Semester - IV

4BCA1 - Programming with Java

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand the usage of Java SDK environment and apply to create, debug and run simple java programs.
- Understand and apply the basic concept of java programming such as character set, variables, data types, conditional and iterative execution, methods, etc.
- Understand and implement the Object-Oriented Programming (OOPs) concepts in java, through defining classes, invoking methods, using class libraries, etc.
- Learn the creation and the usage of arrays and threads in java.
- Learn and demonstrate java applets.

Course Outcomes

1. Explain the object oriented concepts and apply them for solving real problems.
2. Demonstrate and apply the various features Java SDK to develop, run and debug java programs.
3. Apply java technology to develop the small applications, utilities, and web applications.
4. Apply events management and layout managers using awt, swing, jdbc and servlet for developing the software for various problems.

Unit-wise Syllabus

UNIT-I

C++ vs java, java and internet and WWW, java support systems, java environment, java program structure, tokens, statements, java virtual machine, constants & variables, data types, type casting, operators, expressions & its evaluation, decision making and branching, loops, jumps in loops, labeled loops.

UNIT-II

Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods, inheritance: extending a class, overriding methods, final variables and method~, final classes, finalizes methods, abstract methods and classes, visibility control.

UNIT-III

Arrays, one dimensional & two dimensional, strings, vectors, wrapper classes, defining interfaces, extending interfaces, implementing interfaces, accessing interface variables, system packages, using system packages, naming conventions, creating packages, accessing a package, using package, adding a class to a package, hiding classes.

UNIT-IV

Threads, creating threads, extending the threads class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the unable interface.

UNIT-V

Applets, local and remote applets, applets VS applications, writing applets, applets life cycle, creating an executable applet, designing a web page, applet tag, adding applet to HTML file, running the applet, passing parameters to applets, aligning the display, HTML tags & applets, getting input from the user interface.

References:

- E. Balagurusamy, "Programming with Java, a Primer",TMH, ISBN-13: 978-0-07-061713-1, ISBN-10: 0-07-061713-9.
- Patrick Naughton and Herbert Schildt, "Java: the Complete Reference", TMH Publication, ISBN 0-07-463769-X.
- Yashavantkanetkar, "Let us Java", BPB Publications.
- Cay Horstmann, "Big Java", Wiley Publication
- Peter Norton, "Java Programming", Techmedia Publications.
- Joseph Weber, "Using Java 1.2", PHI, ISBN -81-203-1558-8.

	Program Outcomes (POs)											
COs	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	1		1	2	1	2	1
2	3	2	3	2	3	1			1	1	2	1
3	3	1	3	2	3	2		2	2	1	2	1
4	3	2	2	2	1		1	2	2	2	1	2

4BCA2- Software Engineering

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
5/1	1/1	0	6/6	80	20	0	100

Course Objectives:

- Understand, learn and apply the theoretical and practical knowledge of software development such as software development paradigms, process, models, tools and techniques.
- Understand and learn the process of software requirements identification, analysis, review, and learn recording requirements in the standard format of the SRS document.
- Understand the various types and levels of software testing and basic approaches of test case designing.
- Gain the knowledge of the various models of software quality, estimation, quality assurance and control.

Course Outcomes:

1. Identify, analyze, review and validate the requirement of software components and system, and also prepare software requirement specification (SRS) document using relevant standards, tools and methodologies.
2. Manage a software project by applying project management concepts such as planning, scheduling and risk management for developing qualitative and economic software.
3. Develop and maintain the software system to solve real life problems in team with sustainability.
4. Work effectively in various profiles of software developing team such as software analyst, architecture, programmer, tester, quality assurance and project manager.

Unit-wise Syllabus

UNIT - I

Software : software characteristics and appli1cations, software engineering - a layered technology, software process models - linear sequential model, prototype & RAD model, incremental model and spiral model. Project metrics: software measurement–size oriented, function oriented metrics, extended function point metrics.

UNIT - II

Software project planning: objectives, decomposition techniques, and empirical estimation models. Analysis concept and principles: requirement analysis, analysis principles.

UNIT – III

Design concepts and principles: design process, design concepts, design principles, effective modular design, human computer interface design, interface design guidelines.

UNIT – IV

S/w quality assurance: quality concepts, reliability s/w testing models: s/w testing fundamentals, white and black box testing, basic path testing, testing strategies: strategic approach to s/w testing, unit testing, integration testing, validation testing, system testing.

UNIT - V

S/w reuse: reuse process, classification and retrieving components, economics of s/w reuse

Software maintenance- need for software maintenance, maintenance models.

Software configuration management (SCM) – version control – SCM process – software configuration items

Computer aided software engineering (CASE): introduction to case, taxonomy of case tools

References:

- R S Pressman, Software Engineering
- Pankaj Jalote An Integrated Approach To Software Engineering
- K. K. Aggarwal, Yogesh Singh, Software Engineering,
- Ian Sommerville, Software Engineering, Addison-Wesley Publishing Company,
- James F. Peter, Software Engineering - an Engineering Approach, John Wiley,
- Fairley Richard Software Engineering Concepts, Tata McGraw Hill

	Program Outcomes (POs)											
COs	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	2	2	2	1		1	2	1	2	1
2	3	2	3	2	3	1			1	1	2	1
3	3	1	3	2	3	2		2	2	1	2	1
4	3	2	2	2	1		1	2	2	2	1	2

4BCA3(A) - Windows Server Administration

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- 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.

Course Outcomes:

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

Unit-wise Syllabus

UNIT-I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

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

UNIT - V

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

References:

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

	Program Outcomes (POs)											
Cos	1	2	3	4	5	6	7	8	9	10	11	12
1	3	3	3	1	2	1	2	1	1	2	1	1
2	3	2	2	2	1	1	2		2	1	1	2
3	3	2	1	2	1	1		1	1	1	1	1
4	3	3	2	1	2	1	1	1	1	2	2	1

4BCA3 (B) - Cyber Security

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
4/4	0	2/4	6/8	80	20	0	100

Course Objectives:

- Understand the fundament concepts of Cyber and Information Security
- Gain the knowledge of different types and working of malware and security hazards incident of real-world.
- Understand cryptography techniques and apply them for secure data communication and authentications
- Understand the working and implementation of Firewall.
- Understand the concept of cyberspace and cyber crime and digital signature

Course Outcomes:

1. Explain various security concepts and apply them in daily cyber use.
2. Configure firewall and other security setting in computer
3. Perform the malware and spam email identification, analysis, virus scanning and cleaning and other services using security tools
4. Explain and practice the Cyber Law, Ethics, and Intellectual Property Rights, Patent and Trademark and Design Law

Unit-wise Syllabus

UNIT-I

Information security: overview, information security importance, information security components. Threats to information system- external and internal thread, security threat and vulnerability- overview, malware, type of malware: virus, worms, trojans, rootkits, robots, adware's, spywares, ransom wares, zombies etc., desktop security-

UNIT-II

Application security- database security, e- mail security, internet security, principles of security- confidentiality, integrity, availability, introduction to cryptography- symmetric key cryptography, asymmetric key cryptography, message authentication, applications of cryptography. Security technology- firewall, type of firewall, firewall benefits, VPN, antivirus software

UNIT-III

Cyberspace- cloud computing &security, social network sites security, attack prevention-passwords, protection against attacks in social media, securing wireless networks, security threats.

UNIT-IV

Cybercrime-concept of cybercrime, type of cybercrime, phishing, cyber crime prevention, case study, security threats to e- commerce- electronic payment system,
Digital Signature– digital signature process.

UNIT-V

ISO- international organization for standardization, world intellectual property organization, cyber law- cyber law in India, IT act 2000, intellectual property rights- definition, intellectual property, categories of intellectual property, rights protected under intellectual property, copyright, patent and trademark, design- design law in India

References:

- Allan Friedman and P. W. Singer, Cyber Security and Cyber war: What Everyone Needs to Know by Published Oxford University
- Don Franke, Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Publisher CreateSpace Independent Publishing Platform, 2016
- Mayank Bhushan, Fundamental of Cyber Security

	Program Outcomes (POs)											
COs	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	2	2	1	3	1	2		2
2	3	2	2	3	3	1		2	1	2	1	2
3	3	3	2	3	2	2	1	2	2	2	1	2
4	3	3	1	2	1	3	2	2	3	2	1	2

4BCA4- E-Commerce and E-Governance

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	0	1/2	3/4	40	10	0	50

Course Objectives:

- Gain Knowledge to develop skills in understanding strategic issues related to e-commerce and e- governance
- Obtain the broad knowledge of state of art of e-governance and e-commerce activities and scenario in India
- Understand the electronic payment systems and security
- Gain knowledge of government initiative, policy and law and its implementation in the country in area of e-commerce and e- governance.

Course Outcome:

1. Explain and demonstrate E-Governance Initiatives at the National Level in India
2. Make Classification of E-Commerce and E- Governance
3. Think innovatively and analyze critically to startup New Successful Business Ideas.
4. Explore and exploit Government E-seva such Aadhar Card, Pass Port, Dig locker, E-payment, M-payment etc

Unit-wise Syllabus

UNIT-I

Introduction to E-commerce: Definition, History of E-commerce, E-business Models B2B, B2C, C2C, C2B, legal; Environment of E-commerce, Dimensions of E-commerce, ethical issues, electronic data interchange, value chain and supply chain, E-commerce Marketing, E-commerce Strategy, E-commerce Infrastructure, Advantages and Disadvantages of e-commerce.

UNIT - II

Electronic payment systems: payment gateways, payment cards, credit cards, debit cards, smart cards, e-credit accounts, e-money, marketing on the web, categories of e-commerce, EDI, marketing strategies, advertising on the web, customer service and support, internet banking, introduction to m-commerce, case study: e-commerce in passenger air transport, element of e-commerce, issues of e-commerce.

UNIT - III

E-government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT - IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e- governance, e-seva. Origins in India E-Governance Projects in India, Measures to be considered before going for E-Governance, Work plan and Infrastructure. Digital payment initiatives in India, Digital Payment platforms and applications. Use of Aadhar number in digital services.

UNIT - V

E-government systems security: challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers. E-security network and web site risk for e-business, information technology act 2000 and its highlights related to e-commerce, e-security, firewalls, electronic market / e- shop, introduction to security, types of securities, security tools, network security, securities in e-payments.

References:

- Gary P. Schneider, "E-Commerce", Cengage Learning India.
- C.S.R. Prabhu, "E-Governence: Concept and Case Study", PHI Learning Private Limited.
- P. Tjoseph, S.J.,"E-Commerce an Indian Perspective", Prentice-Hall of India.
- V. Rajaraamn, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
- Amir Manzoor " E-Commerce: an Introduction", Lambert.

	Program Outcomes (POs)											
COs	1	2	3	4	5	6	7	8	9	10	11	12
1	3	2	1	2	2	2	1	3	1	2		2
2	3	2	2	3	3	1		2	1	2	1	2
3	3	3	2	3	2	2	1	2	2	2	1	2
4	3	3	1	2	1	3	2	2	3	2	1	2

4BCA5 Open Elective – 4

4BCA5 (A) – Programming with Python

L	T	P	C	Theory	Internal	Practical	Total Marks
Credits/Hours							
2/2	1/1	0	3/3	40	10	0	50

Course Objectives:

- To Introduce Python Programming Language as Multipurpose Programming Language with Features and Applications.
- To Learn Installing Python and Introducing Cross Multiplatform Usage of Python.
- To Practice Basic Language Features of Python and Implement Oops Concepts Using Python.
- Learn core python structures and flow control, Create and run python functions
- Explore the python library functions for various purpose

Course Outcomes:

1. Install and use Python on Various Platform.
2. Understand and Explain various features of Python language
3. Design and Develop Python applications for data analysis using object-oriented concept
4. Build package and modules in Python with reusability and exception Aspect
5. Write and execute Simple programs for sorting and searching in Python.

Unit-wise Syllabus

UNIT - I

Planning the computer program: concept of problem solving, problem definition, program design, debugging, types of errors in programming, documentation.

Techniques of problem solving: flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. Top-down and bottom-up programming.

Overview of programming: structure of a python program, elements of python.

UNIT - II

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wise operator, increment or decrement operator)

Creating python programs: input and output statements, control statements(branching, looping, conditional statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions.

Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT - III

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables

Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.