Sarvjanik University

Sarvajanik College of Commerce and Computer Application

Teaching Scheme for B.C.A.

Program Structure		Semester - V						
Sr No.	Course Code	Subjects	Teaching Hrs. per week		University Examination		Internal Marks	Total Marks
			Theory	Practical	Dura	Marks		
1	BSCA11501	Information Security	4			30	70	100
2	BSCA11502	Advance Java	4			30	70	100
3	BSCA11503	Mobile Application Development with Flutter	4			30	70	100
4	BSCA12504	Practical - 5		4		50	50	100
5	BSCA12505	Minor Project		4		50	50	100
		Total	**20**			**190**	**310**	**500**

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Teaching Scheme for B.C.A.

Program Structure		Semester - VI						
Sr No.	Course Code	Subjects	Teaching Hrs. per week		University Examination		Internal Marks	Total Marks
			Theory	Practical	Dura	Marks		
1	BSCA11601	Cyber Security	4			30	70	100
2	BSCA11602	Cloud Computing	4			30	70	100
3	BSCA11603	E-commerce	4			30	70	100
4	BSCA18604	Project		8		100	100	200
		TOTAL	**20**			**190**	**310**	**500**

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Sarvajanik College of Commerce & Computer Applications

Faculty	Computer Application	Programme	BCA
Year	3	Version	1.0
Semester	5	Effective From	June 2024
Course Code	**BSCA11502** Course Name	**Advance Java**	

Teaching Scheme				**Examination Scheme**		
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**	**Total**
4	4	-	4	70	30	100

Course Objective

This subject aims to impart advanced knowledge and skills in Java programming, encompassing concepts such as multithreading, Servlets, JSP, and Applets

Course Learning Outcomes

Upon completing the Advanced Java course, students will master advanced programming concepts and technologies such as multithreading, Java EE, JSP, Servlets, and Applets, enabling them to develop robust, scalable Java applications.

Units	**Content**	**Weight/ Teaching Hours**
1	**AWT, Events, File Handling** - AWT Components (Containers, Buttons, Label, TextField, TextArea, Panel, Scrollbar, Checkbox) - Event Handling in Java - Event Listners - File Handling in java - file handling with CRUD	**6**
2	**Java Applet** - local and remote applets, - difference between applet and application - applet life cycle - developing executable applet code - adding applet to HTML file - running the applet, passing parameter to applet - various methods and component classes to develop basic applet	**8**
3	**Threads** - Threads: What are threads? - Threads vs. Process - Ways of creating a thread - Thread class - Life cycle of Thread - Multithreading and Synchronization: How to create multiple threads - Synchronization between threads using synchronized methods & blocks - Deadlock	**8**
4	**JDBC** - JDBC Architecture - Types of JDBC Drivers - Introduction to major JDBC Classes and Interface - Statement Interface, PreparedStatement, CallableStatement - Exploring ResultSet Operation	**6**

	- Creating simple JDBC Application,	
5	**JSP** - Introduction to JSP - JSP vs Servlet - JSP Life Cycle - JSP Architecture - JSP scripting tags - JSP Directive Elements - JSP action Tags	**6**
6	**Servlet** - Introduction to Servlets - Servlet Architecture - Life Cycle of Servlet - ServletConfig and ServletContext - RequestDispatcher and sendRedirect - Sessions and session tracking techniques - CRUD in Servlet	**10**

Suggested Reference Books:

1 Flutter Complete Reference 2.0 Alberto Miola 2023 1st Edition
2 Flutter in Action Eric Windmill 2019 1st Edition
3 Beginning App Development with Flutter Rap Payne 2019 1st Edition

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Sarvajanik College of Commerce & Computer Applications							
Faculty	Computer Application			Programme	BCA		
Year	3			Version	1.0		
Semester	5			Effective From	June 2024		
Course Code	**BSCA11503**	Course Name		**Mobile App Development with Flutter**			
Teaching Scheme				**Examination Scheme**			
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**		**Total**
4	4	-	4	70	30		100

Course Objective

This Course will enable students to create mobile applications across the mobile operating systems - Android and iOS. Students understand how to implement OOPS concept to create efficient and Implementable applications.

Course Learning Outcomes

At the end of this course, students will be able to:

- describe Flutter architecture, widgets and their life cycle.
- practice the designing a well interface using Widgets and Components.
- perform CRUD Operations Using Local Database and Rest API's.
- use navigation between different pages and refresh screens with data.

Units	Content	Weight/ Teaching Hours
1	**Introduction To OOPS Concept Using Dart** - Variables and Data types, - Decision Making and Loops, - Functions(Named parameters, Optional positional parameters, Optional parameter with default values, Anonymous functions), - Class, Constructor, Object, - Abstraction, Encapsulation, Inheritance, - Polymorphism (Compile-time polymorphism, Runtime polymorphism).	**10**
2	**Flutter Architecture & Inbuilt Widgets** - Flutter Architecture, - Project Structure (Pubspec File, Assets, Lib, Android, iOS), - Run Window, Inbuilt Widgets, - Stateless Widget, Statefull Widget, - Single Child Widget (Scaffold, Safearea, Text, TextField, TextFormField, Button, Container, Card, Padding), - Multi Child Widget (Row, Column, Stack), - SnackBar, App Bar, etc.	**10**
3	**Scrollable Widgets, Dialogs & State Management** - List View, Grid View, - Difference between Listview & Listview.builder, - Difference between Gridview & Gridview.builder, - PageView, Single Child Scroll View, Nested Scroll View, - Bottom Sheet, Drawer, BottomNavigatorBar, Date Picker Dialog, - Alert Dialog, Mixin, - What is state management,	**10**

	- Categories of State Management (Ephemeral State, App State), - State management approaches, Provider, setState, - CheckboxGroup and RadioButtonGroup	
4	**Database Connectivity & Navigation** - MaterialPageRoute, - Navigator.push(), Navigator.pop(), - Return Data to Previous Page using pop() & push().then(), - Routing, Future, FutureBuilder, - Async Await, Shared Preferences, - Database in Flutter, Sqlite Database, - CRUD Operations.	**10**

Suggested Reference Books:

1. Beginning App Development with Flutter (TextBook) By Rap Payne | Apress | 1st
2. Beginning Flutter: A Hands On Guide to App Development By Marco L. Napoli | Wrox | 1st
3. Pragmatic Flutter (TextBook) By Priyanka Tyagi | CRC Press | 1st
4. Flutter Apprentice By Moore K.
5. Flutter Complete Reference By Alberto Miola

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Sarvajanik College of Commerce & Computer Applications						
Faculty	Computer Application			Programme	BCA	
Year	3			Version	1.0	
Semester	5			Effective From	June 2024	
Course Code	**BSCA11501**	Course Name		**Information Security**		
Teaching Scheme				**Examination Scheme**		
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**	**Total**
4	4	-	4	70	30	100

Course Objective

The objective of Information Security is to upgrade fundamentals of security over network. This course covers basic cryptography concepts, techniques and encryption algorithms. After going through this course student will be able to configure security policy in OS

Course Learning Outcomes

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Describe importance of Security in Communication.
ii. Explain basic concept of Encryption Algorithm.
iii. Elaborate Firewall Techniques.
iv. Explain latest trends in OS Security Assessment Tools.
v. Install various firewalls for information security.
vi. Apply/Use anti malware and Cleanup Tools for betterment of information security.
vii. Apply/Use antivirus effectively for the security of OS.

Units	Content	Weight/ Teaching Hours
1	**Introduction of Information Security** - Need of Information Security - Security Trends - What is Information Security - Overview of Information Security - Security Services - Security Mechanism - Security Attacks - The OSI Security Architecture - A Model for Network Security	**05**
2	**Security Techniques** - Symmetric Cipher Model - Cryptography ,Cryptanalysis - **Substitution Techniques** i. Caesar Cipher ii. Monoalphabetic Cipher iii. Polyalphabetic Cipher iv. Playfair Cipher v. Hill Cipher - Problems with Symmetric Cipher Algorithms	**12**

	- Diffie-Hellman Key exchange algorithm - Transposition Techniques - Steganography	
3	**Symmetric Encryption Algorithm** - Block Cipher Principal - The Data Encryption Standard - Feistel Structure - First Round of DES - **Strength of DES** i. Double DES ii. Man in the Middle Attack - **Block Cipher Modes of Operation** i. Electronic Code Book ii. Cipher Block Chaining Mode iii. Cipher Feedback Mode iv. Output Feedback Mode v. Counter Mode	**10**
4	**Asymmetric Key Encryption** - Limitations of Symmetric Key Encryption - Asymmetric Key Encryption i. Maintaining Confidentiality ii. Maintaining Authentication iii. Managing confidentiality and authentication together	**05**
5	**System Security** - Intrusion - Classification of Intruders - **Intrusion Detection techniques.** i. Statistical anomaly detection ii. Rule based detection. - Password Management - Password selection strategies. - Malicious software : Virus and Related Threats, Virus Countermeasures - Need of firewall. - Firewall characteristics. - **Types of Firewall** i. Packet filtering firewall. ii. Application proxy firewall. **iii.** Circuit level proxy firewall.	**10**

Suggested Reference Books:

1. Cryptography and Network Security, William Stallings, Pearson
2. Cryptography and Network Security Forouzon Mc Graw Hill
3. Network Security Essentials. William Stallings Pearson
4. Network Security: Private Communication in a Public World Charlie Kaufman Prentice Hall
5. Cryptography Theory and Practice Douglas R. Stinson

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Faculty	Computer Application			Programme	BCA	
Year	3			Version	1.0	
Semester	6			Effective From	June 2024	
Course Code	**BSCA11602**	Course Name		**Cloud Computing**		
Teaching Scheme				**Examination Scheme**		
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**	**Total**
4	4	-	4	70	30	100

Course Objective

This subject aims to provide a comprehensive understanding of basic concepts of cloud computing, cloud computing models and platforms, Virtualization Techniques, Risk involved in cloud computing, privacy issues.

Course Learning Outcomes

Upon completing the Cloud Computing course, students will be able to Understand concepts of Cloud Computing, cloud architecture and deployment models, cloud service providers, virtualization techniques and Service & privacy issues in cloud computing.

Units	Content	Weight/ Teaching Hours
1	**Introduction to Cloud Computing** - Cloud Computing - Definition of cloud computing - Central Ideas Behind Cloud Computing - Characteristics of Cloud Computing - Challenges of Cloud Computing - Novel Applications of cloud computing - Security risk of cloud computing - Advantages and Disadvantages of Cloud Computing	**8**
2	**Virtualization Techniques** - Introduction of Virtualization - Working of Virtualization - Types of Virtualization(Desktop virtualization, Network Virtualization, Storage Virtualization, Data virtualization, Hardware Virtualization, Software Virtualization) - Advantages and Disadvantage of Virtualization - Characteristic and Applications of Virtualization - Hypervisors (Type 1 Hypervisor, Type 2 Hypervisor)	**10**
3	**Cloud Computing Architecture & Deployment Model** - Introduction to cloud computing architecture & deployment model - Components of cloud computing architecture (Client Infrastructure, Cloud access device, Application, Services, Runtime cloud, storage, Infrastructure Security)	**10**

	- Types of cloud deployment models (public cloud, private cloud, hybrid cloud, community cloud, multi cloud) - Key drivers to adopting the cloud - The impact of cloud computing on users - A comparative analysis of cloud deployment models	
4	**Cloud Service Model & service providers** - Introduction to cloud service model (SaaS, PaaS, IaaS) - Advantages and Disadvantages of SaaS, PaaS, IaaS - Difference between SaaS, PaaS, IaaS - Service providers (Amazon web service, Microsoft Azure, Google cloud platform, IBM cloud service, VMware cloud, Oracle cloud, Red hat)	**4**
5	**Cloud Security and Privacy issues** - Infrastructure security - Network-level security - Application-level security - Host level security - Data Security and Storage - Privacy issues - Data Life cycle -	**8**

Suggested Reference Books:

1. Cloud Computing Fundamentals, Industry Approach and Trends: Rishabh Sharma 2015 2nd Edition
2. Cloud Computing For Dummies, Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, 2010, 1st Edition
3. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej Goscinski 2013, 1st Edition

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Faculty	Computer Application			Programme	BCA	
Year	3			Version	1.0	
Semester	6			Effective From	June 2024	
Course Code	**BSCA11601**	Course Name		**Cyber Security**		
Teaching Scheme				**Examination Scheme**		
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**	**Total**
4	4	-	3	70	30	100

Course Outcome:

The course aims to equip students with expertise in vulnerability scanning, network defense tools, web application security, cybercrime investigation, ethical hacking, penetration testing, and firewall concepts to effectively mitigate cyber threats and secure networks.

Course Learning Outcomes:

Upon completing the Cloud Computing course, students will be able to understand concepts of network security, vulnerability scanning, web application security, cybercrime investigation, ethical hacking, penetration testing, and firewall management to effectively secure cloud-based infrastructures.

Units	Content	Weight/ Teaching Hours
1	**Systems Vulnerability Scanning:** - Overview of vulnerability scanning, - Open Port / Service Identification, - Banner / Version Check, Traffic Probe, - Vulnerability Probe, Vulnerability Examples, - OpenVAS, Metasploit. - Networks Vulnerability Scanning - Netcat, Socat, - understanding Port and Services tools - Datapipe, Fpipe, WinRelay	**8**
2	**Network Defense tools Firewalls and Packet Filters:** - Firewall Basics, Packet Filter Vs Firewall, - How a Firewall Protects a Network, - Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, - Network Address Translation (NAT) and Port Forwarding, - the basic of Virtual Private Networks, Linux Firewall	**6**
3	**Web Application Tools Scanning for web vulnerabilities tools:** - Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, - Application Inspection tools – Zed Attack Proxy, Sqlmap. - DVWA, Webgoat, - Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, - HTC-Hydra	**4**
4	**Introduction to Cyber Crime and law**: - Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, - Clarification of Terms, - Traditional Problems Associated with Computer Crime,	**6**

	- Introduction to Incident Response, Digital Forensics, Computer Language,	
5	**Introduction to Cyber Crime Investigation** - Firewalls and Packet Filters, password Cracking, - Keyloggers and Spyware, Virus and Warms, - Trojan and backdoors, Steganography, - DOS and DDOS attack, Buffer Overflow, - Attack on wireless Networks	**4**
6	**Ethical Hacking, penetration Testing, Firewall** - Ethical Hacker, Roles and Responsibilities, - Benefit of Ethical Hacking, Skills require to become Ethical hacker, - Penetration testing concepts, Phases of Ethical hacking, - Areas of penetration testing, SQL Injection, - Concepts of SQL Injection, - Types of SQL Injection, - Case study of SQL Injection.	**8**
7	**Firewall** - Concepts of Firewall, - Types of Firewall, Working of firewall, - Advantages and Importance of Firewall	**4**

Suggested Reference Books:

1. Frontiers of Electronic Commerce, Ravi Kalakota and Andrew Whinston, Addition Wesley
2. Electronic Commerce: A Managerial Perspective, Efraim turban, Jae Lee, David King, H. Michel Chung, Addition Wesley

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Faculty	Computer Application			Programme	BCA	
Year	3			Version	1.0	
Semester	6			Effective From	June 2024	
Course Code	**BSCA11603**	Course Name		**E-commerce**		
Teaching Scheme				**Examination Scheme**		
Credits	**Lecture**	**Practical**	**Total**	**CA**	**TEE**	**Total**
4	4	-	4	70	30	100

Course Objective:

This course aims to provide a comprehensive understanding of the technological aspects, frameworks, and security considerations of e-commerce, while also addressing consumer-oriented strategies, business-to-business transactions, and ethical implications,

Course Learning Outcomes:

Upon completion of this course, students will gain expertise in e-commerce technologies, consumer-oriented strategies, business-to-business transactions, security protocols, and ethical considerations, enabling them to excel in the dynamic landscape of electronic commerce.

Units	Content	Weight/ Teaching Hours
1	**E-commerce and its Technological Aspects** - Overview of developments in Information Technology and Defining E-Commerce: The scope of E commerce, Electronic Market, Electronic Data Interchange, - Internet Commerce, Benefits and limitations of E-Commerce, - Produce a generic framework for E-Commerce, - Architectural framework of Electronic Commerce, - Web based E Commerce Architecture.	**8**
2	**Consumer Oriented E Commerce E-Retailing:** - Traditional retailing and e retailing, Benefits of e retailing, Key success factors, Models of e retailing, Features of e retailing. - E services: Categories of e-services, Web-enabled services, matchmaking services, - Information-selling on the web, e entertainment, - Auctions and other specialized services. - Business to Business Electronic Commerce	**8**
3	**Electronic Data Interchange:** - Benefits of EDI, EDI technology, - EDI standards, EDI communications, - EDI Implementation, EDI Agreements, - EDI Security. Electronic Payment Systems, - Need of Electronic Payment System: - Study and examine the use of Electronic Payment system and the protocols used	**10**

4	**Security in E Commerce:** - Threats in Computer Systems: Virus, - Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, - Network Firewalls and Application Firewalls, Proxy Server.	**6**
5	**Issues in E Commerce** - Understanding Ethical, Social and Political issues in E-Commerce: A model for Organizing the issues, Basic Ethical Concepts, - Analyzing Ethical Dilemmas, - Candidate Ethical principles Privacy and Information Rights: - Information collected at E-Commerce Websites, - The Concept of Privacy.	**8**

Suggested Reference Books:

- E-commerce 2018: Business, Technology, Society" by Kenneth C. Laudon and Carol Guercio
- E-commerce Essentials" by Kenneth C. Laudon, Carol Guercio Traver, and Bryan O'Keeffe