intent, Notifications

UNIT-IV

Components of a Screen, Display Orientation, Action Bar, Listening for User Inter

UNIT-V

Basic Views, Picker Views, List View, Specialized Fragment, Gallery and Image View, Image Switcher, Grid View, Options Menu, Context Menu, Clock View, Web view

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
5. Hello, Android: Introducing Google's Mobile Development Platform (Pragmatic Programmers) By: Ed Burnette

Student Activity:

- 1. Create a mobile APP for your college**
- 2. Create a mobile APP for any rural application**

BCA III Year V Semester

ELECTIVE -III : SOFTWARE TESTING METHODOLOGIES

Course Objectives

The Objective of this course is to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. We can learn strengths and weaknesses of a variety of software testing techniques.

Course Outcomes

After completion of this course the student will be able to plan, develop, and execute an automated test plan.

UNIT-I

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of Bugs.

Flow Graphs and Path testing: Basics concepts of path testing, predicates, path predicates and Achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II

Transaction Flow Testing: Transaction flow, transaction flow testing techniques.

Dataflow testing: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-III

Domain Testing: domains and paths, Nice & ugly domains, domain testing domains and interfaces Testing, domain and interface testing, domains and testability.

UNIT-IV

Paths, Path products and Regular Expressions: Path products & path expression, reduction procedure, Applications, regular expressions & flow anomaly detection.

Logic Based Testing: Overview, decision tables, path expressions kv charts, specifications.

UNIT-V

State, State Graphs and Transition testing: State graphs, good & bad state graphs state testing, Testability tips.

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, Node reduction algorithm, building tools. (Student should be given an exposure to a tool like J Meter or Win runner.)

Reference Books

1. Software Testing techniques –Baris Beizerm Dreamtech, Second edition.
2. Software Testing Tools – Dr. K.V.K.K. Prasad, Dreamtech.
3. Software Testing Principles and Practices by Naresh Chauhan, Oxford University Press
3. The craft of software testing – Brain Matrick, Pearson Education.
4. Software Testing Techniques – SPD (Oreille)
5. Software Testing in the Real World-Edward Kit, Pearson.
6. Effective methods of Software Testing, Peery, John Wiley.
7. Art of Software Testing – Meyers, John Wiley.

Student Activity:

1. Prepare a chart for guidelines for data security in your organization
2. Test the performance of any software that is used by your organization under maximum load