

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

**Shri Swami Vivekanand Shikshan Sanstha's
Vivekanand College, Kolhapur
(Autonomous)**



DEPARTMENT OF B.C.A

**B.C.A Part – III
Semester-V& VI**

SYLLABUS

Under Choice Based Credit System

To be implemented from Academic Year 2023-24

CHOICE BASED CREDIT SYSTEM

B.C.A – III (Sem -V and VI)
Course Structure
to be implemented from 2023-24
BCA-III (Sem-V)

Course Code	Title of Paper	Credit	Internal	External	Total
CC- BCA 1419E	ASP.Net with C#	4	30	70	100
CC- BCA 1420E	Cloud Computing	4	30	70	100
CC- BCA 1421E	Computer Networks	4	30	70	100
CC-DSE- BCA1422E	Elective-I E1-1. Python Programming E1-2. R Programming	4	30	70	100
CC-GE BCA 1423E	Elective-II E1-1. Digital Marketing E1-2. Management Information System	4	30	70	100
CCL BCA-1424E	Lab Course-VIII Based on ASP.Net with C# and DSE	2	-	50	50
CCL BCA-1425E	Mini Project (Field work min. 2 weeks)	2		50	50
BCA-SEC-II	Soft Skill	2	50		
		26	150	450	600

BCA-III (Sem-VI)

Course Code	Title of Paper	Credit	Internal	External	Total
CC BCA- 1426F	Data Warehousing and Data Mining	4	30	70	100
CC BCA- 1427F	Java Programming	4	30	70	100
CC-DSE BCA- 1428F	Elective-I E1-1. Android Programming E1-2. Internet of Things (IOT)	4	30	70	100
CC-GE BCA- 1429F	Elective-II E2-1. M - Commerce E2-1. ERP	4	30	70	100
CCL BCA- 1430F	Lab-I Course IX Based on 1427F	2	-	50	50
CCL BCA- 1431F	Lab-II Course X Based on DSE	2	-	50	50
CCL BCA-	Major Project (Industrial visit)	4	30	70	100

1432F					
BCA-SEC- II	Personality Development	2	50		
		26	150	450	600

B.C.A Part – III
Semester – V Part- III
ASP.Net with C# (BCA 1419E)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Understand the Microsoft .NET framework and ASP.NET page structure.

CO 2: Design web applications with variety of controls.

CO 3: Access the data using inbuilt data access tools.

CO4: Configure and deploy web application.

Unit	Content	Hours Allotted
1	Introduction 1.1 overview, Architecture, Features of .NET , 1.2 Meta data, CLR, Managed and unmanaged code 1.3 CTS, CLS, .NET base classes 1.4 Introduction to Visual Studio .NET IDE 1.5 Types of JIT compiler	15
2	Introduction To C# 2.1 Introduction to C#, Entry point method, command line arguments 2.2 Compiling and building projects, Compiling a C# program using command line utility, CSC.EXE, Different valid forms of main. 2.3 Global stack and heap memory, reference type and data type, casting implicit and explicit 2.4 Boxing and un-boxing, pass by value and pass by reference and out parameters 2.5 Partial class, DLL, Difference between DLL and EXE	15
3	Introduction to Web Programming 3.1 Understanding role of WEB server and WEB browser, HTTP request and response structure. 3.2 Introduction to ASP, Types of path, FORM tag 3.3 Types of server controls 3.4 Validation controls-Base validator, compare validator, range validator, grouping control validator 3.5 Web forms life cycle 3.6 Event handling in WEB forms, response.redirect, server.response, cross page post back property of button 3.7 ASP.NET state management 3.8 web.config, globalization and localization, AppDomain	15

4	ADO .NET 4.1 Introduction to ADO.Net 4.2 ADO.NET Architecture- Connction, command, dat reader, data adapter, data set 4.3 Understanding connected layaer of ADO.NET and disconnected layer of ADO.NET	15
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References:

1. ASP.NET: The complete reference book- By Mathew Macdonald
2. ASP.NET 4.5 in simple steps- By Kogent Learning Solution.
3. ASP.NET 4.5 Black Book- By Kogent Learning Solution.
4. C# and ASP.NET projects- By Shivprasad Koirala and Rajesh Pillai
5. Hands on with ASP.NET MVC- By Rahul Sahay.

B.C.A Part – III
Semester – V Part- III
Cloud Computing (BCA 1420E)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Understand the fundamental principles of Cloud Computing.

CO 2: Understand the importance of virtualization in distributed computing and how this has enabled.

CO3: Describe the principles of Parallel and Distributed Computing and evolution of cloud computing from existing technologies.

CO4: Implement different types of Virtualization technologies and Service Oriented Architecture systems

Unit	Content	Hours Allotted
1	Introduction to Cloud Computing 1.1 Introduction 1.2 Roots of Cloud Computing 1.3 Layers and Types of Cloud 1.4 Desired Features of a Cloud 1.5 Platform as a Service Providers 1.6 Architecture of cloud computing 1.7 Challenges in the cloud 1.8 Types of Cloud : Private, Public, Hybrid	15
2	Virtualization 2.1 Introducing virtualization and its benefits 2.2 Implementation Levels of Virtualization 2.3 Virtualization at the OS Model 2.4 Virtualization Structure: Hosted Structure, Bare-Metal 2.5 Structure Virtualization of CPU,Memory, and I/O Devices 2.6 Virtualization in Multicore Processors 2.7 Virtual Clusters and Resource management	15
3	Cloud Computing Services 3.1 Infrastructure as a Service 3.2 Platform as a servive 3.3 Leveraging PaaS for productivity 3.4 Guidelines for selecting PaasPovider 3.5 Concern with PaaS	15

	3.6 Language and PaaS 3.7 Software as a Service 3.8 Database as a Service 3.9 Specialized Cloud Services	
4	Cloud Computing Applications 4.1 Business Applications: MailChimp, Salesforce, Chatter, PayPal 4.2 Education Applications: Google Apps for 4.3 Education, Chromebooks for Education, Tablets with Google Play for Education 4.4 Entertainment Applications: Online games, Video Conferencing Apps, 4.5 Social Applications: Facebook, Twitter, LinkedIn	15

References:

1. Cloud Computing : Principles and Paradigms→ Rajkumar Buyya, James Broberg, Andrzej Goscinski, Willey Publication
2. Cloud Computing : Black Book→ Kailash Jayaswal, Jagannath Kallakurchi, Donald J. Houde, Dr. Deven Shah
3. Cloud Computing : Bible→ Barrie Sosinsky, Willey Publication
4. Cloud Computing : A Hands-On Approach→ Arshdeep Bahga, Vijay Madisetti

B.C.A Part – III
Semester – V Part- III
Computer Network (BCA 1421E)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. Define, use and implement Computer Networks and the basic components of a Network system.

CO2. Know and Apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use,

CO3. Able to transmit several simultaneous messages, and able to interconnect with other networks.

CO4. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

Module	Content	Hours Allotted
1	1Basics of Data communication 1.1. Data Communication concept 1.1.1 Components-sender, receiver, message, transmission media 1.1.2 Data Flow- simplex, half-duplex, or full-duplex 1.2 Networks 1.2.1 Definition, Advantages and disadvantages 1.2.2 Categories of Networks- LAN, WAN. MAN 1.2.3 Network Architecture-Client-Server and Peer to peer 1.3 Multiplexing and switching 1.3.1 Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Time-Division Multiplexing 1.3.2 Circuit switching, Packet Switching, Message Switching	15
2	Transmission media and Reference Models 2.1 Transmission Media 2.1.1 Guided Media - Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable 2.1.2 Unguided Media: Radio Waves, Microwaves, Infrared, satellite communication 2.2 Transmission Modes- Parallel and Serial -(Asynchronous, Synchronous) 2.3 Reference Models	15

	<p>2.3.1 OSI reference model</p> <p>2.3.2 TCP/IP reference model</p> <p>2.3.3 Comparison of OSI and TCP/IP reference model</p> <p>2.4 Protocol Standards</p> <p>2.5 IP address scheme and characteristics of IP address</p>	
3	<p>Data link, Network and Transport layer 12</p> <p>3.1 Data link Layer-</p> <p>3.1.1 Design issues</p> <p>3.1.2 Framing, error detection and correction</p> <p>3.2 Network layer</p> <p>3.2. 1 design issues of network layer</p> <p>3.2.2 Routing algorithm (shortest path, Flooding, distance vector,)</p> <p>3.2.3 Congestion control</p> <p>3.3 Transport layer</p> <p>3.3.1 Transport Layer Primitives: listen, connect, send, receive, disconnect</p> <p>3.3.2 Protocols: TCP, UDP</p>	15
4	<p>4 Session, Presentation and Application layer 12</p> <p>4.1 Session layer:</p> <p>4.1.1 Services: dialog management, synchronization, activity management, exception handling</p> <p>4.1.2 Remote procedure calls</p> <p>4.2 Presentation layer:</p> <p>4.2.1 Services: Translation, compression, encryption</p> <p>4.2.2 Cryptography: concept, symmetric key & asymmetric key cryptography</p> <p>4.3 Application layer:</p> <p>4.3.1 Function</p> <p>4.3.2 Domain name system (DNS), Hypertext Transfer Protocol (HTTP), Simple Mail Transfer Protocol (SMTP) ,Telnet, File Transfer Protocol (FTP)</p>	15

References:

1. Computer Networking :A top down approach , James Kurose Pearson
2. Computer Networks Tanenbaum, Pearson Education India
3. Network Warrior Gary A. Donahue ,O'Reilly
4. S. Keshav, *An Engineering Approach to Computer Networking.*
5. Douglas E. Comer, *Computer Networks and Internets*

B.C.A Part – III
Semester – V Part- III
Python Programming (1422E Elective 1)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.

CO 2: Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.

CO 3: Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.

CO 4: Identify the commonly used operations involving file systems and regular expressions.

Unit	Content	Hours Allotted
1	INTRODUCTION TO PYTHON Installation, Spyder IDE, Python Interpreter, History Of Python, Python Features, Applications Of Python, Data Types, Types Of Operators, Operators Precedence, Expressions, Statements, Functions, Comment, Strings - Accessing Values In Strings, Updating Strings, Escape Characters, Built-In String Methods, User Input	15
2	CONTROL FLOW AND LOOPS Conditionals: Boolean Values And Operators, Conditional (If), Alternative (If-Else) ,Chained Conditional (If-Elif-Else) Looping-While Loop, The Infinite Loop, For Loop, Iterating BySequence Index, Using Else Statement With Loops, Nested Loops, Break, Continue & Pass Statement. Functions: Function With Arguments, Lambda Functions	15
3	LISTS, TUPLES, DICTIONARIES AND SET Lists-Create a List, Get and Set Items ,Add and Remove Items, List Slices, Different List Methods TUPLES - Creation and Accessing Values, Updating Tuples, Deleting Tuple Elements, Basic Tuples Operations, Indexing, Slicing DICTIONARY- Accessing Values in Dictionary, Updating Dictionary, Delete Dictionary Elements, Properties of Dictionary Keys, Built-InDictionary Functions and Methods. SETS -Concept of Sets, Creating, Initializing and Accessing the Elements, Sets Operation.	15

4	MODULES, FILES I/O,GUI The Import Statement, Modules (Datetime, Calendar, Math Module) Files I/O: Text Files, Reading And Writing Files Introduction To GUI In Python	15
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References:

1. R. NageswaraRao, "Core Python Programming", Dreamtech
2. Practical Programming: An introduction to Computer Science Using Python, second edition, Paul Gries, Jennifer Campbell, Jason Montojo, The Pragmatic Bookshelf.
3. Programming with python, A users Book, Michael Dawson, Cengage Learning
4. Python Programming: An Introduction to Computer Science Paperback –
 - a. by John M Zelle.
5. Python Crash Course, 2nd Edition Paperback –by Eric Matthes.

B.C.A Part – III
Semester – V Part- III
R Programming (BCA 1422E Elective 1)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. Understand the fundamental syntax of R through practice exercises.

CO2. Describe the control statements and functions in R.

CO3. Analyze a data set in R and represent findings using the appropriate R packages.

CO4. Use data visualization tools.

Unit	Content	Hours Allotted
1	Introduction to R: Installation of R & RStudio, Features of R, Variables, Constants, Operators in R, Datatypes and R Objects, Accepting Input, Important Built-in functions, Creating Vectors, Accessing elements of a Vector, Operations on Vectors, Vector Arithmetic.	15
2	Control statements and functions: Control statements: if...else, if else() function, switch() function, repeat loop, while loop, for loop, break statement, next statement, Formal and Actual arguments, Named arguments, Global and local variables, Argument and lazy evaluation of functions, Recursive functions. Creating strings, paste(), Formatting numbers and string using format(), String manipulation	15
3	Matrices, Arrays and Data frames: Creating matrices, Accessing elements of a Matrix, Operations on Matrices, Matrix transpose, Creating arrays, Accessing array elements, Calculations across array elements, Introduction to data frames and basic operations on data frames	15
4	Introduction to Data Visualization: Data visualization basics, Installing and loading packages, importing data, Working with missing data, Extracting a subset of a data frame, Scatter Plot, Box Plot, Bar plot, Plotting categorical data, Stacked bar plot, Histogram, plot() function and line plot, pie chart / 3D pie chart.	15

References:

1. R Programming for Data Science Peng, R.D. (2020) Bookdown: New York.
2. An Introduction to Statistical Learning by Gareth James (2017) Publisher: Springer
3. R for Data Science by Garrett Golemund and Hadley Wickham, Publisher: O'Reilly Media, Inc. 2017.
4. R Fundamentals by Sosulski, K. (2018) Bookdown: New York.
5. Discovering Statistics Using R by Andy P. Field, SAGE Publications Limited

B.C.A Part – III
Semester – V Part- III
Digital Marketing (BCA 1423E Elective 1I)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Learn the applications of Digital Marketing

CO 2.: Analyze the different digital marketing avenues.

CO 3: Examine digital marketing tools.

CO 4: Build real life problems in the domain of digital marketing

Unit	Content	Hours Allotted
1	Digital Marketing: Introduction, Definition, Meaning and Scope, Advantages of digital Medium over other media, Digital Marketing Plan. Digital Marketing Strategy-POEM framework, .Digital consumer behavior.	15
2	Search Marketing :Introduction, Meaning, Types ,Basics of Search marketing, SEO-Working, Search Engine marketing (SEM) :Introduction, Meaning, Types of SEM, Difference between SEO and SEM, Overview of Google Ad words, Keywords research and analysis, Tracking the success of SEM Search Engine	15
3	Types of Digital Marketing 1.Mobile Marketing: Different kinds of mobile marketing, mobile marketing ecosystem 2. Social Media Marketing: Different social Media Channels, Social media for various businesses B2C& B2B, Measuring social media ROI 3. Content Marketing: story telling in Social media 4. E-Mail Marketing: The basics of Email marketing 5. Display Marketing: Different Kinds of Display marketing , The display Marketing ecosystem	15
4	Affiliate Marketing: Introduction, Meaning, Types of Affiliate Mktg., Future of Digital Marketing, Technological advancements in Digital Marketing, Practical Applications of Digital Marketing.	15

References:

1. Gupta Seema.-Digital Marketing, McGraw Hill Education (India) Pvt. Ltd.
2. Ahuja Vandana-Digital Marketing, Oxford University Press, 2015.
- 3.MohammedR., – InternetMarketing,McGrawHill,NewYork,Vol.4,2001
4. Krishnamurthy,S.&Singh,N.(2005),TheInternationalE-MarketingFramework(IEMF)

B.C.A Part – III
Semester – V Part- III
Management Information System (BCA 1423E Elective 1I)

Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Understand the fundamental principles of information systems

CO 2: Describe the types of management and decision making

CO 3: Demonstrate different types of IS used in business.

CO 4: Explain various applications of MIS

Unit	Content	Hours Allotted
1	Introduction to Information System Introduction to systems- definition, need, types, characteristic Definition of Information Classification of Information Need and importance of information system Definition and Characteristics of information system Role of information system in business	15
2	Decision Making Decision Making Concepts, and Process, Types of Decisions Behavioral Concepts in Decision Making Organizational Decision-Making MIS and Decision Making	15
3	Types of Information System Introduction Operational and Knowledge Level- TPS (Transaction Processing System), OAS (Office Automation System), KWS (Knowledge Work System) Management and Strategic Level- MIS (Management Information System)-need characteristics, DSS (Decision Support System)-need, characteristics, components, ESS (Executive Support System)-need, characteristics	15
4	Applications of MIS Financial Information System Human Resource Information System Production Information System Marketing Information System	15

References:

1. W. S. Jawadkar, Management Information Systems, 4th edition, McGraw Hill.
2. Ramesh Behl , James O' Obrien and George M. Marakas, Management Information Systems, 10th edition, McGraw Hill edition.
3. DR. Milind M. Oka. , Management Information Systems , Everest Publishing House

B.C.A Part – III
Semester – V Part- III
Lab Course based on ASP.Net with C# and DSE (BCA 1424 E)
Theory: 00 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. An ability to design implements and evaluate a computer-based system, process, component or program to meet desired needs.

CO2. An ability to use current techniques, skills and tools necessary for computing practice

CO3. To read and write simple python programs.

CO4. Ability to explore python especially the object oriented concepts and the built-in objects of python

Sr. No.	Content
1	Accept your Name in TextBox1 and check it not greater than 10 character, print appropriate message using if.. else.. Accept Fee in TextBox2 and check Fee should be in number and ≥ 16000
2	Write a console program to accept a single alphabet and convert it into lower if it is upper and vice versa
3	Write a Console Program to accept number from lower to limit to higher limit 10 numbers in integer array and print all the divisors of 12
4	Write a console program to convert entered days into years, weeks and days
5	Write a console program to calculate area of sphere by using function
6	Write a program to accept a lower or upper alphabet check it is vowel or consonant using switch Statement
7	Write a console program to declare and initialize as string ="Fox jump over the lazy dog" And count total words in the string.
8	Write a Console program to accept 5 integer numbers in an array and find sum and average of elements And then count total elements below average and above average
9	Write a console program to accept year and check it is leap or not.
10	Write a console program to accept 5 elements in an integer array and find minimum and maximum element in it.
11	Write a console program to write a function Add with 2 integer numbers as parameter having return type int and call it in Main() method to display sum of 2 numbers.
12	Create Employee form to accept EmpNO, Name, Designation, Salary. Using ADO create connectively to add records in database table Emp. Take 2 buttons Submit and Clear button
13	Write a console program to accept base and index as integer and find power($p=23=8$) without using built-in math functions

B.C.A Part – III
Semester – V Part- III
Mini Project (BCA 1425E)
Theory: 00 Teaching Hours Credits – 4

The group of students may undertake a software project in consultation with the internal guide. The group size should not exceed four students. The student is expected to do project in any language studied in 5th or earlier Semesters. The mini Project will be evaluated by the external examiners appointed by University.

B.C.A Part – III
Semester – V Part- III
Mini Project (BCA 1425E)
Theory: 00 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Understood what soft skill is.

CO 2: Understood the significance of soft skills in the working environment.

CO 3: Developed levels in their soft skills.

CO 4: Able to build Employability skills with time and resource management.

Unit	Content	Hours Allotted
1	Soft Skills: Introduction and Importance; Difference between Hard skills and Soft Skills; Need of Soft Skills at the Workplace; Soft Skills for Professional Excellence: Communicative Skills, Critical Thinking and Problem Solving Skills, Team Work, Attitude- steps to build a Positive Attitude, Leadership skill, Time Management- Pareto's Principle; Stress Management	15
2	Personality Development: Introduction and Importance; Discovering Oneself, SWOT Analysis; Developing Interpersonal Relationships- ways to build Strong Inter Relationships; Etiquette and Manners- Professional Etiquette, Email Etiquette and Telephonic Etiquette ,Dressing, Grooming and Body Language; Group Discussion Expectations of the Panel, Do's & Don'ts in a Group Discussion: Differences between Group Discussion and a Debate ; Resume Building; Facing The Personal Interview	15

B.C.A Part – III
Semester – VI Part- III
Data Warehousing and Data Mining (BCA 1426F)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:
CO1. Define the Data warehouse architecture and its Implementation.
CO2. Describe the Architecture of a Data Mining system.
CO3. Understand the various Data preprocessing Methods.
CO4. Perform classification and prediction of data

Unit	Content	Hours Allotted
1	Data Warehousing: Introduction to data warehousing, Data warehousing components, Building a data warehouse, Difference between database system and data warehouse, Data warehouse architecture	15
2	Data Mining: Introduction of data mining - Definition and functionalities Issues in DM, Applications of data mining, KDD process. Data Pre-processing: Data Pre-processing, Data cleaning, Data integration and transformation, Data reduction, Discretization and concept hierarchy generation, Data mining Tasks	15
3	Data Mining techniques: Frequent item - set and association rule mining: apriori algorithm, use of sampling for frequent item- set tree algorithm, Graph sampling : frequent sub graph mining , tree mining ,sequence mining Classification and Prediction - Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification -Prediction – Accuracy and Error Measures .	15
4	Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods – K-Means and K-Medoids	15

References:

1. Kimball, Ralph & et al, The Data Warehouse Lifecycle Toolkit, John Wiley & Sons, 2006.
2. Jiawei Han and Micheline Kamber : “Data Mining Concepts and Techniques”, 3rd Edition, Elsevier, 2012.
3. Arun K. Pujari, "Data Mining", University Press.
4. Paulraj Ponnian, “Data Warehousing Fundamentals”, John Willey

B.C.A Part – III
Semester – VI Part- III
Data Warehousing and Data Mining (BCA 1426F)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

- CO1. Understand the features of Java Language
- CO2. Demonstrate Object-Oriented Programming using Java
- CO3. Develop Multithreaded and Networking applications
- CO4. Design GUI applications using AWT and Swing.

Unit	Content	Hours Allotted
1	Java Fundamentals Introduction to Java, History and Features of Java, C++ vs Java, Simple Java Program, Internal path setting, JDK, JRE, and JVM (Java Virtual Machine),JVM Memory Management, data types, Unicode System, Operators, Keywords, and Control Statements, methods, constructor, class,objects,methods,Accessmodifiers,statickeyword,finalkeyword,STRING Manipulation,Array	15
2	Inheritance, Polymorphism and Encapsulation Inheritance in Java, Is-A Relationship, Aggregation and Composition(HAS-A),Types of inheritance, this & super keyword Polymorphism in Java, Types of polymorphism, Static and Dynamic Binding, Abstract class and method	15
3	Package, Multithreading and Exception handling Defining & create packages, system packages, Introduction of Exception, Pre -Defined Exceptions, Try-Catch-Finally, Throws, throw, User Defined Exception examples, Multithreading- introduction, Thread Creations, Thread Life Cycle, Life Cycle Methods, Synchronization, Wait() notify() notify all() methods	15
4	AWT,SWING (JFC) Introduction and Components of AWT, Event-Delegation Model, Listeners, Layouts, Individual Components Label, Button, Check Box, Radio Button, Introduction Diff B/W AWT and SWING, Components hierarchy, Panes, Individual Swings components J Label, JButton, JText Field, JTextArea	15

References:

1. Java - The Complete Reference-Author - Herbert Schildt, Latest Edition - 11th Edition, Publisher - McGraw Hill Education
2. The Complete Reference-Herbert Schildt
3. Core Java An Integrated Approach (Black Book)- Dr. R. NageswaraRao
4. Head First Java, 2nd Edition A Brain-Friendly Guide, 2Nd Edition (Covers Java 5.0)

5. Core Java 1.1 Volume 1: Fundamentals (Sunsoft Press Java Series)

B.C.A Part – III

Semester – VI Part- III

Internet of Things (BCA 1428F Elective 1)

Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: To design some IOT based prototype.

CO 2.: Analyze the different digital marketing avenues.

CO 3: Examine digital marketing tools.

CO 4: Build real life problems in the domain of digital marketing

Unit	Content	Hours Allotted
1	Fundamentals of IoT Overview of basic electronics and basic components used in electronics lab: Resistors, Capacitors, Diodes, Transistors, Overview of digital electronics: Logic Gates and Families, Arithmetic circuits, Decoders, Multiplexers, flip flops, Shift Register, Integrated Circuits, Overview of Microprocessor and Microcontroller, Common features of Microcontroller.	15
2	IoT Environment Introduction to embedded system: History, Classifications and applications of embedded systems, Design principals of IoT architecture, Outline of IoT architecture, Various platforms of IoT, Key features of IoT, IoT Hardware, IoT Software, IoT protocols, Real time examples of IoT, Advantages of IoT, Challenges of IoT.	15
3	Introduction to Arduino Arduino Uno architecture, Pin configuration and architecture, Device and platform features, Concept of digital and analog ports, Familiarizing with Arduino Interfacing Board, Arduino IDE Interfacing basic hardware components with Arduino, Software and Libraries	15
4	IoT Application Development Arduino data types, Variables and constants, Operators, Control Statements, Arrays, Functions, Arduino i/o Functions: Pins Configured as INPUT, Pullup Resistors, Pins Configured as OUTPUT, pinMode() Function, digitalWrite() Function, digitalWrite() Function, digitalRead() Function, digitalWrite() Function, analogRead() function, analogWrite() function, Arduino time Functions: delay() function, delayMicroseconds() function, millis() function, micros() function, Working with Serial Monitor.	15

References:

1. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things Key applications and Protocols", Wiley, 2012.
2. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014
3. Cuno Pfister, Getting Started with the Internet of Things, O'Reilly Media, 2011, ISBN: 978-1-4493-9357-1
4. Arduino, The complete guide to Arduino for beginners, including projects, tips, tricks, and programming!, James Arthur, 2020
5. Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects Michael Margolis, Brian Jepsen, Nicholas Robert Weldin, O'Reilly, 3rd Edition, 2020

B.C.A Part – III
Semester – VI Part- III
Android Programming (BCA 1428E Elective 1)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1: Understand the building blocks of Mobile Operating Systems

CO2: Analyze different elements of Android Development Environment

CO3: Illustrate the structure of Mobile Applications using Android

CO4: Identify different components used in Mobile Applications using Android

Unit	Content	Hours Allotted
1	Introduction to Mobile Operating System Mobile operating system, Operating system structure, Constraints and Restrictions, Features: Multitasking Scheduling, Memory Allocation, File System Interface, Keypad Interface, I/O Interface, Protection and Security, Multimedia features. Brief history of Android, Different types of mobile applications	15
2	Android Development Environment Introduction to Mobile development IDE's, Setting up development environment, Android Software Development, Working with the AndroidManifest.xml, Dalvik Virtual Machine & .apk file extension, Android Architecture, Building a sample Android application using Android Studio. Android Project Structure, Working with emulator	15
3	Android Application Framework Layouts & Drawable Resources, Basic Building blocks - Activities and Activity lifecycle, UI Components - Views & Notifications, Components for communication -Intents & type of Intents, Android API levels (versions & version names), Developing sample Application	15
4	Basic UI design Form widgets, Text Fields, Layouts, Option menu, Context menu, Sub menu, Time and Date, Images and media, Composite, Alert Dialogs & Toast, Popup, Introduction to SQLite Programming, SQLite Database.	15

References:

1. AnubhavPradhan, Anil V Deshpande, " Mobile Apps Development" Edition:I
2. Teach Yourself Android Application Development In 24 Hours, Edition:I, Publication: SAMS
3. Jeff McWherter, Scott Gowell "Professional Mobile Application Development", John Wiley & Sons, 2012.
4. Barry Burd, "Android Application Development All in one for Dummies", Edition:I

B.C.A Part – III
Semester – VI Part- III
M-Commerce (BCA 1429F Elective 1I)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. Interpret the impact and challenges posed by IOT networks leading to new architectural models.

CO2. Illustrate the smart object and technologies to connect them to network.

CO3. Compare different applications protocol for IOT.

CO4. Infer the role of data analytics and security in IOT.

Unit	Content	Hours Allotted
1	E-Commerce Introduction, meaning and definition of E-Commerce, Brief history of Ecommerce, Need of Ecommerce, Advantages and limitations of e-commerce, Role of ecommerce in industries, Requirements of E-Commerce, Scope of E - Commerce, , E-commerce Models(B2B,B2C,C2B,C2C,B2G,G2B)	15
2	Mobile Commerce Introduction, scope of mobile – commerce, applications of m-commerce, . Principles of mobile commerce, benefits of mobile commerce, limitations of mobile commerce, E-commerce vs. M-commerce Real time examples of IoT, Advantages of IoT, and Challenges of IoT.	15
3	Mobile Commerce: Theory and Applications The Ecology Of Mobile Commerce – The Wireless Application Protocol – Mobile Business Services – Mobile Portal – Factors Influencing The Adoption of Mobile Gaming Services – Mobile Data Technologies And Small Business Adoption And Diffusion – E-commerce in The Automotive Industry – Location-Based Services: Criteria For Adoption And Solution Deployment – The Role of Mobile Advertising In Building A Brand – M-commerce Business Models	15
4	Mobile Commerce Security Introduction to Web security, Security threats in M-commerce, Control measures in mobile commerce. (Firewalls & Transaction Security. Multilevel authentications) Security Challenges in M -Commerce	15

References:

1. P. J. Louis, "M-Commerce Crash Course", McGraw- Hill Companies February 2001.
2. Paul May, "Mobile Commerce: Opportunities, Applications, and Technologies Of Wireless Business" Cambridge University Press March 2001.
3. Gary Schneider, Electronic Commerce, Thomson Publishing. ISBN-10: 1-4239-0305-6
4. Pandey, Srivastava and Shukla, E-Commerce and its Application, S. Chand
5. P.T. Joseph, Electronic Commerce - An Indian Perspective, P.H.I Bharat Bhaskar, Electronic Commerce, TMH

B.C.A Part – III
Semester – VI Part- III
M-Commerce (BCA 1429F Elective 1I)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Understand concept, need and significance of ERP.

CO 2: Demonstrate different ERP models with their subsystem

CO 3: Evaluate features of ERP products, select ERP application and plan ERP project.

CO 4: Describe organizational opportunities and challenges in the design system within a business scenario.

Unit	Content	Hours Allotted
1	Business Process Reengineering: Meaning and definition of BPR, Need of BPR , Business process, BPR Phases	15
2	Introduction to ERP: Introduction ,concept and definition of ERP, direct and indirect benefits of ERP, ERP Evolution, Conceptual Model of ERP, ERP models and subsystems	15
3	ERP Implementation: ERP implementation life cycle, ERP implementation phases Selection criteria of ERP, role of consultant in ERP implementation, ERP implementation strategies, costs in ERP implementation, Critical success and failure factors of ERP implementation.	15
4	ERP Marketplace Dynamics: Market Overview, Marketplace Dynamics, the Changing ERP Market. Introduction to SAP and Oracle ERP packages with their key features and subsystems.	15

References:

1. Alexis Leon, "ERP Demystified", Tata McGraw Hill
2. Rahul V. Altekar "Enterprise Resource Planning", Tata McGraw Hill,
3. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning - A Concepts and Practice", PHI
4. Mary Summer, "Enterprise Resource Planning"- Pearson Education

B.C.A Part – III
Semester – VI Part- III
Lab I Course XI Based on DSE (Java Programming) (BCA 1430F)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO 1: Implement the Concept of OOP in Java through simple programs.

CO 2: Implementation and Evaluation of concept related to class and inheritance, concept of Multiprogramming and Exception Handling

CO 3: To write programs for solving real world problems.

CO 4: To write multithreaded programs

Sr No.	Content
1	Java programs based on command line arguments
2	Java programs based Type Casting
3	Java programs based on branching and looping statements
4	Java programs based on constructors
5	Java programs based on method overloading
6	Java programs based on interfaces
7	Java programs based on inheritance
8	Java programs based on packages
9	Java programs based on multithreading
10	Java programs based on exception handling
11	Java programs with applets.

B.C.A Part – III
Semester – VI Part- III

Lab II Course XI Based on DSE (Android Programming) (BCA 1431F)

Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. Design Mobile Applications using different UI components in Android.

CO2. Apply Android Application Framework to develop mobile application

CO3. Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

CO4. Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes

Sr No.	Content
1	Create android application to display Hello World message.
2	Create android application to demonstrate Activity Life Cycle.
3	Create android project to design one activity using different controls. Text View, Edit Text Button, Image View
4	Create Android Application to demonstrate following layouts: Linear Layout, Relative Layout, Relative Layout, and Table Layout
5	Display toast message after click button.
6	Create simple arithmetic calculator in android.
7	Enter your name on one activity and display it on another activity.
8	Create Android application to demonstrate Alert dialog.
9	Create Android application to demonstrate popup
10	Create one activity in your android application to implement all CURD operations on SQLite database. (Take any database example)

B.C.A Part – III
Semester – VI Part- III
Major Project (BCA 1432F)
Theory: 60 Teaching Hours Credits – 4

- A group of maximum four students prepare a major project under the guidance of internal teacher.
- Project report will be evaluated by the internal teacher out of 20 marks and there will be viva-voce examination for 80 marks.
- (Documentation – 20 Marks, Online Presentation-- 30 Marks, Viva-Voce -- 30 Marks.)
- The panel for viva-voce examination will be appointed by university. The student should prepare the project report on the work carried out as a project in semester VI.
- **Guidelines for Project:**
- Number of Copies: The student should submit two Hard-bound copies of the Project Report. Acceptance/Rejection of Project Report:
- The student must submit an outline of the project report to the college for approval. The college holds the right to accept the project or suggest modifications for resubmission. Only on acceptance of draft project report, the student should make the final copies.

Format of the Project Report:

The student must adhere strictly to the following format for the submission of the Project Report.

a. Paper:

The Report shall be typed on white paper, A4 size, for the final submission. The Report to be submitted to the must be original and subsequent copies may be photocopied on any paper.

b. Typing:

The typing shall be of standard letter size, 1.5 spaced and on one side of the paper only. (Normal text should have Arial Font size 11 or 12. Headings can have bigger size)

c. Margins:

The typing must be done in the following margins:

Left -----1.5 inch, Right ----- 1 inch

Top ----- 1 inch, Bottom ----- 1 inch

d. Front Cover:

The front cover should contain the following details:

TOP : The title in block capitals of 6mm to 15mm letters.

CENTRE: Full name in block capitals of 6mm to 10mm letters.

BOTTOM: Name of the University, Course, Year of submission -all in block capitals

of 6mm to 10mm letters on separate lines with proper spacing and centering.

f. Blank Sheets:

At the beginning and end of the report, two white black bound papers should be provided, one for the purpose of binding and other to be left blank.

Documentation Format

- a) Cover Page
- b) Institute/ College Recommendation
- c) Guide Certificate
- d) Declaration
- e) Acknowledgement
- f) Index
- g) Chapter Scheme
 - 1) Introduction to Project
 - Introduction
 - Existing System
 - Need and scope of Computer System
 - Organization Profile
 - 2) Proposed System
 - Objectives
 - Requirement Engg.
 - Requirement Gathering
 - SRS
 - 3) System Analysis
 - System Diagram
 - DFD
 - ERD
 - UML(if applicable)
 - 4) System Design
 - Database Design
 - Input Design
 - Output Design
 - 5) Implementation
 - System Requirement
 - Hardware
 - Software
 - Installation process
 - User Guideline
 - 6) Output(with valid Data)
(Minimum 6 reports)
 - 7) Conclusion and Suggestions
 - Conclusion
 - Limitations
 - Suggestion
 - 8) References:-
 - i) Books:-
 - ii) Journals:-

- iii) Periodicals and Newspapers:-
- iv) Web
- v) Questioner/Schedule(if used)
- vi) Source code(Include Main Logic source code)

B.C.A Part – III
Semester – VI Part- III
Industrial Visit (BCA 1433F)
Theory: 60 Teaching Hours Credits – 4

Course Outcomes - At the end of this course students will be able to:

CO1. Interact and learn from experts in the industry.

CO2. Open new venues for learning by seeing.

CO3. Improve their job prospects.

CO4. Learning management concepts.

Industrial Visit Report
Industrial visit report may include following- Company Profile Objectives of visit Observations Details of Journey Photographs at company location Visit outcomes

Evaluation Pattern

QUESTION PAPER PATTERN FOR ALL SEMESTERS

Duration: 3Hours

Total Marks -70

Instructions:

- 1) Que.1 and Que.8 are compulsory and attempts any four Questions from Que. No.2 to Que. No.7.
- 2) Figures to the right indicate marks.

Q.1) Five MCQ / Short answer Questions / Match the Pairs	05
Q.2) Broad answer question	14
Q.3) Broad answer question	14
Q.4) Broad answer question	14
Q.5) Broad answer question	14
Q.6) Broad answer question	14
Q.7) Broad answer question	14
Q.8) Write notes on (Any three out of five)	09

Note: Que.2 to Que.7 may contain sub-questions (A) & (B) carrying 7 marks each.

1. Nature of Practical Question Paper:

There will be three questions of 15 Marks each, out of which student have to attempt any two Questions and 10 marks for journal and 10 marks for oral for 2 credit lab course and time duration is three hours.

2. Internal Marks Distribution:

- Ten Marks for Tests. (Two test of 10 Marks would be conducted and convert these marks to Ten marks.)
- Ten Marks for designing apps or software or working model/ Field Work/online learning activity or Home Assignment etc.
- Five Marks for Oral.
- Five Marks for Department activity participation and Attendance.(75% to 80%- 02 marks, 81% to 85 %- 03 marks, 86% to90%- 04, marks 91% to 100% - 5 mark)