Shri Sangameshwar Education Society's

Sangameshwar College, Solapur [Autonomous]

(Affiliated to Punyashlok Ahilyadevi Holkar Solapur University, Solapur)

Kannada Linguistic Minority Institute

NAAC Accredited with 'A' Grade (III Cycle CGPA 3.39)

Academic Council 5(5.2)
15th June, 2022

STRUCTURE OF BCA PROGRAMME UNDER CBCS PATTERN
Faculty of Science
B.C.A THIRD YEAR
(To be implemented from A.Y. 2022-23)
Table-1

Semester	Course		Teaching Scheme/week		
			Hours	Lectures	Credits
V	AECC-D	English for Communication	3.2	4	2
	DSC-1E	Advanced Java –IX	4.8	6	4
		Practical-IV	4	5	2
	DSC-2E	Visual Programming –X	4.8	6	4
		Practical-IV	4	5	2
	DSC-3E	Advanced Python Programming- - XI	4.8	6	4
		Practical-IV	4	5	2
	ANY ONE FROM DSC-4E(I) & 4E(II)	Data Warehouse and Data Mining – –XII	4.8	6	4
		Web and E-Commerce Technology-XII			
	SEC-3- Computer Graphics		2.4	3	2
	Total		**36.8**	**46**	**26**
VI	AECC-E	English for Communication	3.2	4	2
	DSC-1F	Dot Net Technology-XIII	4.8	6	4
		Practical-V	4	5	2
	DSC-2F	Android Programming-XIV	4.8	6	4
		Practical-V	4	5	2
	DSC-3F	Linux and Shell Programming-XV	4.8	6	4
		Practical-V	4	5	2
	ANY ONE FROM DSC-4F(I) & 4F(II)	Recent Trends in IT- XVI	4.8	6	4
		Mobile Computing- XVI			
	SEC-4- Cryptography and Network Security		2.4	3	2
	Project		4.8	6	4
	Total		**41.6**	**52**	**30**
Total Semester V and VI			**78.4**	**98**	**56**

Table-2

Semester	Course		EXAMINATION Marks			Credits
			CA	SEE	Total	
V	AECC-D	Theory -V	15	35	50	2
	DSC-1E	Advanced Java -IX	30	70	100	4
	DSC-2E	Python Programming -X	30	70	100	4
	DSC-3E	Visual Programming- -XI	30	70	100	4
	DSE-4E	Data Communication and Networking -XII	30	70	100	4
	SEC-3 - Theory Of Computer Science		15	35	50	2
	Total		**150**	**350**	**500**	**20**
VI	AECC-D	Theory-V	15	35	50	2
	DSC-1F	Android Application Development -XIII	30	70	100	4
	DSC-2F	Internet Programming using ASP.Net XIV	30	70	100	4
	DSC-3F	React JS-XV	30	70	100	4
	DSE-4F	System Security - XVI	30	70	100	4
	SEC-4 - Compiler Construction		15	35	50	2
	DSC-1E	Practical-IV	15	35	50	2
	DSC-2E	Practical-IV	15	35	50	2
	DSC-3E	Practical-IV	15	35	50	2
	DSC-1F	Practical-V	15	35	50	2
	DSC-2F	Practical-V	15	35	50	2
	DSC-3F	Practical-V	15	35	50	2
	DSE-4	Project	30	70	100	4
	Total		270	630	900	36
Total Semester V and VI			**420**	**980**	**1400**	**56**

Program Learning Outcomes of BCA (POs):

1) Analyze and apply advanced technologies to solve real world problems in aspects of computer application.

2) Apply the standard software engineering practices and strategies in software project development using the open source programming environment to deliver a quality product for business success.

3) Design solutions to complex engineering problems.

4) Apply ethical principles in project management.

5) Learn teamwork while project development.

6) Recognize the need for learning in the context of technological change.

Program Objectives

- To create a sound academic base from which on advanced career in computer application can be developed
- To train the students in Computer Skills

- Clarity on both conceptual and application-oriented skills in IT Applications.

Teaching Learning Methodology

The learning methodologies includes

1. **Internal Exposure**
   Lectures, Assignments, Certified Courses, EDP, Project work and Practical on Application of Software Development
2. **External Exposure**
   Seminars, Industrial Visits, Development Programs

DETAILED SYLLABUS
Of
COURSES OFFERED BY THE PROGRAMME

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15ᵗʰ June, 2022

Course Title: Advanced Java -IX (2241501)

Course Code: DSE-1E   **Total Hours 60**   **Course Credits 4**

Course Objectives:

To provide the ability to design console based, GUI based and web-based applications. Students will   also be able to understand integrated development, environment to create, debug and run multi-tier and enterprise-level applications

Unit No	Content	Hrs.
Unit-I	**Servlet** Introducing CGI and Servlet, Advantages of Servlet over CGI, Features of Servlet,Introducing Servlet API -Javax.servlet package ,Javax.servlet.http package , Servletlife Cycle , Working with GenericServlet and HttpServlet ,RequestDispatcher interface , Include() and forward() , Use of RequestDispatcher ,Session in Servlet, Cookies- Advantages & disadvantages of cookies, use of cookies, Hidden form filed -Advantages & disadvantages, use of Hidden form filed, URL rewritten –advantages, disadvantages, use of URL rewritten Introducing session -HttpSession , Advantages & disadvantages	10
Unit-II	**JSP** Introduction to JSP, Advantages of JSP over Servlet, JSP architecture, JSP life cycle, Implicit objects in JSP- request, response, out, page, page Context,application, session, config, exception , JSP tag elements Declarative,Declaration, scriplet, expression, action, Java Bean- Advantages & Disadvantages, Use Bean tag- setProperty and getProperty, Bean In jsp, internationalization & Java: local class, ResourceBundle class	10
Unit-III	**JSP Standard Tag Library** JSTL core tag: General purpose tag, conditional tag, networking tag, JSTL SQL tags, JSTL formatting tags, JSTL xml tags, Custom tag: empty tag, body content tag, iteration tag.	10
Unit-IV	**Hibernate** Introduction Hibernate (HB), Architecture of HB, Application of HB: HB with annotation, HB web application **Inheritance mapping**: Table per Hierarchy using annotation, Table Per Concrete using annotation, Table Per Subclass (TPS) using annotation. Collection mapping: Mapping list, one to many by list, one to many by bag, one to many by set, one to many by map.	10
Unit-V	**Spring** Introduction to spring, Spring modules, Spring application, Dependency injection: constructor Injection (CI), CI dependent object, CI with collection, CI with map, CI inheriting bean.	10

Unit-VI	**Spring JDBC** JDBC template, PreparedStatement, ResultsetExactor, RowMapper, NamedParameter, Simple JDBC template.	10

CoNo	**Expected Course Outcomes** *On completion of this course, the students should be able to:*
1	Use java API for web application development
2	Understand Server-side programming
3	Apply concept of internationalization, build web page
4	Implement Hibernate concepts to develop web applications

Suggested Readings:
1. "JDBC, Servlet and JSP Black Book"- Santosh Kumar K.
2. "Java EE Server programming"- Sharanam Shah and Vaishali Shah.
3. "Java Server Programming Black book"
4. "Hibernate"- Sharanam Shah & Vaishali Shah
5. "Spring Persistence with Hibernate"- Paul Tepper Fisher, Brian D Murphy.

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SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

Course Title: Visual Programming -X (2241502)

Course Code: DSC-2E   **Total Hours 60**   **Course Credits 4**

Course Objectives:

The course content enables students to implement the basic structure and essential elements of a typical desktop application. Create classes, define and implement interfaces, and create and use generic collections. Use inheritance to create a class hierarchy, extend a .NET Framework class, and create generic classes and methods.

Unit No	Content	Hrs.
Unit –I	**Object oriented concepts** Working with Indexer and Properties, Constructor &Destructor, Working with "static" Members, Inheritance & Polymorphism, Types of Inheritance, Constructor in Inheritance, Interface Implementation, Operator and method Overloading and overriding, Static and Dynamic Binding and Virtual Methods, Abstract Class, sealed keyword. **Delegates: Introduction** of Delegation, Types of delegate, Anonymous Methods	10
Unit-II	**Introduction to C#** C# Language elements,Data types -Reference Type and Value Type, Boxing and Unboxing, Enum and Constant, Operators, Control Statements, Working with Arrays and Strings, Parameter passing technique: Pass by value and by reference, out parameters, Variable length parameter	10
Unit-III	**USING I/O Class** Streams Class, Text Stream and Binary Stream, System.IO and Base classes of Stream, Console I/O Streams, Working with File System - File ,FileInfo, Directory ,DirectoryInfo classes. **Exception Handling** Exception classes and its important properties, Understanding &using try, catch keywords, Throwing exceptions, Importance of finally block	10
Unit-IV	**Windows Forms** Controls: Common control Group, Data control Group, Dialog control Group, Container control Group Menus and Context Menus: Menu Strip, Toolbar Strip, SDI and MDI Applications	10
Unit-V	**Data Access using ADO.NET** Evolution of ADO.NET, Connected and Disconnect Classes, Establishing Connection with Database, Executing simple Insert, Update and Delete, Statements, DataReader and DataAdapter, Dataset, Advantages of DataSet, Stored Procedures	10
Unit-VI	**Collections & Generics** Collection classes: ArrayList, Hashtable, stack, queue, Writing custom generic classes, Working with Generic Collection Classes	10

Co.No	Expected Course Outcomes
	On completion of this course, the students will be able to:

1	Design a complete program using visual programming concept.
2	Develop GUI based application.
3	Understand Object Oriented Concepts and database connection in C#.
4	Design a complete program using visual programming concept.
5	Develop GUI based application.

Suggested Readings:
1. "UnlishedAsp.Net "- Walther , SAMS Pearson.
2. "Professional ASP.Net"-Evjen, Sivkumar, Wrox Press.
3. "The Complete Reference: Asp.Net"-MacDonald, Tata McGraw Hill.
4. "The Complete Reference: Ajex"- Powell, Tata McGraw Hill.
5. " Pro Asp.Net in C#"-MacDonald, Szpuszta-APress
6. " Asp.Net Step by step"- George Shephera-Microsoft Press
7. "Professional Ajex"-Zakas, NxPeak, fawcett, Wrox Press
8. Complete reference crystal reports-Geogre Peak
7.

SANGAMESHWAR COLLEGE, SOLAPUR
(AUTONOMOUS)

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V)   (W.E.F. JUNE 2022)

Course Title: Advanced Python Programming -XI (2241503)

Course Code: DSC-3E   **Total Hours 60**   **Course Credits 4**

Course Objectives:

The course content enables students to develop the skills of designing graphical user interface using   the Tkinter module, also develop socket programming skills, acquire knowledge of Django frame work to develop the ability to access xml file using python programming.

Unit No	Content	Hrs.
Unit-I	**GUI :** Windows Applications using Tkinter GUI Programming GUI in Python, Advantages of GUI, Introduction to GUI library, Basic Operations using Tkinter, Root Window.	10
Unit-II	**Working with Containers: Frame**, Canvas Layout Management, Events and Bindings, Font, Colors, drawing on Canvas (line, oval, rectangle, etc.) Widgets: Label, Button, Check button, Entry, List box, Message, Radio button, Text, Spinbox, Scrollbar, Menu etc. Writing Python Programs for GUI applications	10
Unit-III	**Web Application using Django:** The MVC Design Pattern, Django‟s History, Advantages of Django, Understanding Django environment, Installing Django, Setting Up a Database Django architecture, The Development Server, Django Commands Overview, Starting a Project, Django apps, Difference between app and project, The Project Structure, Setting Up Your Project, Create an Application Migration, Admin Panel. Views in Django, URL Routing, Template in Django, Models in Django, Forms in Django.	10
Unit-IV	**XML**: Introduction to XML, XML Parser Architecture and API‟s, Parsing XML with SAX API‟s, Parsing XML with DOM API‟s	8
Unit-V	**Network Programming: -**Introduction to Sockets Programming, Server Socket Methods, Client Socket Methods, IP Address, URL, TCP/IP Server, TCP/IP Client, Sending E-mail Application	10
Unit-VI	**NumPy: Introduction**, Installation of NumPy, Import NumPy, NumPy Creating Arrays, NumPy Data Types, NumPy Array Copy vs View, introduction to Random Numbers in NumPy, NumPy ufuncs **Pandas:** Introduction, Pandas series, pandas advantage over Numpy, Pandas example finding Max, Pandas Apply function, Pandas Reading a CSV file.	12

CO No	Expected Course Outcomes
	On completion of this course, the students will be able to:
1	Understand working of all the containers of python.

2	Able to apply the Concept of Django framework to develop web application
3	Understand the NumPy and pandas library.

Suggested Readings:
1. Beginning Django: Web Application Development and
Deployment with Python-Daniel RubioApress
2. Django Unleashed- Andrew Pinkham-SAMS
3. Practical Django Projects- James Bennett-Apress
4. Python GUI Programming with Tkinter- Alan D. Moore-Packt
5. Tkinter GUI Application Development H TSHOT - Bhaskar
Chaudhary –Packt
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SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

Optional
Course Title: Data Warehouse and Data Mining -XII (2241504)

Course Code: DSC-4E   **Total Hours 60**   **Course Credits 4**
Course Objectives:

This course will introduce the concepts of Data Warehouse and Data Mining, architecture, applications, methodologies used to extract knowledge from data repository for data analysis and frequent pattern. Algorithms for classification, clustering, and Association rule analysis

Unit No	Content	Hrs.
Unit-I	**Introduction to Data Warehouse** Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction – Transformation – Loading, Logical (Multi – Dimensional), Data Modelling - Schema Design, Star and Snow – Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi – Addictive, Non Addictive Measures; Fact – Less – Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture – ROLAP, MOLAP and HOLAP.	10
Unit-II	**Introduction to Data Mining** What is Data Mining, Difference between Database Management System, Data Warehouse and Data Mining, KDD, Challenges, Data Mining Tasks, Need for Pre-processing the Data Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Data Transformation.	10
Unit-III	**Association Rule** problems Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP- Growth Algorithms, Compact Representation of Frequent Item set- Maximal Frequent Item Set, Closed Frequent Item Sets.	10
Unit-IV	**Classification** Problem Definition, General Approaches to solving a classification problem, Evaluation of classifiers, Classification Techniques, Decision Tree – Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naive Bayes Classifier, Rule base classification, K – N earnest neighbor classification – Algorithm and Characteristics.	10
Unit-V	**Clustering** Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering -K-Means Algorithm, K-Means Additional issues, PAM Algorithm, Hierarchical Clustering – Agglomerative	10

	Methods and divisive methods. Basic Agglomerative Hierarchical Clustering, Strengths and Weakness, Outlier Detection.	
Unit-VI	**Application and trends in Data Mining** Spatial Data Mining, Text Data Mining, Multimedia Data Mining, Web Data Mining, Application of data mining	10

Co No	Expected Course Outcomes *On completion of this course, the students will be able to:*
1	Identify the key process of data mining and data warehousing and data discovery
2	Identify the appropriate data mining algorithms to solve real world problems.

Suggested Readings:
1. Data Mining – Concepts and Techniques – Jiawei Han, MichelinenKamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.
2. Introduction to Data Mining, Pang – Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Education.
3. Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
4. Data Warehouse Fundamentals, PualrajPonnaiah, Wiley Student Edition.
5. Data Mining, Vikaram Pudi, P Radha Krishna, Oxford University Press
2.

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

<mark>Optional</mark>
Course Title: <mark>Computer Graphics</mark> (2241505)

Course Code:SEC-3   Total Hours 30   Course Credits 2

Course Objectives:

This course introduces basic concepts of computer graphics, it provides different applications of computer graphics and multimedia. And also intended to improve both basic and in-depth knowledge of image synthesis in computer graphics.

Unit No	Content	Hrs.
Unit-I	**Introduction:** Applications of computer graphics, Operations of computer graphics, Graphics software packages. Graphical Input output devices: Graphical input devices, graphical output devices, Plasma panel display, LCD display, Printers and Plotters. Raster scan and random scan.	5
Unit-II	**Introduction to multimedia technology:** Definition of multimedia, components of multimedia, Applications of multimedia, multimedia system architecture, multimedia hardware and software.	5
Unit-III	**Multimedia authoring:** Definition of multimedia authoring, Features of authoring tools, authoring tool classification, object-oriented authoring tools.	5
Unit-IV	**Multimedia images and graphics:** Image data types, image file formats Multimedia **sound, audio and video:** Digitization of sound, Transmission of audio, Video: Types of video signals, analog video and digital video.	5
Unit-V	**Multimedia Digital audio coding:** Definition of digital audio coding, Pulse code modulation, Differential coding, Lossless predictive coding	5
Unit-VI	**Multimedia authoring tools and editing Tools:** Introduction and basics of editing tools. 1. Photoshop: adding copyright and contact info to images, picture in picture effect, fading an image, Monochromatic color effect in photo shop, turning of photo into pencil sketch. 2. Dreamweaver: Download and install Dreamweaver, create a homepage file, create a header, create a CSS file.	5

Co No	Expected Course Outcomes
	On completion of this course, the students should be able to:
1	Understand usage of graphical input and output devices
2	Understand the multimedia authoring tools and editing tools

Suggested Readings:

1. Computer Graphics, Multimedia and Animation by Malay K Pakhira
2. Computer Graphics, Donald Hearn, M. Pauline Baker, Prentice-Hall
3. Computer Graphics, Roy A. Plastock, Gordon Kalley, Schaum‚s Outlines, McGraw Hill

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SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – VI)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

Course Title: Dot Net Technology -XIII (2241602)

Course Code: DSC-1F   **Total Hours 60**   **Course Credits 4**

Course Objectives:

The course content enables students to build dynamic Web sites using the ASP.Net programming environment. Gain hands-on experience of building a database-driven Web site.

Unit No	Content	Hrs.
Unit-I	**Introduction of Asp.Net** Understanding architecture ASP.NET, Compilation Technique of ASP.Net, Web Page and Web Site life cycle, ASP.Net Page Structure, Page Directives, Self-page and Cross page posting, Post back and View State concepts, Application Folders	10
Unit-II	**Web Server Control: Creating** ASP.NET Pages – Web Forms, working with web controls – Standard, Control group, Rich Controls, Different type of List control, File Upload, AdRotator, MultiView, Calendar, Create Web User Control **Validation controls: Introduction** of validation, Types of validation, Validation Controls, Validation Groups	10
Unit-III	**Master Pages & Themes** Creating Master and Content pages, programmatically assign master pages, Nested Master pages, Basic Themes and Skins, Creating and Using Themes, defining multiple skins, programmatically working with themes**.**	10
Unit-IV	**Site Navigation: Site** Navigation technique, Site Map Path, Tree View and Menu Control, Nesting sitemap file, Attach XML file to tree view and menu **State Management: Introduction** of state management technique, **Types** of State Management technique, Client side and server-side State Management	10
Unit-V	**AJAX: What** is AJAX and need for AJAX, Client side and server-side AJAX, Implementing AJAX with JavaScript, Using ASP.NET Ajax Control toolkit, Working with AJAX"s Server-side controls, Script Manager, Script Manger Proxy, Update panel, Update Progress, Timer	10
Unit-VI	**Storing and Retrieving Data with ADO.NET** Accessing Data with ADO.NET, Using Data Sets on Web Forms, Processing Transactions, Working with DML commands.	10

CoNo	Expected Course Outcomes *On completion of this course, the students will be able to:*
1	Understand the Microsoft .NET Framework and ASP.net Page structure
2	Design web application with variety of controls.
3	Use Microsoft ADO.NET to access data in web application.

4	Apply AJAX technology on server-side controls.

Suggested Readings:
1. "UnlishedAsp.Net "- Walther , SAMS Pearson.
2. "Professional ASP.Net"-Evjen, Sivkumar, Wrox Press.
3. "The Complete Reference: Asp.Net"- MacDonald, Tata McGraw Hill.
4. "The Complete Reference: Ajex"- Powell, Tata McGraw Hill.
5." Pro Asp.Net in C#"-MacDonald, Szpuszta-APress
6." Asp.Net Step by step"- George Shephera-Microsoft Press
7. "Professional Ajex"-Zakas, NxPeak, fawcett, WroxPress
8. complete reference crystal reports-Geogre Peak
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SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – VI)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15ᵗʰ June, 2022

Course Title: Android Programming – XIV (2241603)

Course Code: DSC-2F   **Total Hours 60**   **Course Credits 4**

Course Objectives:

Android programming course is designed to quickly get you up to speed with writing apps for Android devices. The student will learn the basics of Android platform and get to understand the application lifecycle.

Unit No	Content	Hrs.
Unit-I	**Introduction to Android** Overview. History, Features of Android, Architecture of Android Overview of Stack, Linux Kernel, Native Libraries, Android Runtime, Application Framework, Applications, SDK Overview, Platforms, Tools – (JDK, SDK, Eclipse/Android Studio, ADT, AVD, Android Emulator), Versions, Creating your first Android Application.	10
Unit-II	**Activities, Fragments and Intents** Introduction to Activities, Activity Lifecycle, Introduction to Intents, Linking Activities using Intents, calling built-in applications using Intents, Introduction to Fragments, Adding Fragments Dynamically, Lifecycle of Fragment, Toast.	10
Unit-III	**Android User Interface** Understanding the components of a screen, Views and View Groups, Linear Layout, Absolute Layout, Table Layout, Relative Layout, Frame Layout, Scroll Layout, Scroll View, Constraint Layout, Adapting to Display Orientation.	10
Unit-IV	**Designing Your User Interface with Views** TextView, Button, ImageButton, EditText, CheckBox, Switch, ToggleButton, RadioButton, and RadioGroup , ProgressBar View ,AutoCompleteTextView View ,Using List Views to Display Long Lists ,Using the Spinner View ,Displaying Pictures	10
Unit-V	**Databases** Introduction to SQLite, SQLite Open Helper and SQLite Database, Creating, opening, and closing database, working with cursors, Insert, Update, Delete, Building and executing queries	10
Unit-VI	**Sending SMS and Email** Sending SMS Messages Programmatically, Getting Feedback after Sending a Message, Sending SMS Messages Using Intent, Receiving SMS Messages, Caveats and Warnings, Sending E-mail	10

C o N o	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Describe the process of the developing mobile applications.
2	Create mobile application on the Android Platform
3	Design and implement mobile applications using SQLite database.

Suggested Readings:
1.Beginning Android 4 Application Development, byWei-Meng Lee WILEY india Edition,Wrox
2.Professional Android 4 Application Development by Reto Meier Wrox
3.Head First Android Development: A Brain-Friendly Guide,by David Griffiths and Dawns Griffith
1.

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – VI)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15ᵗʰ June, 2022

Course Title: Linux and Shell Programming – XV (2241604)

Course Code: DSE-3F   **Total Hours 60**   **Course Credits 4**
Course Objectives:
This course will introduce the basic file system and file attributes of Linux, different linux commands to write shell programs.

Unit No	Content	Hrs.
1	**Introduction to Linux** History, Distributions, Features, Linux Architecture, Kernel, Types of Shells, Difference between Windows and Linux Working environments - KDE, GNOME , Xface4 etc **Installation of Linux** Hardware requirement, Software requirements, Create partitions, Configuration of X system, Start-up configuration	10
2	**Linux File System** File System, Hierarchy of File system, Devices and Drives in Linux, Mounting Devices File System parts- Boot Block, Super Block, Inode Block, Data Block **Users, Groups and Permissions** Create Users ,Create groups, Special groups, Assigning permissions to users and groups	10
3	**Commands, Utilities and File Management** Managing file and directories: mkdir, cd and pwd, ls, cat, more, less. Nested directories, File and Directory Operations: find, cp, mv, rm, ln etc. Filters: head, tail , pr, cut, paste , sort, uniq, grep, egrep, fgrep. Text Editors- vi, vim File and Directory permissions- chmod, chown, chgrp. Printing the files - lpr, lpq, lprm etc. Archive and File compression, Windows integration tools.	10
4	**Shell Programming and Process Management** Shell Variables, Shell Scripts – Control and Loop structure, User defined commands, I/O and Redirection, Piping, Metacharacters Process Management : Shell process, Parent and children, Process status, System process, Multiple jobs in background and foreground, Changing process priority with nice. listing processes, ps, kill, Premature termination of process.	10
5	**Disk management and System Administration** Boot Loaders-GRUB, LILO, Custom Loaders System administration – Common administrative tasks, Identifying administrative files, Configuration and log files, Chkconfig, Role of system administrator, Security Enhanced Linux. Configuration Apache and MySql, X Window, Communication	10

6	**Linux Networking**	10
	Networking services and Configuration files, starting services, Network tools-ping, finger, traceroute, who, host, rlogin, slogin, rcp, rsh, ssh. Protocols and Services- SMB, FTP, DHCP, LDAP, NFS and NIS.	

C o N o	**Expected Course Outcomes** *On completion of this course, the students should be able to:*
1	Understand the basic Linux commands of Linux operating system and can write shell scripts.
2	Create file system, directories and operate them.
3	Create file system, directories and operate them

Suggested Readings:
1) Operating Systems by William Stallings(PHI)
2) Operating System by Achyut Godbole (TMH)
3) Linux the complete refrence by Richard Mathews(TMH)
4) Red Hat Linux :The Complete Reference by Peterson (TMH)
5) Unix Systems V 4 Concepts & Applications by Sumitabha Das
6) Using Linux by Bill Ball

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – VI)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

Optional
Course Title: Theory Title: Recent Trends in IT -XVI (2241605)

Course Code: DSC-4F   **Total Hours 60**   **Course Credits 4**
Course Objectives:

This course will introduce the concepts and architecture of recent trends in IT such as Bigdata, Hadoop, Cloud computing, IOT. Different techniques of machine learning, virtualization and its type.

Unit No	Content	Hrs.
1	**GREEN IT INTRODUCTION** Environmental Impacts of IT, Holistic Approach to Greening IT, Green IT Standards and Eco-Labelling, Enterprise Green IT Strategy , Green IT: Burden or Opportunity? **Hardware:** Life Cycle of a Device or Hardware, Reuse, Recycle and Dispose. **Software:** Introduction, Energy-Saving Software Techniques, Evaluating and Measuring Software Impact to Platform Power.	06
2	**BIG DATA AND HADOOP** 1: Introduction to Big Data Topics - What is Big Data and where it is produced? Rise of Big Data, Compare Hadoop vs traditional systems, Limitations and Solutions of existing Data Analytics Architecture, Attributes of Big Data, Types of data, other technologies vs Big Data. 2.Hadoop Architecture and HDFS Topics - What is Hadoop? Hadoop History, Distributing Processing System, Core Components of Hadoop, HDFS Architecture, Hadoop Master – Slave Architecture, Daemon types - Learn Name node, Data node, Secondary Name node.	08
3	**Access Control :** Access Control Principles, Subjects, Objects, and Access Rights, Discretionary Access Control, Example: UNIX File Access Control, Role - Based Access Control	12
4	**Database Security :** The Need for Database Security, security issues in Database Management Systems & Relational Databases, Database Access Control, Inference, Statistical Databases, Database Encryption, Cloud Security.	12

| 5 | **Malicious Software :** Types of Malicious Software (Malware), Propagation– Infected Content– Viruses,Propagation–Vulnerability Exploit–Worms, Propagation–Social Engineering–SPAM Email,Trojans, Payload–System Corruption, Payload–Attack Agent–Zombie, Bots, Payload–Information Theft– Keyloggers, Phishing, Spyware, Payload–Stealthing– Backdoors,Rootkits,,Counter measures | 10 |
| 6 | **Denial-of-Service Attacks :** Denial-of-Service Attacks,Flooding Attacks, Distributed Denial-of-Service Attacks,Application-Based Bandwidth Attacks,Reflector and Amplifier Attacks,Defenses Against Denial-of-Service Attacks, Responding to aDenial-of-ServiceAttack. | 12 |

C o N o	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Develop an understanding of information assurance as practiced in computer operating systems,distributed systems,networks and representative applications.
2	Gain familiarity with prevalent network and distributed system attacks,defenses again stthem, and forensics to investigate the aftermath.
3	Develop Basic Understanding Of Cryptography,how it has evolved,and some key encryption techniques used today.
4	Develop An Understanding Of Security Policies(such as authentication,integrity and confidentiality)
5	implement such policies in the form of message exchanges.

Suggested Readings:

1. M.Stamp,"InformationSecurity:PrinciplesandPractice,"2stEdition,Wiley,ISBN:0470626399, 2011.
2. M. E. Whitman and H. J. Mattord, "Principles of Information Security," 4 stEdition,Course Technology,ISBN: 1111138214, 2011.
3. M. Bishop, "Computer Security:Art and Science," Addison Wesley, ISBN: 0 -201-44099-7, 2002.
4. G.McGraw, "Software Security:Building Security In," Addison Wesley,ISBN:0321356705, 2006.

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – VI)   (W.E.F. JUNE 2022)

Academic Council 5(5.2)
15ᵗʰ June, 2022

Course Title: Cryptography and Network Security (11)

Course Code: SEC-4   **Total Hours 30**   **Course Credits 2**

Course Objectives:

This course will introduce various encryption techniques , the concept of Public key cryptography, study about message authentication and hash functions and knowledge of Network security

Unit No	Content	Hrs.
1	**Security Concepts** Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks – Active and Passive, Security services, Security Mechanisms, A model for Network Security	5
2	**Cryptography Concepts and Techniques** Introduction, plain text and ciphertext, substitution techniques, transposition techniques, encryption and decryption,symmetric and asymmetric key cryptography, steganography, key range and key size,possible types of attacks	5
3	**Symmetric Key Cryptographic Algorithms** Algorithm Types and Modes, An overviewof Symmetric Key Cryptography, DES, International Data Encryption Algorithm(IDEA), RC5, Blowfish, AES	5
4	**Asymmetric Key Cryptography** Brief History of Asymmetric Key Cryptography, An overview of Asymmetric Key Cryptography, The RSA Algorithm, Symmetric and Asymmetric Key Cryptography Together, applications of Cryptography. .	5
5	**Digital Signatures** Introduction, Message digests, MD5, SHA-512,MAC, HMAC, Knapsack Algorithm, Elliptic curve Technology, ELGamal Algorithm. Internet Security Protocols: Secure Socket Layer/TLS, Secure Electronic Transaction, SSL versus SET, E-mail Security PGP, S/MIME.	5
6	**User Authentication and Kerberos** Authentication basics, Passwords, use of smart cards, Biometrics, Kerberos. Network Security: Firewalls, types of firewalls, IP Security Intrusion: Intruders, Audit Records, Intrusion Detection, honey pots.	5

C o N o	Expected Course Outcomes *On completion of this course, the students should be able to:*
1	Understand the cryptography concepts and techniques.
2	Learn Concept of Digital Signature
3	Understand Network security using firewall, biometric and smart card.

Suggested Readings:
1. Atul Kahate Cryptography and Network Security, Tata McGraw-Hill, 2007
2. Behrouz A. Forouzan, Debdeep Mukhopadhyay: Cryptography and Network Security, 2nd Edition, Special Indian Edition, Tata McGraw-Hill, 2011.
3. Michael E. Whitman and Herbert J. Mattord: Principles of Information Security, 2nd Edition, Thomson, Cengage Delmar Learning India Pvt., 2012.
4. William Stallings: Network Security Essentials: Applications and Standards, 4th Edition, Pearson Education, 2012
5.

SYLLABUS FOR B.C.A THIRD YEAR (SEMESTER – V& VI)(W.E.F. JUNE 2022)

Academic Council 5(5.2)
15th June, 2022

PRACTICAL LIST

Course Title: Advanced Java -IX (2241607)

Sr.No	Practical List
1.	Write a program which demonstrates life cycle of Servlet
2.	Write a program by using GenericServlet
3.	Write a program by using HttpServlet
4.	Write a Servlet program to send request to another page
5.	Write a Servlet program to track the user by using (Cookies, URL-rewriting, Hidden form field & HttpSession)
6	Write Jsp program which will display its life cycle
7	Write a Jsp program by using its implicit objects like request, response, out, page, pageContext, application, session, config, exception
8	Write a Jsp program which will use scriplet, expression and declarative tag.
9	Write a Jsp program which will create bean and calculate simple interest
10	Write a Jsp program to create bean to check account balance (from database)
11	Write a Jsp program to insert data into database
12	Write a Jsp program which will use JSTL core tag, JSTL SQL tags, JSTL formatting tags, JSTL xml tags, Custom tag: empty tag, body content tag, iteration tag, simple tag
13	Write a program to display a message in different languages (use java internationalization)
14	Write a simple Hibernate program.
15	Write a HB with annotation
16	Write a HB web application
17	Write a HB Inheritance mapping: Table per Hierarchy (TPH), TPH using annotation, Table Per Concrete (TPC), TPC using annotation, Table Per Subclass (TPS), TPS using annotation. Collection mapping: Mapping list, one to many by list, one to many by bag, one to many by set, one to many by map.
18	Write simple Spring program.
19	Write a Spring program to show Dependency injection: constructor Injection (CI), CI

dependent object, CI with collection, CI with map, CI inheriting bean

Sr.No	Practical List
1.	Write a program to check entered number is even or odd. AP program to get number and display sum of digits.
2.	Write a program to check whether entered year is leap year or not.
3.	Write a program to display date in various formats.
4.	Write a program to Illustrate the Use of Access Specifiers.
5.	Write a program to create sealed class.
6.	Write a program to perform boxing and unboxing operation.
7.	Write a program to demonstrate multilevel inheritance.
8.	Write a program to demonstrate single level inheritance.
9.	Write a program to demonstrate multilevel inheritance with virtual methods.
10.	Write a program to get lower bound and upper bound of an array.
11.	Write a program to demonstrate jagged array.
12.	Write a program to find Minimum and Maximum of numbers. .
13.	Write a program to search elements of an array
14.	Write a program to copy a section of one array to another.
15.	Write a program to demonstrate abstract properties. .
16.	Write a program to implement delegates and to combine two delegates.
17.	Write a program to implement multicast delegate.
18.	Write a program to demonstrate DivideByZero Exception.
19.	Write a program to demonstrate Multiple exceptions.
20.	Write a program to create a file.
21.	Write a program to Read the Contents of File.
22.	Write a program to Create Directory.
23.	Write a program to implement BinaryReader.

24.	Write a program to Read Line from File until end of file is reached.
25.	Write a program to Design user interface using all windows controls
26	Write a program to demonstrate ADO.NET.
27	Write a program to demonstrate Insert, Update and Delete Statements.
28	Write a program to design MDI application.

Course Title: Advanced Python Programming- -XI (2241608)

Sr.No	Practical List
1.	Write a program to draw line, oval, rectangle, etc. using frame in python.
2	Write a program to accept student roll number, name and class and insert into student table.(use GUI)
3	Write a program to create and update model object in Django
4	Write a program to create Django views.
5	Write a simple network program in python.
6	Write a chat application in python using socket programming
7	Write a program to create an application to send Email.
8	Write a program for Reading and Writing XML Files in Python
9	Write a program to implement Parsing XML with DOM APIs in python.
10	Write a program to implement at least five trigonometric functions in Numpy
11	Write a program to draw line, oval, rectangle, etc. using frame in python. 2. Write a program to accept student roll number, name and class and insert into student table.(use GUI)
12	Write a program to implement mean ,median ,average and var statistical functions in Numpy.
13	Write a program to create and update model object in Django
14	Write a program to create Django views.
15	Write a simple network program in python.
16	Write a chat application in python using socket programming
17	Write a program to create an application to send Email.
18	Write a program for Reading and Writing XML Files in Python
19	Write a program to show use of different data types of Numpy and to create single and multidimensional array using Numpy.
20	Write a program to implement at least five trigonometric functions in Numpy

Sr.No	Practical List
1	Write a JavaScript for Addition, Subtraction, Division, and Multiplication of two numbers.
2	2. Design Webpage for employee registration form using all HTML controls and CSS. 3
3	.Design web page for simple calculator By using class. Command name property. Button event.
4	4. Design web page of online shopping form which used textbox, label, buttons, and all type list controls.
5	5. Design Application for cross page posting.
6	Design This year calendar with all holidays in red color.
7	Design web page for image map by using Both method.
8	Design Advertisement web page.
9	Design web page which uses Multiview & View control. Wizard control. File upload control
10	Design web page for all validation control & validation Groups.
11	Create nested master pages.
12	Design web site which uses all site navigation Control.
13	Design web page which shows list of employees in selected dept.
14	Create XML & it's styles Sheet file. .
15	Create Master Detail Form.
16	Create web page demonstrate insert, update, delete and select record.

17	Create web page demonstrate insert record and find sum of sal using stored procedure
18	Design web page for grid view control and shows 10 events in calendar control.
19	Design web page which demonstrate wizard control

Course Title: Android Programming- XIV(2241609)

Sr.No	Practical List
1	Write a program to Create your simple Android Application.
2	Write a program to pass message from one activity to another activity using intent.
3	Write program to display "welcome" message using Toast in android.
4	Write a program to show use of various layouts in android.
5	Write a program to display all data of the table in the list.
6	Write a program to add customer details in customer table (use controls like EditText, Button and TextView).
7	Write a program to create a spinner in android
8	Write a program to display image on the screen in android
9	Write a program to perform insert, update and delete operations on employee table.
10	Write a program to search operation on employee table.
11	Write a program to perform login application using database.
12	Write a program for sending Messages, Receiving SMS Messages using intent.
13	Write a program to send the email in android.
14	Write a program to Create your simple Android Application.

Course Title: Linux and Shell Programming- XV (2241609)

Sr.No	Practical List
1	Creating a Linux Partition, Creating boot disks for LINUX and Installing LINUX. Login and logout, shutting down the server. (This may be a demonstration experiment, the demo to be given by the teacher.)
2	Basic LINUX commands I: Logging on to LINUX, Creating a user account. File System: ls command with flags, pwd, cd, ls, cat, mkdir, rmdir, chmod Basic LINUX commands II: General Purpose Utilities: more, file, wc, od, cmp, comm, diff, lp, banner, cal, date, who, tty, sty.
3	Basic LINUX commands III: Simple Filters: pr, head, tail, cut, paste, sort, uniq, nl, and kill, commands. Line editing with ex command, Logging out.
4	To study vi editor: Create a file, Enter the text, Edit Text, moving around, Save the file. Customizing ex/vi, exrc file and Exinit, options to vi, splitting a file using split command. (Study all important commands and key combinations)
5	Shell Programming 1.Use the Commands - ls with options, pwd, cd, cat, mkdir, rmdir, chmod, cp, rm, mv, more, file, wc, od,cmp, comm, diff, lp, banner, cal, date, who, tty, sty, pr, head, tail, cut, paste,sort, uniq, nl& kill commands. 2. Use the commands - grep,egrep,fgrep,sed,tr, join 3. Write Shell scripts as Menu driven program 4. First 10 odd numbers & First 10 Even numbers 5. First 10 Fibonacci Numbers
6	Write Shell scripts to Checking Prime No.
7	Write Shell scripts for File Handling
8	Write Shell scripts to Display Armstrong numbers from 1 to 1000.
9	Write Shell scripts to Display perfect numbers upto range.
10	Write Shell scripts to change mode of file.
11	Write Shell scripts to check mode of entered file name.
12	Write a shell script to print following pattern 1 2 3 4 5 6 7 8 9 10
13	Create an archive file & compress the same ,Write a shell script to check whether entered file is directory, ordinary or directory file
14	Write a menu driven shell script.

15	Write a shell script to display first five palindrome numbers
16	Write a shell to print the pyramid
17	Write a shell script to print fibonnaci series upto N numbers
18	Write a shell script to print a string in reverse order.

Course Code: (2241610)

> **Project Work**
> **Course Title: Major Project Work**
> **Instructions:** Team size for major project not exceed than two students.

Chairman
BOS in BCA

CBCS BCA PART III SEMESTER V

AECC- V

ENGLISH FOR COMMUNICATION (2241501)

SEE- 35 + CA- 15 = 50 marks

COURSE CREDITS 03L+01T=04   **COURSE CONTACT HOUR 60**

Course Objectives:
- To make the students comprehend English language in general
- To enhance the quest for knowledge and correct pronunciations
- To strengthen oral and written communication skills with grammar accuracy
- To galvanize soft skills

Course Outcomes:

By the end of the course the students will be able to:
- Use oral and written English effectively and fluently
- Demonstrate their knowledge of correct pronunciations
- Apply English language skills and grammar accuracy in clearing competitive examinations
- Apply their knowledge of Soft Skills to succeed in career as well as in practical life.

Module No and Title:
Module I: Prose
1.   The Gift of the Magi: O' Henry
2. The Homecoming: Rabindranath Tagore
3. The California's Tale: Mark Twain

Module II: Poetry
1.   The Solitary Reaper: William Wordsworth
2.   The Queen's Rival: Sarojini Naidu
3.   Oh! How I faint When I
   of You Do Write (Sonnet No 80) : William Shakespeare
4. The Road Not Taken: Robert Frost

Module. III: Pronunciation Skills
1) Basic Sounds in English
2) IPA Symbols
3) Phonetic Transcription
4) Stress and Intonation

Module. IV: Soft Skills
1. Types of 21st Century Skills
2. Learning Skills (4Cs)
3. Preparation for Employment

Reference Books:

BA/BSC Part III Compulsory English Literary Mindscapes-I PAH Solapur University, Solapur (With 20% new additions & changes)

CBCS BCA PART III SEMESTER VI
AECC- E
ENGLISH FOR COMMUNICATION (2241601)
SEE- 35 + CA- 15 = 50 marks

COURSE CREDITS 03L+01T=04　　COURSE CONTACT HOUR 60

Course Objectives:
- To make the students comprehend English language in general
- To enhance the quest for knowledge and correct pronunciations
- To strengthen oral and written communication skills with grammar accuracy
- To galvanize soft skills

Course Outcomes:

By the end of the course the students will be able to:
- Use oral and written English effectively and fluently
- Demonstrate their knowledge of correct pronunciations
- Apply English language skills and grammar accuracy in clearing competitive examinations
- Apply their knowledge of Soft Skills to succeed in career as well as in practical life.

Module No and Title:
Module. I: Prose
1. Growing Up:　　　　　　　Joyce Cary
2. God See the Truth, but Waits:　　Leo Tolstoy
3. On the Rule of The Road:　　A. G. Gardiner

Module. II: Poetry
1. Sita:　　　　　　　　　Toru Dutt
2. My Last Duchess:　　　　Robert Browning
3. Ode to Beauty:　　　　　John Keats
4. Song: Go and Catch a Falling Star:　John Donne

Module. III: Grammar
1. Simple and Multiple Sentences
2. Direct and Indirect Speech

Module. IV: Soft Skills
1.　Literacy Skills
2.　Life Skills
3.　Employability Skills

Reference Books:

BA/BSc Part III Compulsory English Literary Mindscapes-I PAH Solapur University Solapur (With 20%

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