SHIVAJI UNIVERSITY, KOLHAPUR - 416004,
MAHARASHTRA
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शिवाजी विद्यापीठ, कोल्हापूर -४१६००४,महाराष्ट्र
दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दुरध्वनी ०२३१—२६०९०९४

Estd. 1962
"A++" Accredited by
NAAC (2021)
With CGPA 3.52

Ref../SU/BOS/Com & Mgmt./ 211 **Date : 10/04/2024**

To,

The Principal
All Affiliated (Commerce & Management) Colleges/Institutions,
Shivaji University, Kolhapur

Subject : Regarding Syllabi of BCA Part-III (Sem-V/VI) Choice Based Credit System (CBCS) degree programme under the Faculty of Commerce & Management as per National Education Policy, 2020

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi of **BCA Part-III (Sem-V/VI) Choice Based Credit System (CBCS)** under the Faculty of Commerce & Management as per National Education Policy, 2020

This syllabi shall be implemented from the academic **year 2024-2025** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (Student - Online Syllabus).

You are therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

(Dr. S. M. Kubal)
Dy. Registrar

Encl : As above

Copy to,

1. Dean, Faculty of Commerce & Management
2. Chairman, Board of Studies

} for information

3. Director, BOEE
4. Appointment Section
5. P. G. Admission Section
6. B.Com and O. E. 1 Section
7. Affiliation Section (U.G./P.G.)
8. Computer Center/I.T.
9. Eligibility Section
10. Distance Education
11. P.G. Seminer Section

} for information and necessary action.

SHIVAJI UNIVERSITY, KOLHAPUR.

Estd. 1962

NAAC "A++" Grade

Faculty of Commerce and Management

Syllabus For

BCA Part III (Sem V & VI) (CBCS) NEP 2020

(To be implemented from June 2024 onwards)

(Subject to the modifications that will be made from time to time)

Shivaji University Kolhapur

BCA Part III Draft Syllabus w.e.f. June 2024-25

BCA-III (Sem-V) NEP 1.0

Course Code	Title of Paper	Credit	Internal	External	Total
CC 501	Java Programming	4	20	80	100
CC 502	Data Warehousing and Data Mining	4	20	80	100
CC503	Dot NET Technology	4	20	80	100
DSE 504	Elective-I 1. Web Content Management (WordPress/Joomla) 2. Emerging Trends in Data Base 3. Linux	4	20	80	100
GE 505	Elective-II 1. Digital Marketing 2. Management Information System 3. E-Commerce	4	20	80	100
SEC SB 506	Skill Development IV	2	50		50
CCL 507	Lab Course-IX Based on CC501	2	-	50	50
CCL 508	Lab Course-X Based on DSE504& 503	2	-	50	50
		26	150	500	650

Course Code: CC 501	B.C.A Part-III (Sem-V) NEP 1.0 Java Programming	Credit:-4	Marks 100
	Total Hours of Teaching: 60	External :80	Internal:20
Course Outcomes:	The student will be able to: 1. Understand the features of Java Language 2. Demonstrate Object-Oriented Programming using Java 3. Develop Multithreaded and Networking applications 4. Design GUI applications using AWT and Swing.		
Unit No.	Description		No. of Periods
1	**Java Fundamentals** Introduction to Java, History and Features of Java, C++ vs Java, Simple Java Program, Internal path seting, 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, Interface, Encapsulation in Java, Getter and setter method in Java.		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
	Reference Books: 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		

Course Code: CC502	B.C.A Part-III (Sem-V) NEP 1.0 Data Warehousing and Data Mining	Credits:04	Marks: 100
	Total Hours of Teaching: 60	External :80	Internal:20
Course outcome	After completion of this course students will be able to 1. Define the Data warehouse architecture and its Implementation. 2. Describe the Architecture of a Data Mining system. 3. Understand the various Data preprocessing Methods. 4. Perform classification and prediction of data		
Unit No.	Descriptions		No. of Periods
1	Data Warehousing: Introduction to data warehousing, Data warehousing components, Building a data warehouse, Difference between database system and data warehouse, Data warehouse architecture-3 Tier architecture, Warehouse schema design, Data extraction, Cleanup& transformation tools, Multi-dimensional data model, Data cubes- Stars, Snowflakes, Fact constellations, Concept hierarchy, Online analytical processing-		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		15
4	Classification and Prediction - Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification Prediction – Accuracy and Error Measures. 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 MichelineKamber : “Data Mining Concepts and Techniques”, 3rd Edition,Elsevier,2012. 3. Arun K. Pujari, "Data Mining",University Press. 4. PaulrajPonnian, “Data Warehousing Fundamentals”, John Willey.		

Course code: CC 503	**B.C.A Part-III (Sem-V) NEP 1.0 DOT NET Technology**	**Credit :04**	**Marks:100**
	Total Hours of Teaching: 60	External :80	Internal:20
Course Outcomes	After completion of this course student should be able to- 1. Understand features of C# DOT NET 2. Implement various server controls for website development 3. Apply validation and state management for interactive website development 4. Design and develop dynamic web application using ADO.Net		
Unit No.	Description		No. of Periods
1	Introduction to .NET Framework Overview of .NET, Features of .NET, Managed and unmanaged code, Meta Data , .NET types and .NET object and name spaces Architecture of DOT NET Framework: CLR, CTS, MSIL, JIT, CLS, FCL , Types of JIT , Visual studio .NET IDE		15
2	C# Basics Introduction to C# , Entry point method, command line arguments, Different valid forms of main(), Difference between .Exe and .DLL, Parameter Passing mechanism, Out parameter Data types , Type Casting, Boxing & Unboxing, Partial class and implementation, Control structures		15
3	ASP .NET Asp.Net Server controls , Web form lifecycle, Validtion controls, Navigation controls , Response.redirect, server.response,, Cross page posting , State Management		15
4	ADO.NET Data Controls in ASP.Net, ADO.Net Classes-Connection, Command, DataReader, DataAdapter,Dataset, Connected and Disconnected architecture, Data binding using ADO.net , Report generation, simple and parameterized reports		15
	Books Recommended: 1. ASP .NET-The Complete Reference Tata MacGraw Hill 2. ASP.NET 4 Unleashed by Stephen Walther, Kevin ScottHoffman, Sams Publishing 3. Bill Evjen, Professional ASP.NET 3.5 in C# and VB, WroxPublication 4. Kogent Solutions, C# 2008 Programming covers. NET 3.5 (BlackBook), Dreamtech Press 5.Microsoft ASP.NET 4.0 Step by Step - George Shepherd, Microsoft Press 6. Mastering ASP.Net - BPB Publication 7. ASP.net – The Complete Reference- Tata McGraw Hill 8. ASP.NET Programming – Murach 9. ASP.NET 4.0 Programming- Joydip Kanjilal		

Course code: DSE 504.1	B.C.A Part-III (Sem-V) NEP 1.0 Web Content Management (WordPress/Joomla)	Credits: 4	Marks:100
	Total Hours of Teaching: 60	External:80	Internal :20
Course Outcomes	By the end of this course, the students should be able to: 1. Understand different CMS platforms and its applications 2. Apply themes and customize design for the websites using Wordpress 3. Understand the essential concepts of Joomla and its features 4. Develop and manage a web site using Joomal Modules and Templates		
Unit No.	Description		No. of Periods
Unit 1	**Introduction to Content Management System and Wordpress** Introduction, Features, Advantages, Disadvantages, Types of CMS and its Applications, Basics of Blogging, Comparison with other web technologies , Introduction and Installation Introduction of WordPress, Advantages & Disadvantages of WordPress, WordPress.com vs WordPress.org, Installation of WordPress, Directory ; file structure		15
Unit 2	**Overview of Wordpress** Dashboard overview, working with page, category, post, tags, and media, User Roles and Responsibilities, Modifying Settings (General, Reading, Writing, Discussion, Media, Permalinks), Database Structure, Overview of Cascading Style Sheets (CSS), Installing new themes, Using CSS to move and position web graphics, Blogging with WordPress, To setup Blogging site		15
Unit 3	**Joomla** Joomla Basics, Installing WAMP Server, Installing Joomla on Web Server, Joomla Admin, Joomla global configuration, Article manager, Archive manager, FrontPage manager, Section manager, Category manager, Media Manager, Menu manager, Component manager , Content Manager, Extensions manager, Module manager, Plugin manager, Template manager, Understanding the concept of joomla positions, Changing the layout structure by changing the module position.		15
Unit 4	**Joomla Frontend** Understanding Basic Joomla Template, Customizing joomla template-Building Custom Joomla Template, Understanding Template details.xml File, Creating Templatedetails.xml File using tmpl_builderLinking Css-Linking JavaScript-Understanding Include-Displaying Content in xhtml-Creating Template installation Package-Creating Custom Forms Changing the Form Appearance using CSS		15
	Reference Books: 1. Dr. Andy Williams, WordPress for Beginners 2020: A Visual Step-by-Step Guide to Mastering WordPress 2. Lisa Sabin–Wilson, C WordPress All–in–One for Dummies 3. Brad Williams, David Damstra, Ham Stern Professional WordPress Design and Development 4.Using Joomla ! Author: Ron Severdia, Jennifer Gress. 5.The Official Joomla! Book Publisher: Pearson Education		

Course code: DSE 504.2	**B.C.A Part-III (Sem-V) NEP 1.0 Emerging Trends in DataBase**	**Credits: 4**	**Marks:100**
Marks:100	Total Hours of Teaching: 60	External:80	Internal :20
Course Outcomes	By the end of this course, the students should be able to: 1. Differentiate between SQL and NoSQL database system. 2. Analyze given data using MongoDB. 3. Understand the different types of Cloud databases 4. Identify emerging trends in database management:		
Unit No.	Description		No. of Periods
1	Introduction to NoSQL Introduction to NoSQL database, Types of NoSQL database, NoSQL data modeling, Benefits of NoSQL database, Comparison between SQL and NoSQL database system, NoSQL using MaongoDB.		15
2	Working with MongoDB Introduction to MongoDB shell, Basic data types, Running the MongoDB shell, MongoDB Client, ,Basic operations with MongoDB shell, Arrays, querying with MongoDB, find function, OR queries, Types specific querying, Aggregation in MongoDB.		15
3	Cloud databases Introduction, Types of cloud databases- Relational cloud databases, NoSQL cloud databases, In-memory databases, Working of cloud Database, Benefits and challenges of cloud databases		15
4	Emerging trends in database management: Self-driving databases, Augmented database Management systems, Analytic databases, Graph databases, Bridging SQL and NoSQL		15
	Reference Books 1. Professional NoSQL, Shashank Tiwari, 2011, Wiley 2. Teach yourself NoSQL with MongoDB in 24 Hours, Brad Dayley, Sams 3. MongoDB Data Modeling and Schema Design by Daniel Coupal, Pascal Desmarets, et al., 4. MongoDB Applied Design Patterns: Practical Use Cases with the Leading NoSQL Database (Greyscale Indian Edition) by Rick Copeland		

Course code: DSE 504.3	B.C.A Part-III (Sem-V) NEP 1.0 Linux	Credits: 4	Marks:100
	Total Hours of Teaching: 60	External:80	Internal : 20
Course Outcomes	By the end of this course, the students should be able to: 1. Understand the basic components of Operating Systems and their interactions. 2. Explain the structure and functions of operating systems along with their components, types and working. 3. Understand the basics of File, Device and Disk Storage Management in Linux 4. Learn Shell Programming through Linux		
Unit No.	Description		No. of Periods
1	Introduction to Operating System Operating system, Types of operating system, Functions of operating system, History and development of Linux, Features of Linux , Login , logout procedure, Concept of shell, kernel, Kernel-shell relationship		15
2	Handling files and directory's Concept of file, types, file system tree, Different GPU (clear ,cal , date, wc, who), file handling- ls ,cat ,cp, mv , rm commands , listing file names, using meta characters (* , ? ,[ ]), Concept of directory , home directory , directory handling commands- cd , mkdir, rmdir,pwd., Basic file attributes, change file/directory, chmod command, Filters- cut, paste, sort, unique, head, tail, grep commands., Command linking using pipe (|) operator, command substitution.		15
3	VI editor Vi Editor, use of VI , features of VI, Different modes and working with VI editor , Command mode -cursor movements(k,j,h,l), delete(character, line, word), Screen up , down, use of repeat factor , joining lines (J), searching for pattern (/ and ?), Input mode- switching with (I,o,r,s,a,I,O,R,S,A), ex mode – saving (w, x, q)		15
4	Simple Shell programming Concept of Shell Script, running a shell script, Statements – read , echo, test , if, case , exit., Loops- while, until, for Command line arguments, Exit status of a command		15
	Reference Books 1. Unix concept and applications Sumitabha Das 2. Unix shell programming- Yashwant Kanetkar 3. Linux programming- Foreword By- Alan Cox 4. RedHat Linux By Bill Ball , David Pitts		

Course Code: GE505.1	B.C.A Part-III (Sem-V) NEP 1.0 Digital Marketing	Credit: 04	Marks:100
	Total Hours of Teaching: 60	External :80	Internal : 20

Course Outcomes	At the end of the course the student should be able to: 1. Learn the applications of Digital Marketing 2. Analyze the different digital marketing avenues. 3. Examine digital marketing tools. 4. Build real life problems in the domain of digital marketing	
Unit No.	Description	No. of Periods
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 behaviour.	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 Affliate Mktg., Future of Digital Marketing, Technological advancements in Digital Marketing, Practical Applications of Digital Marketing.	15

Books Recommended:

1. Gupta Seema.-Digital Marketing, McGraw Hill Education(India) Pvt. Ltd.
2. AhujaVandana-Digital Marketing, Oxford University Press, 2015.
3. Mohammed R.,—InternetMarketing, McGrawHill,NewYork,Vol.4,2001
4. Krishnamurthy, S. & Singh,N. (2005), The International E-Marketing Framework(IEMF)

Course code: GE505.2	B.C.A Part-III (Sem-V) NEP 1.0 Management Information System	Credit:04	Marks:100
	Total Hours of Teaching: 60	External :80	Internal : 20
Course Outcomes	After completion of this course students will be able to- 1. Understand the fundamental principles of information systems 2. Describe the types of management and decision making 3. Demonstrate different types of IS used in business. 4. Explain various applications of MIS		
UNIT No.	Description		No. of Periods
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
	Reference Books: 1. W. S. Jawadekar, 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		

Course code: GE505.3	B.C.A Part-III (Sem-V) NEP 1.0 E-Commerce	Credits: 4	Marks:100
	Total Hours of Teaching: 60	External:80	Internal :20
Course Outcomes	After completion of this course students will be able to- 1. Understand the various concept of E-Commerce 2. Know the different e-payment systems 3. Analysis E-Security options 4. Examine the different Security Solutions		
Unit No.	Description		No. of Periods
1	Unit-1- Introduction to E-Commerce Concept, Definition, Goals, Components and functions, Advantages and Limitations, Challenges and opportunities, E-Commerce models- C2C, C2B, C2G, B2C, B2B, B2G, EDI- Concept, components, Working mechanism of EDI Advantages and disadvantages of EDI.		15
2	Electronic payment System Concept of e-payment, Difference between traditional and electronics payment system, Digital cash, Credit and Debit card system, Smart Card, Prepaid, post paid and instant payment system, Electronic funds transfer, Concept of e-banking		15
3	E-Security Concept of E-security,Security threats- concept and types , Malicious code, Phishing and identity theft , Hacking and cyber vandalism , Credit card fraud/Theft , Spoofing , Denial of service (DoS) ,Firewall and proxy server		15
4	Security Solutions Concept of encryption and decryption, Symmetric and asymmetric key encryption, Cipher text, Digital Envelopes , Digital certificates, Security socket layer (SSL), Limitations of encryption solutions.		15
	Reference Books 1. E-Commerce- Kenneth C.Laudon and Carol Guercio Traver 2. Internet marketing and E-commerce-Ward Hanson and Kirthi Kalyanam 3. E-Commerce Concepts , Models , Strategies by -- G.S.V Murthy 4. E-Commerce by --Kamlesh K Bajaj and Debjani Nag 5. Electronic Commerce by --Gary P. Schneider 6. E-Commerce A Managers Guide, Ravi Kalkota		

Course code: **SEC SB506**	**B.C.A Part-III (Sem-V) NEP 1.0 Skill Development IV**	**Credit:-2**	**Marks 50**
Marks:100	Total Hours of Teaching: 30	External:	Internal: 50
Course Outcomes	After completion of this course students will be able to - 1. Reflect on the importance of Professional behavior. 2. Articulate and adapt the various facets that make up one's personality.		

UNIT No.	**Description**	**No. of Periods**
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

Reference Books:

1. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.TMH, 1988.
2. Heller, Robert. Effective leadership. Essential Manager series. Dk Publishing, 2002
3. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
4. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill. 2001
5. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
6. Dr.K.K. Ramachandran and Dr.K.K. Karthick, From Campus to Corporate, Macmillan Publishers India Limited, New Delhi,2010.
7. Smith, B . Body Language. Delhi: Rohan Book Company. 2004
8. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
9. Personality Development and Career management: By R.M.Onkar (S Chand Publications)
10. Managing Soft Skills For Personality Development---B.N. Ghosh, McGraw Hill Education

11 Personality Development, Interpersonal Skills and Career Management
Dr. C.S.G., Krishnamacharyulu and Dr. Lalitha Ramakrishnan Himalaya Publishing House Pvt. Ltd.

12. Personality Development –R.C. Bhatia, Ane Books Pvt.Ltd.
13. Soft Skills: An Integrated Approach to Maximise Personality, Gajendra Singh Chauhan, Wiley Publisher.

Nature of Internal Evaluation

Mock Interview	10 Marks
Role Play	10 Marks
Group Discussion	10 Marks
Written Assignment	10 Marks
Listening Activity	10 Marks

Course code: CCL 507	**B.C.A Part-III (Sem-V)** **NEP 1.0** **Lab Course IX based on CC501**	Credit:-2	Marks 50
	Total Hours of Teaching:30	External : 50	
Course Outcomes:	1. Implement the Concept of OOP in Java through simple programs. 2. Implementation and Evaluation of concept related to class and inheritance, concept of Multiprogramming and Exception Handling.		
List of Programs (Note: Students should certify & enclose minimum 10 programs in journal.)			
1	Java programs based on branching and looping statements.		
2	Java programs based Type Casting		
3	Java programs based on command line arguments		
4	Java programs based on constructors		
5	Java programs based on inheritance		
6	Java programs based on method overloading		
7	Java programs based on method overriding		
8	Java programs based on interfaces		
9	Java programs based on packages		
10	Java programs based on multithreading		
11	Java programs based on exception handling		

Course code: CCL 508	**B.C.A Part-III (Sem-V)** **NEP 1.0** **Lab course-X Based on CC504 and CC503**	Credit :02	Marks: 50
Course Outcomes	After completion of this course student should be able to- 1. Design console applications using C#. 2. Design web application using ASP.Net		

Sr. No.	List of Practical's based on CC503
Consol applications	
1.	Write a program to display even no and odd no using C#.
2.	Write a program to demonstrate parameter passing mechanism and out parameter.
3.	Write a program to demonstrate type casting.
4.	Write a program to demonstrate partial class.
	Web Applications
5.	Create web page using server controls- Textbox, List Controls, Calender, Imagebutton, Linkbutton
6.	Develop ASP.Net Application through which user upload Image and that Image should be displayed in Image Control.
7.	Write a program to create a web page showing use of following validation controls a. Required field validator b. Range validator c. Compare validator d. Custom validator e. Regular expression validator f. Validation summary
8.	Write a program to create a web page passing multiple values between asp.net pages
9.	Write a program to create a web page showing use of response, redirect and server transfer
10.	Write a program to create a database for Medical shop system and represent data using Gridview.
11.	Using ADO.NET, create a student database and perform operations like- insert, update and delete records.
12.	Develop ASP.Net application for uploading Image.
13.	Develop a ASP.Net application for recording Registration details using different controls & validators
14.	Create application for displaying different reports.
At least 10 practical's based on CC504	

BCA-III (Sem-VI)

Course Code	Title of Paper	Credit	Internal Marks	External Marks	Total Marks
CC 601	Python	4	20	80	100
CC 602	IT Security	4	20	80	100
DSE 603	Elective-I 1. Internet of Things(IoT) 2. Android Programming 3. R Programming	4	20	80	100
GE 604	Elective-II 1. IT Management 2. Cloud Computing 3. Knowledge Management	4	20	80	100
SEC SB 605	Skill Development	2	50	-	50
CCL 606	Lab Course XI Based on CC 601	2	-	50	50
CCL 607	Lab Course XII Based on DSE 603	2		50	50
CCL 608	Major Project	4	20	80	100
		26	150	500	650

Course Code: CC 601	B.C.A Part-III (Sem-VI) NEP 1.0 Python	Credits: 4	Marks:100
	Total Hours of Teaching: 60	External :80	Internal :20
Course Outcomes	Students of this course will be able to : 1. Acquire programming skills in core Python. 2. Develop Python programs with conditionals and loops. 3. Understand advance datatypes in Python Programming. 4. Develop problem solving skills and their implementation through Python.		
Unit No.	**Description**		**No. of Periods**
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 By Sequence 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-In Dictionary 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

	Reference Books: 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. O Level Programming and Problem Solving Through Python Language: Made Simple :Paper back by Prof. Satish Jain (Author), Shashi Singh	

Course Code: CC 602	B.C.A Part-III (Sem-VI) NEP 1.0 IT Security	Credit:-4	Marks:100
	Total Hours of Teaching: 60	External :80	Internal:20
Course Outcomes	The student will be able to: 1. Understand the concept and need of IT security. 2. Identify different security threats to information systems. 3. Describe security controls used for IS security. 4. Understand provisions in IT Act 2000 and Design Security policy for IT Enabled Organization.		

Unit No.	Description	No. of Periods
1	**Introduction to IT Security** Definition of Information System Security, Basics– Introduction, Need, Significance and Challenges of IT Security, IT Assets - Physical Assets (Servers, Workstations, Peripherals, Smartphones, Networking Devices, Information Technology Equipment, Storage Devices, Supplies, IT Personnel) and Logical Assets (Software, Data and Information). Information security dimensions- confidentiality, integrity and availability.	15
2	**Security Threats** Introduction and types of security threats, sources of threats, Cyber Crimes. Security Attacks- Passive attacks (Network Analysis; eavesdropping; Traffic control), Active attacks (Phishing, Sniffing, spoofing, Denial of service attack), Malicious Code (Virus, Malware, Worm, Trojan horse), Keyboard loggers, Web tracking, Perpetrators (Hackers, Crackers) Other Security Threats- Natural disaster, environmental hazards, Theft, User error, Hardware and Software failure.	15
3	**IT Security Control Measures** Identification, Access Controls/Authentication: Password Protection, Biometric verification, Intrusion detection and prevention system, Multilevel authentication. Antivirus, Recovery software and services, Data backups, Malware detectors, Logs. Cryptography-Types of Cryptography, Digital signature and certificate. Firewall System, Deception Technology, Control Measures for Internet Security.	15
4	**IT Act and Security Standards** IT Act 2000 and features of IT Act, Amendments in IT Act, Cyber-crimes under Information Technology Act 2000, Legal issues and challenges. Cyber security standards. IS Audit and Security Policy.	15

Reference Books:

1. Mark Stamp's Information Security: Principles and Practice (WIND) Paperback – by Deven N. Shah, Wiley.
2. Information Systems Security: Security Management, Metrics, Frameworks and Best Practices by Nina Godbole, Wiley, 2nd edition
3. Michael T. Simpson, Kent Backman, James Corley ―Hands- On Ethical Hacking and Network Defense‖,2016
4. Steven DeFino, Barry Kaufman, Nick Valenteen ―Official Certified Ethical Hacker Review Guide‖,2015
5. William Stallings, ―Principle of Computer Security‖, McGraw Hill Education, Fourth Edition, 2016.
6. AtulKahate, ―Cryptography and Network Security‖, Tata McGraw-Hill, 2003
7. Essential Computer Security: Everyone's Guide to Email, Internet and Wireless security", by Tony Bradley, Syngress Publication 2006
8. "Cryptography & Network Security", by Behrouz A. Ferouzan, Tata McGraw Hill, 2007.
9. Information & Network Security for GTU, I. A. Dhotre V. S. Bagad, Technical

	Publication, Edition 2018 10. Cyber frauds, cyber crimes and law in India by Pavan Duggal. 11. Cyberlaw: The Law of the Internet and Information Technology, Brian Craig. 12. Information System Audit and Control by Ron Weber

Course Code: DSE 603.1	B.C.A Part-III (Sem-VI) NEP 1.0 Internet of Things(IoT)	Credit:-4	Marks 100
	Total Hours of Teaching: 60	External :80	Internal : 20

Course outcomes-

CO1 Understand the fundamentals of Internet of things.

CO2 Identify different components in IoT environment

CO3 Demonstrate Hardware and Software configuration for IoT using Arduino

CO4 Differentiate between different types of IoT applications using Arduino

Unit No.	Description	No. of Periods
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, Pull-up Resistors, Pins Configured as OUTPUT, pinMode() Function, digitalRead() Function, digitalWrite() Function, analogRead() function, analogWrite() function, Arduino time Functions: delay() function, delayMicroseconds() function, millis() function, micros() function. Introduction to RaspberryPi.	15

Reference Books:

1. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things Key applicationsand Protocols", Wiley,2012.
2. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)",1st Edition, VPT,2014
3. CunoPfister, 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 Jepson, Nicholas Robert Weldin, O'Really, 3rd Edition,2020

Course Code: DSE 603.2	B.C.A Part-III (Sem-VI) NEP 1.0 Android Programming	Credit:-4	Marks 100
	Total Hours of Teaching: 60	External :80	Internal : 20

Course Outcomes

CO1: Understand the basics of Android and Android Platform

CO2: Identify different components used in user interface related to Android application development

CO3: Analyze the importance of data persistence in mobile environment

CO4: Illustrate different advanced topic used in Android development

Unit No.	Description	No. of Periods
1.	**Introduction to Android:** Overview of Android, what does Android run on – Android Internals? Android for mobile apps development, Environment setup for Android apps Development, Framework - AndroidSDK, Eclipse, Emulators – What is an Emulator / Android AVD? Android Emulation – Creation and set up, First Android Application	15
2	**Android Activities and GUI Design Concepts:** Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activities, UI -Layouts and Layout properties, UI Design: Time and Date, Images and media, Composite, Alert Dialogs & Toast, Popup, XML Introduction to GUI objects viz.: Push Button, Text / Labels, Edit Text, Toggle Button, Padding	15
3	**Data Storage and Persistence:** Using SQLite database in Android, File I/O and Shared Preferences, Content Providers and Data Sharing, Data-binding and MVVM architecture	15
4	**Advanced Topics in Android Development** Security in Android applications, Advanced UI/UX design principles, Location-based services, Android app testing and debugging techniques	15

Reference Books:

1. Building Android Apps in Easy Steps, 1st Edition, McGraw-Hill Education
2. "Android Programming: The Big Nerd Ranch Guide" by Bill Phillips and Chris Stewart
3. Teach Yourself Android Application Development In 24 Hours, Edition:I, Publication: SAMS
4. Neil Smyth, 'Android Studio Development Essentials', 6th edition by Neil Smyth
5. Reto Meier, 'Professional Android to Application Development',2nd edition, Wiley India Pvt Ltd

Useful Links:

1. http://www.tutorialspoint.com/android/ developer.android.com/training/basics/firstapp
2. http://pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf
3. Android Developer Documentation - Data Storage (developer.android.com/guide/topics/data)
4. Android Developer Documentation - Advanced Topics (developer.android.com/guide)

Course Code: DSE 603.3	B.C.A Part-III (Sem-VI) NEP 1.0 R Programming	Credit:-4	Marks 100
	Total Hours of Teaching: 60	**External :80**	**Internal : 20**

Course Outcomes:	At the end of this course, student will be able to: 1. Understand the fundamental syntax of R through practice exercises. 2. Describe the control statements and functions in R. 3. Analyze a data set in R and represent findings using the appropriate R packages. 4. Use data visualization tools.	
Unit No.	**Description**	**No. of Periods**
1	**Introduction to R:** Introduction, History of R Programming, Installation of R & R Studio, Real-world uses of R, 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:** Matrices- Creating matrices, accessing elements of a Matrix, Operations on Matrices, Matrix transpose, Arrays – Creating arrays, adding elements of array, removing elements of array dimensions, indexing arrays, Data Frames – Creating Data Frames, Indexing Data Frames, Basic Data Frame Manipulation	15
4	**Introduction to Data Visualization:** Introduction , Advantages and disadvantages 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
	Reference Books: 1. R Programming for Data Science Peng, R.D. (2020) Book down: New York. 2. An Introduction to Statistical Learning by Gareth James (2017) Publisher: Springer 3. R for Data Science by Garrett Grolemund 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.	

Course Code: GE 604.1	B.C.A Part-III (Sem-VI) NEP 1.0 IT Management	Credit:-4	Marks 100
	Total Hours of Teaching: 60	External : 80	Internal : 20

Course Outcomes:	After completion of course student will be able to: 1) Understand IT assets and describe functions of IT Department 2) Identify IT infrastructure components. 3) Describe network infrastructure components and security management activities. 4) Demonstrate best practices and operational processes in Data Centre Management.	
Unit No.	**Description**	**No. of Periods**
1	**Information Technology Assets and IT Department Organization** Introduction to IT, Components of IT, IT Assets, Types of IT Assets,Need and Significance of IT Asset Management. Organization of IT Department – set up, roles & responsibilities,Interfacing with other functional departments, Functions of IT Management Department. IT Professionals- characteristics of successful IT Professionals Recruitment, Background checking, segregation ofduties, compulsory vacation etc.	15
2	**IT Infrastructure Management** Introduction to IT Infrastructure, Infrastructure Components (Hardware, Software, Network), Need and significance of Infrastructure Management, Hardware infrastructure management: Selecting, installing, deploying, maintaining, and configuring all the hardware in the infrastructure. Software Infrastructure Management: Selecting, installing, deploying, maintaining, and configuring all the software's in the infrastructure. Software Licensing issues, Licensing options	15
3	**Network Infrastructure and Security Management:** Network infrastructure Components, Selecting, installing, deploying, maintaining, and configuring all the network components in the infrastructure Need and significance of Security Management, IS security planning, Security program, Risk management and control , Formation of SOC, Organization of Responsibilities of SOC.	15
4	**Data Centre Management:** Introduction to Data Centre, Need and significance to Data centre,Types of Data Centre (Tier I, Tier II, Tier III, Tier IV), Regulations, best practices and operational processes, Introduction to virtualization.	15
	Reference Books: 1. Information Technology for Management: henry C. Lucas Jr. Tata McHill 2. Information Technology Planning – Lori A.Goetsch - Jaiko Books 3. Planning & Financial Management of IT–Frank Bakhister–British Library catalogue in Publish of Data 4. Information Technology for Management – John Wiley & SMS (ASIA) PAC Lts. Singapore	

	5. Management of Technology – Zafar Husain Sushil, R D Patnaik, ANMOL Publication Pvt.Ltd., New Delhi -110002 6. Data Centre Handbook by Hwaiyu Geng PE 7.Data Centre Management: Your Guide to Efficient Data Centre Operation	

Course Code GE604.2	B.C.A Part-III (Sem-VI) NEP 1.0 Cloud Computing	Credit: 4	Marks: 100
	Total hours of teaching: 60	External: 80	Internal: 20

Course Outcomes (COs) : On completion of the course, the students will be able to

C01	Understand the fundamental principles of Cloud Computing.
C02	Understand the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing.
C03	Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
C04	Describe cloud computing applications

Unit No.	Description	No. of Periods
1	**Introduction to Cloud Computing** • Introduction • Roots of Cloud Computing • Layers and Types of Cloud • Desired Features of a Cloud • Platform as a Service Providers • Architecture of cloud computing • Challenges in the cloud • Types of Cloud : Private, Public, Hybrid	15
2	**Virtualization** • Introducing virtualization and its benefits • Implementation Levels of Virtualization • Virtualization at the OS Model • Virtualization Structure: Hosted Structure, Bare-Metal • Structure Virtualization of CPU, Memory, and I/O Devices • Virtualization in Multicore Processors • Virtual Clusters and Resource management	15
3	**Cloud Computing Services** • Infrastructure as a Service • Platform as a service • Leveraging PaaS for productivity • Guidelines for selecting PaasPovider • Concern with PaaS • Language and PaaS • Software as a Servive • Database as a Service • Specialized Cloud Services	15
4	**Cloud Computing Applications** • Business Applications: MailChimp, Salesforce, Chatter, Paypal • Education Applications: Google Apps for Education, Chromebooks for Education,	15

	Tablets with Google Play for Education • Entertainment Applications: Online games, Video Conferencing Apps • Social Applications: Facebook, Twitter, LinkedIn	

Books Recommended:

1. Cloud Computing : Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M.Gos cinski, Willey Publication
2. Cloud Computing : Black Book, KailashJayaswal, JagannathKallakurchi, Donald J. Houde, Dr. Deven Shah
3. Cloud Computing : Bible, Barrie Sosinsky, Willey Publication
4. Cloud Computing : A Hands-On Approach, ArshdeepBahga, Vijay Madisetti
5. Distributed & Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack Elsevierm, 2012

Course Code: GE604.3	B.C.A Part-III (Sem-VI) NEP 1.0 Knowledge Management	Credits: 04	Marks : 100
	Total Hours of Teaching: 60	External :80	Internal : 20
Course Outcomes	After completion of this course students will be able to - 1. Explain the fundamentals of knowledge management 2. Understand of the Knowledge Management life cycle. 3. Categorize the Knowledge Management tools. 4. Implement Knowledge Management in different sectors.		
Unit No.	**Description**		**No. of Periods**
1	**Introduction to Knowledge Management (KM):** • History of Knowledge Management, • Definition, scope and significance of Knowledge Management • Basic Types of Knowledge, • Knowledge Management Processes • Knowledge Management Systems • Data-Information-knowledge-Wisdom relationship • Organizational impact on knowledge management • Factors influencing Knowledge Management.		15
2	**Knowledge Management Life Cycle** • Introduction & phases of Knowledge management life cycle • Principles of Knowledge Management • Techniques of Knowledge Management • Knowledge Application Systems • Knowledge Capture Systems • Knowledge sharing systems • Knowledge Discovery Systems		15
3	**Knowledge Management Techniques and Tools** • Organizational knowledge creation- Knowledge network, knowledge mapping tools- visual thinking software, concept map, • Knowledge Acquisition tools- e-mail, newsgroup, web-conferencing, IRC • Organizational knowledge processing • Knowledge analysis- data mining, on-line data analytical processing		15
4	**Knowledge Management and Industry perspective:** • Role of Information Technology in Knowledge Management Systems • Knowledge Management and E-commerce • Bench marking and Knowledge Management • Knowledge Management in Manufacturing and service industry, • KM roles and Responsibilities within organizations, • Future of Knowledge Management. • Future challenges for KM. • Careers in Knowledge Management		15

	Reference Books- 1. Knowledge Management, Sudhir Warier, Vikas Publishing House. 2. Web Warehousing & Knowledge Management, Mattison: Tata McGraw-Hill.Knowledge management: An Evolutionary view, Becerra Fernandez: PHI. Knowledge Management, Fernando: Pearson. 3. Knowledge Management, B. Rathan Reddy: Himalaya.Knowledge Management, Tapan K Panda: Excel. 4. Knowledge Management systems, Barnes: Cengage. 5. The Knowledge Management tool kit, Tiwana: 2/e, Pearson Education. 6. Knowledge Management, Sislop: Oxford University Press,. 7. nowledge Management, Debowski: Wiley Student Edition, Wiley Ind 8. Knowledge management, A Thothathri Raman, Excel books	

	B.C.A. Part-III Semester VI **NEP 1.0**	
SEC SB 605	**Soft Skills & Personality Development** **(Choice Based Credit System)**	
Course Outcomes	**Students of this course will be able to :** 1. Comprehending the Value of a Professional Mindset 2. Enunciating and Adapting the Myriad Facets of One's Personality	
Marks: 50	Total Hours of Teaching: 30 | University Exam: 00 | Internals: 50	
Syllabus Content:	Credits: 2	
Unit 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: Communication Skills, Critical Thinking and Creative Problem Solving Skills, Conflict Management, Collaborative Team Work, Working on Attitude-aggressive, assertive and submissive, Leadership skill, Time Management; Stress Management, Resilience	**15 Periods**
Unit 2	**Personality Development:** Introduction and Importance; Discovering Oneself, SWOT Analysis; Building Self- Esteem & Self-Confidence, Developing Interpersonal Relationships- ways to build Strong Inter Relationships; Work ethics –Good Manners and Etiquette- 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; Resume Building; Facing The Personal Interview,	**15 Periods**
	Reference Books: 1. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw-Hill 1988. 2. Heller, Robert. Effective leadership. Essential Manager series. Dk Publishing, 2002 3. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003 4. Lucas, Stephen. Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill. 2001 5. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004). 6 Dr.K.K. Ramachandran and Dr.K.K. Karthick, From Campus to Corporate, Macmillan Publishers India Limited, New Delhi,2010. 7. Smith, B . Body Language. Delhi: Rohan Book Company. 2004 8. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi. 9. Personality Development and Career management: By R.M.Onkar (S Chand Publications) 10. Managing Soft Skills For Personality Development---B.N. Ghosh---- McGraw Hill Education 11.Personality Development, Interpersonal Skills and Career Management---Dr. C.S.G. Krishnamacharyulu and Dr. Lalitha Ramakrishnan ---- Himalaya Publishing House Pvt.Ltd. 12.Personality Development –R.C. Bhatia--- Ane Books Pvt.Ltd. 13.Soft Skills: An Integrated Approach to Maximise Personality ---Gajendra Singh Chauhan---Wiley Publisher.	

	Nature of Internal Evaluation Mock Interview 10 Marks Role Play 10 Marks Group Discussion 10 Marks Written Assignment 10 Marks Listening Activity 10 Marks	

CCL 606	B.C.A Part-III (Sem-VI) NEP 1.0 Lab Course-XI Based on CC 601	Credit:-2
		External : 50 Marks
Course Outcomes	After completion of this course student should be able to- 1. Demonstrate and use different Datatypes in Python. 2. Apply various built looping statements and Modules provided by Python.	
1.	Program to display name and address.	
2.	Program to Accept two number and display addition, subtraction, multiplication,division and modules.	
3.	Program to calculate factorial of given number.	
4.	Program to create a list of 100 numbers and separate those numbers in two different list one includes odd number other even.	
5.	Program to display maximum number and minimum number from given list	
6.	Program to demonstrate slicing.	
7.	Program to demonstrate set operators (union , intersection, minus)	
8.	Program to print current date and time.	
9.	Program to Today's Year, Month, and Date	
10.	Program to convert Date to String	
11.	Program to display the Calendar of a given month.	
12.	Program to display calendar of the given year.	
13.	Program to demonstrate File input.	
14.	Program to demonstrate file output	
15.	Program two add two numbers using GUI.	

Note: Students should certify & enclose minimum 10 programs in journal.

CCL 607	B.C.A Part-III (Sem-VI) NEP 1.0 Lab Course XI based on DSE603	Credit: 2
		External : 50 Marks

Course outcomes

CO1: Demonstrate the circuit configuration for IoT applications using Arduino boards.

CO2: Apply the different functions provided in Arduino libraries for execution of IoT applications

1. Program to Turn an LED on and off everysecond.
2. Program to read a switch, print the state out to the Arduino SerialMonitor.
3. Program to demonstrate the use of analog output to fade anLED.
4. Program to Read an analog input and prints the voltage to the SerialMonitor.
5. Program to Blink an LED without using the delay()function.
6. Program for a pushbutton to control anLED.
7. Program for the use of INPUT_PULLUP withpinMode()
8. Program to Count the number of buttonpushes.
9. Program using Analog Input to Read an analog input pin to dim or brighten anLED.
10. Program using Analog Input to control the blinking of an LED withphotoresistor.

Reference

- **https://docs.arduino.cc/built-in-examples/**

Note: Students should certify & enclose 10 programs in journal.

CCL 607	B.C.A Part-III (Sem-VI) NEP 1.0 Lab Course XI based on DSE603	Credit: - 2
		External: 50 Marks

Course outcomes

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

CO2: Apply Android activities to develop mobile applications

1. Development of Hello World Application
2. Create Android application to demonstrate Activity Life Cycle.
3. Create Android application to call different activities by using Implicit and Explicit Intents
4. Create a screen that has input boxes for User Name, Password, Address, Gender (radio buttons for male and female), Age (numeric), Date of Birth (Date Picket), State (Spinner) and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout) Display toast message after click button.
5. Create Android application to design Simple Toast
6. Create Android application to displaying images using Multithreading
7. Developing an android application using Relative layout to display Date and time.
8. Create Android application to demonstrate Alert dialog.
9. Development of Simple Calculator Application in Android
10. Develop application using Audio Functions in Android
11. Develop application using Location Services and Google Maps in Android
12. Create an android application to demonstrate concept of SQLite Database Storage method.

Reference

https://www.tutorialspoint.com/android/index.htm

Note: Students should certify & enclose minimum 10 programs in journal.

CCL 607	B.C.A Part-III (Sem-VI) NEP 1.0 Lab Course XI Based on DSE 603	Credit: -2

External:50 Marks

Course outcomes

CO1: Apply syntax of R through practice exercises.
CO2: Implement the control statements, functions, data visualization. in R.

Practical's:

1. Import a variety of data formats into R.
2. Execute statistical analyses with R.
3. Apply data science concepts and methods using R to solve problems in real-world contexts andwill communicate these solutions effectively.

Basic R Programs:

1. Find the factorial of a number
2. Check whether a number is prime or not
3. Find Sum, Mean and Product of Vector
4. Generate Random Number from Standard Distributions
5. Find Minimum and Maximum
6. Check Armstrong Number
7. Sum of Natural Numbers Using Recursion
8. Print the Fibonacci Sequence
9. Check for Leap Year
10. Check whether number is Odd or Even
11. Check if a Number is Positive, Negative or Zero
12. Find the Sum of Natural Numbers
13. Convert Decimal into Binary using Recursion in R
14. Find the Factorial of a Number Using Recursion
15. R Program to Find H.C.F. or G.C.D.

Data Visualization basic practical's:

Download **mtcars dataset in R**. (also available on GitHub) and create the following graphics:

1. Create a pie chart showing the proportion of cars from the mtcars data set that have different cylinder (cyl) values.
2. Create a bar graph, that shows the number of each carb type in mtcars.

3. Show a stacked bar graph of the number of each gear type and how they are further divided out by cyl

4. Draw a scatter plot showing the relationship between wt and mpg.

Design a visualization of your choice using the data and write a brief summary about why you chose that visualization

Note: Students should certify & enclose minimum 10 programs in journal.

CCL608	B.C.A Part-III (Sem-VI) NEP 1.0 Major Project	Credit-4	Marks-100
		External-80	Internal- 20
Guidelines for Major Project Work :	**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 both side of the paper. (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. **Appendix -** • Input Design • Report Design • Implementation • Testing Standard Project **Standard Project Report Documentation Format** a) Cover Page b) Institute/College certificate c) Guide Certificate d) Student declaration e) Acknowledgement f) Index (Chapter Scheme with page numbers) 1) **Introduction to Project** –		

	Introduction –Working of System -Need and scope of System -Organization Profile 2) **Proposed System** -Objectives –Software Requirement Specifications. 3) **System Diagrams** • DFD • ERD • UML (if applicable) System Requirements • Hardware • Software 4) **System Design** • Database Design • Input Design • Output Design 5) **User Manual** 6) **Input and Outputs screens** and Reports (Fill at least 20 different valid records) 8) **Conclusion and Suggestions** • Conclusion and suggestions • Future enhancement **Bibliography/References:** ***Note : Minimum 5 reports are essential as outputs of the project work done by the student.***