

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Software Testing
Course Code:	16-CAM311-3C
Pre-requisite Course:	Introduction to Programming, Software Engineering, Database Management Systems (DBMS), and Object-Oriented Programming (OOP).

Course Objective (CO):

This course is intended to make the students:

- To understand the fundamental concepts of software testing, its principles, and the importance of testing in the software development lifecycle (SDLC).
- To develop proficiency in different testing techniques, such as black-box testing and white-box testing, and their role in test case design.
- To understand defect management processes, including defect life cycle, root cause analysis, bug tracking, and the role of testing in quality assurance.
- To learn about testing metrics and how they contribute to quality measurement in software development.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	--	--	4	50	50	--	--	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction to Software Testing : Definition and Importance of Software Testing, Software Testing Principles, Security and Performance Testing in SDLC and Testing Lifecycle, Types of Software Testing: Manual and Automation, Overview of Testing Levels: Unit Testing, Integration Testing, System Testing, and Acceptance Testing.	10	20
2.	Testing Techniques and Test Case Design: Black Box Testing Techniques: Boundary Value Analysis, Equivalence Partitioning, White Box Testing Techniques: Statement, Branch, and Path Coverage, Gray Box Testing, Test Case Design and Writing, Test Data Selection and Preparation.	10	20
3.	Software Testing Tools and Automation: Overview of Automation in Testing, Introduction to Popular Testing Tools (e.g., Selenium, JUnit, TestNG), Functional Testing Tools and Usage, Performance Testing Tools (e.g., JMeter), Advantages and Limitations of Automation Tools.	10	20
4.	Defect Management and Quality Assurance: Defect Life Cycle and Reporting, Root Cause Analysis and Bug Tracking, Testing Metrics and Measurement, Role of Testing in Quality Assurance, Importance of Documentation in Testing.	09	20
5.	Advanced Topics and Trends in Software Testing : Agile Testing and Continuous Integration , Exploratory Testing and Ad-hoc Testing , Testing in DevOps Environment , Mobile Application Testing, Emerging Trends: AI in Testing, Cloud Testing.	09	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 : Understand the fundamental concepts of software testing,
- CLO.2 : Differentiate between various levels and types of software testing, including manual and automated testing approaches.

- CLO.3 : Apply black-box and white-box testing techniques to design effective test cases and select appropriate test data.
- CLO.4 : Understand defect management processes, including defect life cycle, root cause analysis, and the importance of testing metrics in quality assurance.
- CLO.5 : Analyze advanced testing trends and techniques such as Agile Testing, DevOps testing practices, and mobile application testing.
- CLO.6 : Explore the impact of emerging technologies like AI and cloud computing in enhancing software testing processes.

List of Text Book:

1. "Software Testing: Principles and Practices" by Srinivasan Desikan and Gopalaswamy Ramesh.
2. "Foundations of Software Testing" by Dorothy Graham, Erik van Veenendaal, Isabel Evans, and Rex Black.
3. "Software Testing Techniques" by Boris Beizer.
4. "Software Quality Assurance: From Theory to Implementation" by Daniel Galin

List of Reference Book:

1. "Software Testing and Quality Assurance: Theory and Practice" by Kshirasagar Naik and Priyadarshi Tripathy.
2. "Effective Software Testing: 50 Specific Ways to Improve Your Testing" by Elfriede Dustin.
3. "The Art of Software Testing" by Glenford J. Myers, Corey Sandler, and Tom Badgett.
4. "Performance Testing with JMeter" by Bayo Erinle.
5. "Experiences of Test Automation: Case Studies of Software Test Automation" by Dorothy Graham and Mark Fewster.

E-Resource / Web Links:

- Software Testing Tutorial – GeeksforGeeks , https://www.geeksforgeeks.org/software-testing-tutorial/?utm_source=chatgpt.com
- Software Testing Tutorial – Tutorialspoint , https://www.tutorialspoint.com/software_testing/index.htm?utm_source=chatgpt.com
- Software Testing Tutorial - Guru99, https://www.guru99.com/software-testing.html?utm_source=chatgpt.com
- Software Testing Fundamentals - Microsoft Learn , https://learn.microsoft.com/en-us/shows/software-testing-fundamentals/?utm_source=chatgpt.com

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1				H	H		M						L		
CLO2	H			H	H		M			M	M		M	L	M
CLO3				M	H								M		
CLO4	H				H								M		
CLO5				H	H	H	M	M	M		H		M	M	H
CLO6				H	H	H	M	M	M		H		M	M	H

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Data Warehousing and Data Mining
Course Code:	16-CAM312-3C
Pre-requisite Course:	Basic Knowledge of DBMS

Course Objective (CO):

This course is intended to make the students:

- Student will be enabled to learn basics of Data Warehouse fundamentals and Information Search techniques using data mining. Students are expected to understand database management and large size data warehousing methods.
- Student will also learn various data mining search techniques and need of data mart over DBMS, database and data warehouse. Student will also learn various OLAP technologies which make student capable of handling huge information.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	--	--	4	50	50	--	--	100

Course Contents:

Sr. No.	Topics	Total Hours	Weightage (%)
1.	Data Warehouse: An Overview, Architectural, Prospective and Modeling: Definition, Usage and trends, DBMS V/S Data Warehouse, Data Mart, Data Warehouse, Process and Architecture, Characteristics of Data Warehouse, Need for Data Warehouse, Basic Elements of Data Warehouse, Basic Principles of Data warehousing Modeling, User Requirements, Requirement Modeling, Temporal Data Modeling, Temporal Data Modeling Style	10	20
2.	Multidimensional Data Modeling an Overview, Usage Serve, Metadata: Multidimensional Data Model, Schema for Multidimensional Database: Star and Snowflake Model, MDDM Base Concepts, Requirement Analysis Using MDDM, Geographical Information System and Relational Database, DB2 Spatial Extender, OLAP V/S OLTP, ROLAP V/S MOLAP, Types of OLAP server, Metadata: Types of Metadata, Source of Metadata.	10	20
3.	Introduction to Data Mining : Importance of Data Mining, Data Mining Functionalities, Classification of Data mining systems, Data mining Architecture, Major Issues in Data Mining, Applications of Data Mining, Social impacts of data mining	10	20
4.	Data Mining: Data mining as process and Functionality, KDD V/S Data mining, Discovery V/S Verification Mode. Data Mining Techniques: Classification, Association Detection, Sequential Pattern Detection, Automatic Cluster Detection, Similar Time Sequence Detection.	9	20
5.	Advanced Topics, Trends and Web Mining: Mining Complex Data Objects: Spatial Mining, Temporal Mining, Multimedia database, Web content mining, Web Structure and usage mining, Data Generalization and summarization, Mining Class Comparison and Characterization	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 : Understand the fundamental concepts of data warehousing
- CLO.2 : Apply multidimensional data modeling techniques
- CLO.3 : Explore and understand data mining fundamentals
- CLO.4 : Implement data mining processes and techniques
- CLO.5 : Analyze advanced data mining topics and trends

List of Text Book:

1. Data Warehousing Fundamentals for IT Professionals" by Paulraj Ponniah , Wiley Publisher.
2. The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling" by Ralph Kimball and Margy Ross , Wiley Publisher.
3. Data Mining: Concepts and Techniques" by Jiawei Han, Micheline Kamber, and Jian Pei , Elsevier Publisher.
4. Introduction to Data Mining" by Pang-Ning Tan, Michael Steinbach, and Vipin Kumar , Pearson Publisher.

List of Reference Book:

1. "The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling" by Ralph Kimball and Margy Ross.
2. "Building the Data Warehouse" by W.H. Inmon.
3. "Data Warehousing Fundamentals for IT Professionals" by Paulraj Ponniah.
4. "Mastering Data Warehouse Design: Relational and Dimensional Techniques" by Claudia Imhoff, Nicholas Gallemmo, and Jonathan G. Geiger.

E-Resource / Web Links:

- https://www.tutorialspoint.com/dwh/dwh_data_warehousing.html
- <https://www.w3resource.com/slides/data-warehousing.php>
- <https://www.slideshare.net/obieefans/data-warehouse-concepts-8164443>
- https://www.tutorialspoint.com/data_mining/
- www.wideskills.com/data-mining-tutorial/data-mining-architecture

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L		M	M	L		M	M			M		L		
CLO2	L	M		H	M	M	M		M	M			L		
CLO3			L	M	M	M	L	M			L	L		M	
CLO4		M	M	L		H	M	L	M	L			M	M	
CLO5	L		M	L	M	H	M		M		L	L	M	M	

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	E-Commerce
Course Code:	16-CAM313-3C
Pre-requisite Course:	Basic knowledge of E-Commerce

Course Objective (CO):

This course is intended to make the students:

- Understand the basic concepts and models of eCommerce.
- Understand the infrastructure and technologies used in eCommerce.
- Analyze the role of data analytics and business intelligence in eCommerce.
- Understand the financial aspects of eCommerce
- Identify the challenges and opportunities in running an eCommerce business
- Understand the impact of eCommerce on society, culture, and the environment.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	-	4	50	50	-	-	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Introduction to E-commerce Unique Features of E-Commerce Technology, Types of Ecommerce (Business-to-Consumer(B2C), Business-to-Business(B2B), Consumer-to- Consumer(C2C), Mobile-Commerce (M-commerce),Social-E-commerce, Local-ECommerce), E-commerce History, Understanding e-Commerce (Technology and Business)	4	20
2.	Building an E-commerce Web Site: A systematic Approach, Choosing Software, Choosing Hardware, Other E-commerce site tools, Developing a mobile website and building mobile application	4	20
3.	E-commerce Security: The E-commerce security environment, Security threats in the e-commerce environment, Technology solutions, Management policies, Business procedures, and public laws, E-commerce Payment: E-commerce Payment system(Online credit card transaction, Online stored value systems, Mobile Payment Systems: your Smartphone Wallet, Digital Cash and Virtual Currencies), Electronic billing presentment and payment	4	25
4.	E-commerce Business Strategy : E-commerce business Models, Major Business-to-Consumer (B2C) Business Model, Major Business-to-Business(B2B) Business Model, How E-commerce changes business Strategy, Structure and Process Marketing Concepts: Introduction to Social, Mobile and Local Marketing, Social Marketing, Mobile Marketing, Local and Location based Mobile Marketing Internet / Intranet Security Issues and Solutions : The Need for Computer Security, Specific Intruder Approaches, Security Strategies, Security Tools, Encryption, Enterprise Networking and Access to the Internet Antivirus Programs, Security Teams	4	25

5	Case studies with DFD – UML, Activity diagram for : Product base : Online selling of any product (mobile , laptop ... etc) Service base : Online ticket booking (bookmy show, ola, uber booking..etc) Payment Process : Pedagogy of Payment (Credit , debit , EMI , COD ..etc) Service with data analytics : comparison base e-commerce (trivago, policybazar.com, etc...)	4	10
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Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1 : Understanding of eCommerce Concepts
- CLO.2 : Gain knowledge of eCommerce technologies and infrastructure.
- CLO.3 : Analyze business models and financial aspects of eCommerce.
- CLO.4 : Develop an understanding of digital marketing strategies for eCommerce.
- CLO.5 : Investigate data analytics and business intelligence in eCommerce
- CLO.6 : Understand the role of security and privacy in eCommerce

List of Text Book:

1. Kenneth C. Laudon, Carol Guericio Traver, E-Commerce : Business, Technology, Society (2017),13th Edition, Pearson ISBN 978-93-530-6315-3
2. Daniel Minoli, Emma Minoli, Web commerce Technology Handbook, 25th reprint, McGrawHill,

List of Reference Book:

1. S. J. , P.T. Joseph, E-Commerce: an Indian perspective, 5th Edition , PHI
2. David Whitely, E-Commerce Strategy, Technologies and Application, Tata McGraw Hill
3. Dave Chaffey, E-Business and E-Commerce Management, Strategy, Implementation and Practice, Pearson
4. Bhasker, Electronic Commerce: Framework, Technologies and Applications, 4th Edition, McGrawHill India
5. Ravi Kalakota, Andrew B. Whinston Electronic Commerce A Managers' Guide, Pearson
6. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E-Commerce:
7. Fundamentals and Applications, Wiley

E-Resource / Web Links:

- Introduction to eCommerce development and implementation (<https://magento.com> or www.woocommmerce.com, docs.woocommmerce.com).

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	M	M	M	L	L		M	M	M		M		H	M	M
CLO2	H		M	H		M	M	M	H	L	M	L	H	H	M
CLO3	M	L	H	H	H	H					M	M	H	H	M
CLO4	M	M	H		M		M	H		M	M	M	M	H	M
CLO5	M	M			M	L	M	H	H	M		H	M	H	M
CLO6	H		M	M		L	M			H			L		M

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Web .NET with ADO
Course Code:	16-CAE314-3C
Pre-requisite Course:	Introduction to Web Development and Database Fundamentals

Course Objective (CO):

This course is intended to make the students:

- Understand ASP.NET life cycle, work with web forms, configure with Global.asax /web.config, and manage IIS requests and virtual directories.
- Understand AJAX technology, use AJAX controls (Script Manager, Update Panel), and apply AJAX Control Toolkit extenders. Explore ASP.Net controls for interactive interfaces and validations.
- Use data controls, apply LINQ, implement MVC, manage state, use ASP.NET objects, and handle exceptions.
- Understand component-based programming with RCW, optimize performance with caching, and implement authentication and authorization using login controls.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weight age (%)
1.	Introduction of Asp.Net: Asp.net Application Life Cycle, ASP.net Page Life Cycle, Page Processing Sequence. Working With Asp.Net: Introduction to Web-Form and its events, Coding. Model (Inline and Code-behind), Built-in Directory Structure (App_data, App_code, Bin), Application Configuration (Global.asax file, web.config), Installation of IIS, IIS request. Handling Process, IIS manager & Creating Virtual Directory.	10	20
2.	Introduction AJAX Technology: Advantages of AJAX, AJAX Extension control (Script Manager, Script Manager Proxy, Update Panel, Update Progress, Time), AJAX Control Toolkit, Downloading and Installation AJAX Control Toolkit Extenders (The controls available in AJAX Control Toolkit)	9	20
3.	Data Controls : Data List, Detail View, Form View, Grid View, List View, Repeater. Introduction to LINQ, MVC, MVC Architecture.	9	20
4.	State Management: Client-Side: Cookies, query strings, hidden fields. Server-Side: Session, application variables. State Management Issues. ASP.NET Inbuilt Objects: Request, Response, Session, Application objects. Debugging and Error Handling: Common Errors. Exception Handling: Managing errors using try-catch blocks.	10	20
5.	Component-Based Programming: Introduction to reusable components and using Runtime Callable Wrappers (RCW) in ASP.NET. Caching Techniques: Output Caching, Fragment Caching, Data Caching. Security Implementation: Authentication, Authorization .Using built-in Login Controls for user authentication.	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO 1: Understand ASP.NET lifecycle, page processing, and configure with Global.asax and web.config.
- CLO 2: Develop web apps using web forms, coding models, and manage IIS configurations.
- CLO 3: Learn AJAX and use AJAX controls to enhance functionality.
- CLO 4: Use data controls and LINQ for data manipulation in ASP.NET apps.
- CLO 5: Implement state management and handle errors with ASP.NET objects.
- CLO 6: Optimize performance with caching and implement security using login controls.

List of Text Book:

1. ASP.NET 4.6 and Visual Studio 2015" by Mark J. Price
2. Pro ASP.NET 4 in C# and VB" by Andrew Troelsen.
3. ASP.NET AJAX in Action" by Steve Sanderson

List of Reference Book:

1. C# in Depth" by Jon Skeet
2. ASP.NET AJAX: A Beginner's Guide" by Rakesh Rajan
3. The Definitive Guide to ASP.NET" by Microsoft

E-Resource /Web Links:

- <https://www.w3schools.com/asp/>
- <http://www.tutorialspoint.com/listtutorials/asp-dot-net/1>
- http://www.pragimtech.com/dot_net_tutorials_for_beginners.aspx

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change / formulate it as per his/her methodology and requirement.

Practical List:

1. Write a Steps for configure IIS with Asp.Net
2. Write a program using the concept of cascading style sheet in ASP.net
3. Write a program to demonstrate use of Global.asax.
4. Write a program to demonstrate Login Page using Database.
5. Write a program to upload a file to a server.
6. Write a program which uses the AJAX Script Manager and Update Panel Control.
7. Write a program which uses the AJAX Update Progress Control.
8. Write a program which uses the AJAX Timer Control.
9. Write steps to add AJAX control Toolkit in to the Toolbox.
10. Write a program for Insert, Update, Delete and Search using Grid View Control.
11. Write a program for Insert, Update, Delete and Search using Detail View Control.
12. Write a program for Insert, Update, Delete and Search using Form View Control.
13. Write a program for State Management Control.
14. Write a program for pass one web form value to another web form using Query String.
15. Write a program for pass one web form value to another web form using session variable.
16. Write a program to demonstrate Cookies.
17. Write a program for exception handling.
18. Write a program to design ASP.net Login Page for website with session and cookies.
19. Write a program for online entrance examination registration form.
20. Write a program to create a MSSQL table and execute queries to Read, Add, Remove and Modify a record from that Table.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L	H		H	H	M		M	L			L	M		
CLO2			M	H		L	M		H						M
CLO3		M	L	H	H	M		L	L						M
CLO4	L	L		M	M		L	M						M	
CLO5		L	M		H		M	L				M		H	
CLO6	L	H	M	H		M	H	H	H			H	H	H	M

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Mobile Forensics
Course Code:	16-CAE315-3C
Pre-requisite Course:	Students get essential knowledge and skills for understanding digital forensics and working with technology.

Course Objective (CO):

This course is intended to make the students:

1. Understand Mobile Device Architecture and OS: Gain knowledge of mobile device components, operating systems, and file systems.
2. Learn Forensic Techniques and Tools: Acquire skills in data extraction, analysis, and recovery from mobile devices.
3. Identify and Handle Evidence: Understand legal and ethical considerations in handling mobile forensic evidence.
4. Conduct Forensic Investigations: Develop the ability to conduct complete forensic investigations on mobile devices.
5. Understand Emerging Trends: Explore modern challenges and advancements in mobile forensics.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No.	Topics	Total Hours	Weightage (%)
1.	Introduction to Mobile Forensics: Definition and Importance of Mobile Forensics, Mobile Forensics vs. Computer Forensics, Challenges in Mobile Forensics, Overview of Mobile Device Types and OS Mobile Device Architecture: Mobile Hardware Components, File Systems and Storage Formats (eMMC, NAND, etc.), Operating Systems – Android, iOS, Data Structures and Encryption Techniques	9	20
2.	Data Acquisition Techniques: Types of Acquisition (Logical, Physical, File System, Cloud), Live vs. Dead Acquisition, Bypassing Locks and Passwords, Imaging and Cloning Techniques Mobile Forensic Tools : Introduction to Tools: Cellebrite UFED, Magnet AXIOM, Oxygen Forensics, Open-Source Tools (Autopsy, MOBILedit), Tool Validation and Certification, Practical Hands-on Lab – Using Tools for Data Extraction	9	20
3.	Mobile Forensic Tools : Introduction to Tools: Cellebrite UFED, Magnet AXIOM, Oxygen Forensics, Open-Source Tools (Autopsy, MOBIL edit), Tool Validation and Certification • Practical Hands-on Lab – Using Tools for Data Extraction	9	20
4.	Mobile Artifacts and Analysis: Analyzing Call Logs, SMS/MMS, Contacts, Recovering Deleted Data, GPS and Location Data Forensics, Social Media and App Data Analysis, Browser and Download History Legal and Ethical Considerations: Chain of Custody, Admissibility of Evidence, Privacy and Ethical Issues, International and Local Standards (ISO 27037, NIST Guidelines)	9	20
5.	Reporting and Documentation: Forensic Report Writing, Presenting Evidence in Court, Expert Witness Testimony	9	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1-Understand Mobile Ecosystem – Explain mobile device architectures, operating systems (iOS, Android), and file systems.
- CLO.2-Apply Forensic Techniques – Perform mobile data extraction and analysis using industry-standard tools.
- CLO.3-Ensure Data Integrity – Demonstrate techniques for preserving data without altering the original evidence.
- CLO.4-Conduct Investigations – Analyze mobile device artifacts (call logs, messages, GPS, app data) to reconstruct events.
- CLO.5-Adhere to Legal Standards – Apply chain of custody principles and understand the legal and ethical considerations in mobile forensics.
- CLO.6-Report and Present – Create forensic reports that meet legal standards and effectively communicate findings.

List Text Book:

1. Practical Mobile Forensics by Satish Bommisetty, Rohit Tamma
2. Mobile Forensic Investigations: A Guide to Evidence Collection, Analysis, and Presentation by Lee Reiber

List of Reference Book:

1. Mobile Forensics: A Practical Guide" by Sivaraman, R. and Sankaran, M.
2. "Android Forensics: Investigation, Analysis, and Mobile Security for Google Android" by Andrew Hoog

E-Resource/Web Links:

- <https://csrc.nist.gov/>
- <https://www.forensicfocus.com/>
- <https://www.forensicpathways.com/lander>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Introduction to Open-Source Tools
 - Installation and setup of Autopsy and FTK Imager for mobile forensic investigations.
2. Logical Acquisition Simulation
 - Extract call logs, SMS, and contacts from a simulated Android device using Andriller.
3. File System Analysis
 - Analyze file system structures using Autopsy to identify hidden or deleted files.
4. SIM Card Data Extraction
 - Use open-source tools to simulate the extraction and analysis of SIM card data.
5. Cloud Forensics Simulation
 - Extract and analyze cloud backup data using a test Google Drive or Dropbox account.
6. App Data Analysis
 - Simulate extracting and analyzing data from apps such as WhatsApp or Telegram using an open-source tool.
7. Malware Detection Simulation
 - Use Andriller to identify malware activity on a simulated Android device.
8. Deleted Data Recovery
 - Recover deleted files and messages from a mobile device image using FTK Imager.
9. Basic Encryption Bypass Simulation
 - Simulate bypassing a simple password lock using MOBILedit.
10. Report Writing
 - Generate and present a forensic report based on the analysis performed during practicals.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	H	M	L							L			H	M	M
CLO2	H	H	M	H	H								H		H
CLO3	H			H	H	H							H	M	
CLO4	M	H	M	H	H					H			H	M	
CLO5				M	M	H				H			M		
CLO6								M	H		H	H			

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Windows Server Administrator - II
Course Code:	16-CAE316-3C
Pre-requisite Course:	Basic knowledge of Windows Server

Course Objective (CO):

This course is intended to make the students:

- Provide a strong formal foundation knowledge in Windows server installation and administration and inculcate skills in participants to administer the Windows server
- Understand Architecture of Windows Server 2012.
- Learn the installation of Server, Creating & implementing plans.
- Understand and learn the Implementation of User active directory and domain controller.
- Gain the knowledge of Implementation and configuration of file services & group policies.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	4	4	25	25	25	25	100

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	Preparing for Windows Server 2012 - Planning for Windows Server 2012, Assessing the readiness of your environment Deploying servers - Installation options, Preparing the build lab, Building images, Deploying images	6	20
2.	Server remote management - Server Manager, Server management tasks, Installing roles and features, Windows PowerShell automation Deploying domain controllers - Preparing for deploying domain controllers, Deploying domain controllers using Server Manager, Deploying domain controllers using Windows PowerShell Active Directory administration - Administering Active Directory objects using ADAC, Enabling advanced features using ADAC, Administering Active Directory using Windows PowerShell	6	20
3.	Network administration - Ensuring DHCP availability, Implementing DNSSEC, Managing networking using Windows PowerShell, Configuring IPv6/IPv4 interoperability Hyper-V virtualization - Deploying and configuring Hyper-V hosts, Deploying and configuring virtual machines, Managing virtual machines	6	20
4.	File services and storage - Deploying Storage Spaces, Provisioning and managing shared storage, Configuring iSCSI storage Print and document services - Deploying and managing print servers, Managing print servers using Windows PowerShell	6	20
5.	Implementing Group Policy - Planning, configuring, and managing Group Policy, Managing Group Policy using Windows PowerShell, Implementing Group Policy preferences Configuring Windows Firewall and IPsec - Configuring Windows Firewall with Advanced Security, Configuring IPsec	6	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able:

- CLO.1: Explain and demonstrate Architecture of Windows server 2012.
- CLO.2: Install and configure Windows Server, and Create & implement the plans successfully.
- CLO.3: Implement and manage User Active Directory and domain controller.
- CLO.4: Implement and configure the file services & group policies, Firewalls and IPsec in windows server.

List of Text Book:

1. John Wiley & Sons Inc
2. Packt Publishing Limited

List of Reference Book:

1. Mitch Tulloch, Installing & Configuring Windows Server 2012 Training Guide, Microsoft Press.

E-Resource/WebLinks:

- <https://www.microsoft.com/en-in/windows-server/resources>

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Install and configure a DHCP server to provide IP addresses for a specified subnet.
2. Set up a file server with shared folders and appropriate NTFS and share permissions.
3. Create a GPO to enforce a password policy and apply it to an OU.
4. Deploy a basic DNS configuration with forward and reverse lookup zones.
5. Configure a Hyper-V host and deploy a VM with specific hardware and network settings.

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L	L	L	L	L	L	M	L	L	M	L	L			
CLO2	H	M	M	L	L	L	H		L	L	L	M			
CLO3	H	M	L	M	L	L		L	L	L	L	L			
CLO4	L	M	M	L	M	L	L	L	L	M	M	L			

H:High,M:Medium,L:Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Professional Communication
Course Code:	16-AEC118-3C
Pre-requisite Course:	Basic knowledge of communication skill

Course Objective (CO):

This course is intended to make the students:

- Understand the principles of professional communication and its types.
- Understand and apply the techniques of professional business writing.
- Enhance interpersonal communication skills in workplace interactions.
- Master public speaking skills and audience engagement.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
-	-	4	2	-	-	25	25	50

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1.	BASIC KNOWLEDGE IN PROFESSIONAL COMMUNICATION Written oral, visual, and digital communication within a workplace context. Writing: Technical writing, letter writing, job applications, CV preparation, and report writing Speaking: Phonetics, Multimedia feedback system, elevator pitch, Telephone etiquette and presentation skills. Listening: Exercises based on audio materials like radio and podcasts Reading: Speed reading, reading with the help of audio visual aids skills.	10	20
2.	Effective communication is dependent on three key elements: Clarity, Conciseness AND Consistency.	8	20
3.	The 7 C's of professional communication: Clear, Concise, Concrete, Correct, Coherent, Complete, and Courteous.	10	20
4.	Professional communication Good Effects And Bad Effects: GOODEFFECTS:-Building relationships, Improved productivity, Innovation, Collaboration. BEADEFFECTS:-Destabilizing the work environment, Negative communication, Client dissatisfaction.	10	20
5.	Difference Between :- Good communication, Poor communication AND Toxic communication.	8	20

Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO.1: Identify and explain the various types of communication in professional contexts.
- CLO.2: Write professional business emails, letters, and reports effectively.
- CLO.3: Demonstrate the use of interpersonal communication in professional settings
- CLO.4: Apply professional etiquette and cross-cultural communication strategies.

List Text Book:

1. Five Stars: The Communication Secrets to Get from Good to Great.
2. Just Listen: Discover the Secret to Getting Through to Absolutely Anyone

List of Reference Book:

1. Unleash the Power of Storytelling: Win Hearts, Change Minds, Get Results
2. We Need to Talk: How to Have Conversations That Matter

E-Resource / Web Links:

- Professional Communication: Global Good
- Business and Professional Communication
- Professional Communication
- Professional Communication: Deliver effective

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Practical List

1. Business Email Writing Experiment, Business Report Writing Experiment
2. Formal Presentation Experiment
3. Meeting Simulation and Minute-Taking Experiment
4. Resume and Cover Letter Writing Experiment
5. Role-Playing Professional Scenarios Experiment
6. Team Collaboration and Communication Experiment
7. Business Email Writing , Report Writing
8. Video Conferencing and Virtual Communication
9. Resume and Cover Letter Writing
10. Business Presentation Preparation and Delivery
11. Group Discussion and Debate
12. Role-playing Professional Scenarios

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	L	M	M	L	M	M	M	M	L	M	L	L	L	M	L
CLO2	L	M	H	M	M	M	M	M	M	L	M	L	L	H	L
CLO3	L	L	M	M	M	M	L	M	L	L	M	L	L	L	M
CLO4	M	M	L	H	H	L	M	L	M	M	M	M	M	M	L

H: High, M: Medium, L: Low

Branch Name:	Bachelor of Computer Application (BCA)
Program Code:	CS101
Course Title:	Internship / OJT (On Job Training)
Course Code:	16-CAM317-3C
Pre-requisite Course:	Zeal, Zest and Enthusiasm to acquire skills through on-the-job training

Course Objective (CO):

This course is intended to make the students:

- To bridge the gap between theoretical knowledge and practical implementation.
- To provide real-world IT industry exposure.
- To develop soft skills, project management skills, and teamwork.
- To make students job-ready and enhance rural entrepreneurship awareness.
- To get an idea about how Research & Development projects are created.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
-	-	8	4	-	-	50	50	100

Course Contents:

- The duration of internship will be four months. It will be an ongoing internship during Semester-VI.
- Each student will be assigned a faculty as a mentor from the college.
- Each student acquiring an internship (on job training) will have an Industry personnel/industry expert as a point of contact for students and faculty. Industry personnel as a co-mentor will guide students on attaining required skills through proper on the job training.
- Students under guidance of Faculty (Mentor) and industry expert/personnel (Co-mentor) will complete his/her internship and prepare reports and deliver presentations.
- Students have to submit their work, every 15/21/30 days, during the reporting dates. Student will submit a hardcopy reports.
- Submission of work will be in terms of preparing presentations.
- Final work has to be submitted by each student, by preparing final presentation and final internship report.
- Students should produce a successful internship completion certificate acquired from industry to department and Training and Placement Cell.

Course Learning Out comes(CLO):

On completion of the course, student will be able to:

- CLO.1 - to explore the industrial/organizational/corporate environment.
- CLO.2 - to gain opportunities to learn, understand and sharpen the real time technical and managerial skills required at the jobs.
- CLO.3 - to attain corporate skills in the field of computer applications.
- CLO.4 - To apply coding, testing, and debugging techniques in real environments.
- CLO.5 - to understand the social, economic and administrative considerations that influence the working environment of industrial organizations.
- CLO.6 -Expose students to the role, responsibilities and ethics in field of computer applications

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CLO1	M	M	L	M									M	M	
CLO2	L	H	L	M	M								L	H	
CLO3	H	H	M	L	L								L	H	
CLO4	L	M	M	H	M								M	H	
CLO5	L	L	L	L									L	M	
CLO6	M	M	M	M									L	M	

H:High, M:Medium, L:Low