Rayat Shikshan Sanstha's
Sadguru Gadage Maharaj College, Karad
(An Autonomous College)
Department of Computer Science
Syllabus for Bachelor of Science Part-III
Computer Science (Optional)

1. TITLE: ComputerScience

2. YEAR OF IMPLEMENTATION: The syllabus will be implemented from June, 2022onwards.

3. DURATION: The course shall be a fulltime.

4. PATTERN: Semesterexamination.

5. MEDIUM OF INSTRUCTION: English.

6. STRUCTURE OF COURSE:

<u>**FIFTH SEMESTER**</u>— (NO.OF PAPERS – 4)

		Theory				Practical	
Sr. No.	SUBJECT TITLE	PAPER NO and Paper Code	No. of lectures per week	Credits		No. of lectures Per week	Credits
1	Computer Science	Paper-IX: BCST501	12	8	Practical Paper V & VI (BCSP 508, BCSP 509)	20	8
		Paper-X: BCST502					
		Paper-XI: BCST503					
		Paper-XII: BCST50X (Elective:BCST504/505/506)					
		SECCCST507	01	01	SECCCSP510	02	01
		AECCCST	03	02	-	-	-

STRUCTURE AND TITLES OF PAPER OF B.Sc. COURSE:
B.Sc. III Semester V

Paper IX : BCST501: Software Engineering
Paper X : BCST502: Introduction to .NET using C#
Paper XI : BCST503: Advanced JAVA
Programming **Paper XII : BCST50X: Elective**

Elective : BCST50X
1. **BCST504**: Python Programming
2. **BCST505:** IOT
3. **BCST506:** MultimediaComputing

Practical Paper-V: BCSP508: Software Eengineering and Introduction to .NET using C#
Practical Paper-VI: BCSP509: Advanced JAVA Programming& P-XII

SECCCST507:**Numerical Skill:** Programming with SCILAB
SECCCSP510: Programming with SCILAB LAB
AECCCST : English

SIXTH SEMESTER—(NO.OF PAPERS - 4)

| Sr. No. | SUBJECT TITLE | PAPER NO and Paper Code | Theory | | | No. of lectures Per week | Practical | |
			No. of lectures per week	Credits			No. of lectures Per week	Credits
1	Computer Science	Paper-XIII: BCST601	12	8	Practical Paper VII & VIII (BCSP 608, BCSP 609)	20	8	
		Paper-XIV: BCST602						
		Paper-XV: BCST603						
		Paper-XVI: BCST60X (Elective:BCST604/605/606)						
		SECCCST 607	01	01	SECCCSP610	02	01	
		AECCCST	03	02	-	-	-	

STRUCTURE AND TITLES OF PAPER OF B.Sc. COURSE:

B.Sc. III Semester VI

Paper XIII : BCST601: E – Commerce
Paper XIV: BCST602: Advanced C# Programming
Paper XV : BCST603: Computer Graphics
Paper XVI : BCST60X: Elective

Elective : BCST50X
4. **BCST604** : Web Technology
5. **BCST605:** Artificial Intelligence(AI)
6. **BCST606:** Software ProjectManagement

Practical Paper-V: BCSP608:E – Commerce and Advanced C# Programming
Practical Paper-VI: BCSP609: Computer Graphics & P-XVI

SECCCST607: Entrepreneurship Development Program
SECCCSP610: Industrial Project
AECCCST: English

BCST/Pxyz:
B: B.Sc.
CS: Computer
Science T:

Theory
P: Practical
x: Semester I to VI yz: 01 to 10
SECC: Skill Enhancement Compulsory Course
AECC: Ability Enhancement Compulsory Course

Semester –V

Theory: Paper IX : BCST501: Software Engineering

Learning Objective:
1. Be successful professionals in the field with solid fundamental knowledge of software engineering
2. To utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinaryteams.
3. To apply their foundations in softwareengineering.
4. To adapt to readily changing environments using the appropriate theory, principlesand processes

UnitI:Introduction **(10)**
The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, life cycle d
evelopment process, life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented), Software Process Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration(CMMI).

Unit II: Software Processand requirements **(10)**
Introduction , S/W Engineering Paradigm , System engineering, computer based system, verification, validation, system engineering hierarchy. Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, S/W document. Analysis and modeling-data, functional and behavioral models, structured analysis and data dictionary.

Unit III: Design Conceptsand Principles **(12)**
Design process and concepts, modular design, design heuristic, design model and document, software architecture, data design, architectural design, transform and transaction mapping, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.

Unit IV: Testing and Trends inSoftwareEngineering **(13)**
Taxonomy of software testing, levels, test activities, types of s/w test, Black-Box Testing, White-Box Testing and their type, Basis Path Testing, unit testing, integration testing, validation testing, system testing and debugging, Testing boundary conditions, structural testing, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, Reverse Engineering and Re-engineering – wrappers – Case Study of CASE tools.

Recommended Books:
1. Software engineering, Roger S.Pressman,A practitioner's Approach, McGraw-Hill,5thedition,2001.
2. Software engineering, Ian Sommerville,Pearson education Asia, 6th edition,2000.
3. An Integrated Approach to Software Engineering, Pankaj Jalote- Springer Verlag,1997.
4. "Software Engineering – An Engineering Approach", John Wiley and Sons, James F Petersand

WitoldPedryez, New Delhi,2000.

5. Software Engineering Fundamentals, Oxford University Press, Ali Behforooz and FrederickJ Hudson,New Delhi,1996.
6. Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of SoftwareEngineering", Prentice Hall of India, New Delhi,1991.

Learning Outcomes:

Unit I: Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle

Unit II: Work as an individual and as part of a multidisciplinary team to develop and deliver quality software .

Unit III: An ability to work in one or more significant application domains.

Unit IV: Demonstrate an ability to use the techniques and tools necessary for practice.

Theory: Paper X: BCST502: Introduction to .NET using C#

Learning Objective(s):
1. Students will gain the ability to implement the algorithms in C#.net, VB.net andASP.net.
2. To provide the knowledge of Dot Net Frameworks along with C#.
3. To analyze object-oriented paradigm in the C # programminglanguage.
4. To understand different windows based applications using standard controlsand components.

Unit I:.NETArchitecture   **(12)**

Block diagram of .net framework, The Common Language Runtime, Advantages of Managed Code, A Closer Look at Intermediate Language &Assemb
lies, Support for Object Orientation and Interfaces, Distinct Value and Reference Types, Strong Data Typing, Garbage Collection

Unit II:C# Basics   **(12)**
Getting Started with Introducing C#, Inside a C# Program, Compiling and Running the Program,Variables,DataTypes,FlowControl,Enumerations,Namespaces,The using Statement, Namespace Aliases, The Main() Method, Multiple Main() Methods, defining & using functions & its scope, Passing Arguments to Main(),Parameter passing technique, Console I/O, Classes and Structs, Class Members, Data Members, Function Members, read-only Fields, properties and indexer, The Object Class, System. Object Methods, The ToString() Method, Delegates, Types of Delegates, Events, The Receiver's View of Events, Generating Events.

Unit III: InheritanceandPolymorphism   **(11)**
Introduction-Types of Inheritance, Implementation Inheritance, Abstract Classes and Functions Sealed Classes and Functions, Constructors in Derived Classes, Interfaces, Defining and Implementing Interfaces,DerivedInterfaces,Polymorphism,Methodoverloading,Operator overloading

Unit IV: Windowsbaseapplication   **(10)**
Creating a Windows Form Application, Standard Controls and Components, Properties and Events of the controls, Forms, Form Class, Multiple Document Interface (MDI),Custom Controls (user Controls)

Recommended books:
1. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press ©2001.
2. Beginning ASP.NET 3.5: Learn ASP.NET Step by Step, Wrox Publication,1st edition,2008
3. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly Media, Inc., 4thEdition,2008
4. ADO.NET Examples and Best Practices for C# Programmers, By Peter D.Blackburn Apress,2002.
5. Database Programming with C#, By Carsten Thomsen,Apress,2002.
6. Visual studio 2010 - A beginners guide - Joe Mayo, McGraw-Hill Education,1st edition,2010.
7. Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET" Tata Mcgraw Hill(2002 Edition).
8. Pro ASP.NET 4 in C# 2010, MacDonald and Freeman, Apress, 4th edition,2010.

Learning Outcomes:

Unit I: Student will be able to use the features of Dot Net Framework along with the features of C#

Unit II: Develop correct, well-documented programs using the C# programminglanguage**.**

Unit III: Evaluate object-oriented programs using C# classes andobjects.

Unit IV: Learn to use Windows Forms and WPF to create GUI-based programs.

Theory: Paper XI : BCST503: Advanced JAVA Programming

Learning Objective:

1. To obtain the basic knowledge of object oriented programming, concepts of basicJAVA ,advanced JAVA and Server side scripting(JSP).
2. Student will be able to develop distributed business applications, develop web pagesusing advanced server-side programming through servlets and Java serverpages.
3. To design and develop error-free, well-documented Java programs; test Java servletswhile developing Java programs which incorporate advanced graphicfunctions.
4. To Learn how to write, test, and debug advanced-level Object-Oriented programs usingJava.

UNIT I: Graphics ProgrammingUsingSwing (12)

Working with 2D Basic Shapes, Using Color, Using Font, Displaying Images, Swing-1 Concept, MVC architecture,2 Component of swing: JFrame, JComponent, JLable, JTextfields, JCheckbox, JPanel, JRadiobuttons, JTabbedPane, JButton, JTree, JTable, Jmenu, Difference between AWT and Swing.

Unit II: AWT andEventHandling (12)

AWT classes, Windows Fundamental: Component, Container, Panel, Window, Frame, Canvas, Working with graphics: drawing lines, rectangles, and circles. Event Handling: Event model, action event class, mouse event class, key event class, Listener interfaces: Action Listener, Mouse Listener, KeyListener, MouseMotionListener.

Unit III: Servletand JSP (10)

Introduction of servlet, Life cycle of servlet, Session, cookies,servletjdbc connection. Components of JSP: Directives, Tags, Scripting elements,simple application using JSP.

UnitIV:JDBC (11)

JDBC Introduction, JDBC Architecture, Types of JDBC Drivers,The Connectivity Model, The java.sql package, Navigating the ResultSet object's contents, Manipulating records of a ResultSet object through User Interface , The JDBC Exception classes, Database connectivity, Data Manipulation (using Prepared Statements, Joins, Transactions, StoredProcedures), Data navigation.

Text Book:

1. E. Balagurusamy**"Programming with Java – A Primer"**, TMH Publ,2ndEdition,2000.
2. Patrick Naughton and Herbert Scheldt "The Complete Reference Java 2**"**, 3rd Edition, TMH Publ, 2000.

Reference book:

1. J2EE, The Complete, Jim Keogh ,TMH Publication,2002
2. Head First Ejb, Kathy Sierra & Bert Bates, O'REILLY publications, October2003
3. Java server programming (J2EE 1.4) Black Book, Kogent Solutions Inc., Dreamtech Press ,2010
4. Head First Servlets &Jsp", Kathy Sierra & Bert Bates, O'REILLY publications, Kathy Sierra& Bert Bates, January2011
5. Java 2(Complete Reference) fourth Edition, P.Naughton and H.Schildt, Mcgraw-HillOsborne Media ,2000

Learning Outcomes:

Unit I: To design a graphical user interface (GUI) with Java Swing API.
Unit II: To use event handling in Java applications and to draw various shapes using AWT Components.
Unit III: To Develop JSP applications using JSP Tags, JSP Scriptlets and JSP Application Models.
Unit IV: To evaluate solid Java applications using Java Data Base Connectivity (JDBC) to interact with relational databases and how to do fundamental database activities utilizing JDBC (Java Database Connectivity) API.

Learning Objectives:
1. To learn basics of Introduction toIoT.
2. To understand state of Art -IoT Architecture & Market perspectivemodel.
3. To develop a grasp of the Android OS architecture and Understand theapplication developmentlifecycle
4. To familiarize with Android's APIs for data storage, retrieval, user preferences, filesand contentproviders

Unit -I: Introduction toIoTArchitecture (11)
Introduction to IoT: **-** Definition and Characteristics. Web of Things V/s Internet of Things: -Two pillars of the web, architecture standardization for WoT, Platform middleware for IoT, Unified multitier WoT architecture, WoT portals and Business Intelligence.M2M to IoT: M2M Communication, Trends in Information and Communication Technology, Implications for IoT,IoTArchitecture:Building architecture, Main design principles and needed capabilities, An IoT architectural overview.IoT Reference Model:IoT domainmodel.

Unit - II: AndroidDevelopmentEnvironment (14)
What is mobile Application Programming, Architecture and working of Android, What isAndroid, Future of Android, Tools and about Android SDK, Installing Java, Eclipse, and Android, Android Software Development Kit for Eclipse, Android Development Tool: Android Tools for Eclipse, AVDs: Smartphone Emulators, Image Editing. Android Software Development- Platform: Understanding Java SE and the Dalvik Virtual Machine, Directory Structure of an AndroidProject, Common Default Resources Folders, The Values Folder, Leveraging Android XML, Screen Sizes, Launching Your Application: The AndroidManifest.xml File, Creating Your First Android Application.

Unit III: Handling UserInterface(UI)Events (10)
Introducing the Drawables, Implementing Images, Core Drawable Subclasses, UsingBitmap,PNG, JPEG and GIF Images in Android, Creating Animation in Android,An Overview of UI Events in Android, Listening for and Handling Events , Handling UI Events via the View Class, Event Callback Methods,Handling Click Events, Touchscreen Events, Keyboard Events, Context Menus, Controlling theFocus.

Unit IV:ContentProviders (10)
An Overview of Android Content Providers, Defining a Content Provider, Working with a Database. Intents and Intent Filters: Intent, Implicit Intents and Explicit Intents, Intents with Activities, Intents with Broadcast Receivers.

TEXT BOOKS:
1. Internet of Things: Converging Technologies for smart Environments and IntegratedEcosystems, Dr. OvidiuVermesan, Dr. Peter Friess, RiverPublication.
2. From Machine to Machine to the Internet of Things: Introduction to a new AgeofIntelligence, Jan Hollar, VlasiosTsiasis Mulligan, Stefan Avesand, StamisKarnouskos,David Boyle, 1st Edition, Academic Press2014.

Recommended Books:

1. The Internet of Things: An Overview, Understanding the issues and Challenges ofMore Connected World,KarenRose,scotteldridge,lymanchapin,Internet Society, 1 st edition,2015.
2. Designing the Internet of Things,Adrian McEwen, HakimCassimally,Willy publication, 1 stEdition,2014.
3. Architecting the Internet of Things,DieterUckelmann, Mark Harrison,Springer BookSeries Publisher,Springer International , 1 stedition,2011
4. Beginning Android 4,GrantAllen,Apress Publication, 1 st edition,2012.
5. Professional Android 4 Application Development,CarmenDelessio ET AL,Pearson India,4 thedition, 2016 .
6. Beginning iOS 6 Development: Exploring the iOS SDK,DavidMark,Apress Publication, 1 st edition ,2011.
7. Programming with Mobile Applications: Android, iOS, and Windows Phone 10,ThomasDuffy, 1st Edition ,2013.

Learning Outcomes:

Unit I :. Identify and design the new models for market strategic interaction

Unit II : Build and deploy his/ her Android application.

Unit III : Students understand the operation of the application, application lifecycle, configuration files, intents, and activities.

Unit IV : Students also develop a working knowledge of the custom UI elements and positioning.

Learning Objectives:
1. To acquire programming skills in corePython.
2. To acquire Object Oriented Skills inPython
3. To develop the skill of designing Graphical user Interfaces inPython
4. To inculcate Problem solving and programmingcapability.

Unit -I: OverviewofProgramming **(10)**

Structure of a Python Program, Elements of Python, Hello worldapplication,Interpreters, modules,and a more interesting program,Variables,Names and Assignment,TypesInput and Output Statements.

Unit - II: IntroductiontoPython **(13)**

Python Interpreter, Using Python as calculator, Python shell, Indentation.Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

Unit-III: Creating Python ProgramsandStructures **(12)**

Control statements (Looping- while Loop, for Loop , Loop Control, Conditional Statement- if...else, Difference between break, continue and pass). Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.

Unit-IV: Introduction toAdvancedPython **(10)**

Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.

Recommended Books:
1. Introducing Python, Bill Lubanovic, Shroff/O'Reilly Publisher, 1st edition,2014
2. Core Python Programming, Dr. R. NageswaraRao, Dreamtech Press, 2nd edition2018
3. T. Budd, Exploring Python, TMH, 1st Ed,2011
4. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist :learning with Python , Freely availableonline.2012
5. Exploring Python, Timothy A.Budd, TMHpublishier, 1st Edition,2011.
6. How to think like a computer scientist : learning with Python,Peter Wentworth, Jeffrey Elkner,Allen B. Downey and Chris Meyers,O'rellypublishier 3 rd edition, 2012 .

Learning Outcomes:
 Unit I: Understand why Python is a useful scripting language for developers.
 Unit II: Learnt how to design and program Python applications.
 Unit III: Explain basic principles of Python programming language.
 Unit IV: Implementing database and GUI applications.

BCST506: Multimedia Computing

Learning Objectives:
1. To demonstrate how still images, sound, and video can be digitized on thecomputer.
2. The students in this course will create their own multimedia programs using softwaretools.
3. The students will formulate a working definition of interactivemultimedia.
4. To demonstrate competence in using the authoring multimediaprogram

Unit-I: Overview ofmultimediacomputing (08)

Definitions, terms, terminologies, characteristics and requirements of different media; components of multimedia systems.

Unit-II: visual andaudiosystem (12)

Human's visual and audio system Characteristics of human visual system, light and visible light; human retina structure and functions; non-perceptual uniform color models and perceptual uniform color models; Characteristics of human's audio system, frequency response and magnitude range.

Unit-III: Data RepresentationAndAnalysis (14)

Multimedia data representation and analysis Representation of sound/audio, image and video; speech generation, analysis and software; image analysis, display, and printing,coding And Compression Techniques -Multimedia coding and compression Coding requirements; compression principles; entropy and hybrid coding; compression standards: JPEG, MPEG, and etc. Multimedia technology development Multimedia history, technology development, challenging problem, research difficulty, multimedia industry

Unit-IV:Animation: (11)

The power of motion – Principles of Animation – Animation by computer – Making animations that work. Video : Using Video – How video works – Analog Display Standards – Digital Display standards – Digital Video – Video Recording and Tape formats – Shooting and Editing Video – Optimizing Video files

Text Book:
   1. TayVaughan,Multimedia: Making it work, Tata McGraw Hill Edition, VII Edition, 2009.

Reference Books:
   1. Fundamentals of Multimedia, Z.N. Li and M.S. Drew, Prentice Hall, 2nd edition2003
   2. Readings in Multimedia Computing and Networking. K. Jeffay and H. Zhang ,
      Morgan Kaufmann publisher ,1st edition2001.
   3. Principles of Multimedia, RanjanParekh, Tata McGraw-Hill Education publishier,
      2nd edition 2012 .
   4. Multimedia Computing, Communications &Applications, Ralf Steinmetz,KlaraNahrstedtm,
      Pearson Education,1stedition,2014.

Learning Outcomes:
Unit I : Understand the characteristics of different media, multimedia data,data formats;
Unit II : Learn the characteristics of human's visual system; understand the characteristics of
            human's audio system;
Unit III : Analyze different compression principles; understand different compression techniques;
            be able to design and develop multimedia systems according to the requirements of
            multimedia applications.
Unit IV: Be able to design and implement media applications; Attributes for all-roundedness and
            to learn independently and search for the information required in solving problems

SECCCST507: Programming with SCILAB

Learning Objectives:
1. To analyze knowledge of physics and mathematics is transformed into a computerprogram.
2. To provide a powerful computing environment for engineering and scientific applications, this includes hundreds of mathematical functions.
3. To introduce basic concepts of scientific programming usingScilab.
4. It has a high level programming language allowing access to advanced data structures,2-D and 3-D graphicalfunctions.

Unit I- IntroductiontoProgramming   (5L)
Definition, need, and types of programming languages and their selection criterion, Introduction to SCILAB (Features, capabilities and applications) and development environment, Program execution process and format. Concept and examples of built-in functions and the concept of toolboxes, Variables and constants: Definition, naming (identifiers or labels for different entities), initialization and accessing of variables. Constants and their representation, Data types-classification, memory requirement, range of values, usage and type specifiers.

Unit II-Controlstructure   (5L)
Branching: Conditional (if, if-else, nested and ladder if-else, switch constructs) and unconditional (break, continue and go to statements),Looping: Entry controlled (for and while),

Unit III-GraphPlots: (5L)
Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save, Statements-tokens and expressions, Standard input and output statements and plot functions, Escape characters.

Unit IV- Arrays/Matrices andstringsFunctions   (5L)
Definition, declaration, initialization (static and run-time or dynamic) and arrays, matrices and strings, Accessing of strings, array and matrices elements and relevant operations, Comparisonof built-in, library and user-definedfunctions.

Recommended Books:
1. SCILAB by Example , M.Affouf, Create Space Independent PublishingPlatform,2012
2. Introduction to Scilab: For Engineers and Scientists, by Sandeep Nagar,Apress; 1st ed. edition (13 December2017)
3. SCILAB(a Free Software to Matlab),Er. Hema Ramachandran and Dr. Achutsankar Nair, S. Chand Publishers, ISBN-10:8121939704,2011
4. Scilab: A Practical Introduction to Programming and Problem Solving Book byTejas Sheth,2016

Learning Outcomes:
 Unit I : Understand the main features of the SCILAB program development environment to enable their usage in the higher learning.
 Unit II : Implement simple mathematical functions/equations in numerical computing environment such as SCILAB.
 Unit III : Interpret and visualize simple mathematical functions and operations there on using plots/display.
 Unit IV : Analyze the program for correctness and determine/estimate/predict the output and verify it under simulation environment using SCILAB tools.

Practical Paper No.V
BCSP508: Lab Course - Software Engineering and Introduction to .NET using C# Lab

Learning Objectives:
1. You will broaden your knowledge of softwareengineering.
2. You will learn Software testing algorithms andprograms.
3. To provide the knowledge of Dot Net Frameworks along with C#
4. To analyze object-oriented paradigm in the C # programminglanguage

Part A: Software Engineering Lab
Sample Projects
1. DTC Route Information: Online information about the bus routes and their frequencyand fares
2. Car Pooling: To maintain a web based intranet application that enables thecorporate employees within an organization to avail the facility of carpoolingeffectively.
3. Patient Appointment and Prescription ManagementSystem
4. Organized Retail Shopping ManagementSoftware
5. Parking AllocationSystem
6. Wholesale ManagementSystem

Roadmap of Experiment:
1. Practical Title
   - ProblemStatement,
   - ProcessModel
2. RequirementAnalysis
   - Creating a DataFlow
   - DataDictionary,
   - UseCases
3. ProjectManagement
   - ComputingFP
   - Effort
   - Schedule, Risk Table, Timeline chart
4. DesignEngineering
   - Architectural Design
   - Data Design, Component LevelDesign
5. Testing
   - Basis Path Testing

Part B: Introduction to .NET using C# Lab
Exercise:
1. Write a menu driven of a]Face value b]Armstrongc]Palindrome.
2. Write a program to overloadmethod.
3. Write a program for static class and partialclass.
4. Write a program for static property andindexer.
5. Write a program to implement inheritance and interface.
6. Write a program to overloadingoperator.
7. Write a program fordelegate.
8. Write a program creating files & directories & display the following attribute-
   1]Name 2]Size 3]Get creation time by using windowsapplication.

Reference books:
1. Software engineering, Roger S.Pressman,A practitioner's Approach, McGraw-Hill,5thedition,2001.
2. Software engineering, Ian Sommerville,Pearson education Asia, 6th edition,2000.
3. An Integrated Approach to Software Engineering, Pankaj Jalote- Springer Verlag,1997.
4. "Software Engineering – An Engineering Approach", John Wiley and Sons, James F Petersand WitoldPedryez, New Delhi,2000.
5. Software Engineering Fundamentals, Oxford University Press, Ali Behforooz and FrederickJ Hudson,New Delhi,1996.
6. Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of SoftwareEngineering", Prentice Hall of India, New Delhi,1991.
7. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â©2001.
8. Beginning ASP.NET 3.5: Learn ASP.NET Step by Step, Wrox Publication,1st edition,2008
9. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly Media, Inc., 4th Edition,2008
10. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. BlackburnApress,2002.
11. Database Programming with C#, By Carsten Thomsen,Apress,2002.
12. Visual studio 2010 - A beginners guide - Joe Mayo, McGraw-Hill Education,1st edition,2010.
13. Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET" Tata Mcgraw Hill(2002 Edition).
14. Pro ASP.NET 4 in C# 2010, MacDonald and Freeman, Apress, 4th edition,2010.

Learning Outcomes:
1. Demonstrate an understanding of and apply current theories, models, and techniquesthat provide a basis for the softwarelifecycle
2. Demonstrate an ability to use the techniques and tools necessary forpractice.
3. Student will be able to use the features of Dot Net Framework along with the features ofC#.
4. Develop correct, well-documented programs using the C# programming language.

Practical Paper No.VI

BCSP509: Lab Course- Advanced Java Programming and IOT/ Python **/** Multimedia Computing

Learning Objectives: -
1. To learn how to design a graphical user interface (GUI) with Java Swing andAWT.
2. Develop application using JSP andServlet.
3. Develop a grasp of the Android OS architecture and understand the application developmentlifecycle.
4. Familiarize with Android's APIs for data storage, retrieval, user preferences, filesand contentproviders.

Part-A
Advanced Java Programming Lab

Exercise No.1 Programs on AWT, Swing and Database
1. Program onSwing
2. Program onAWT
3. Program on DatabaseConnection

Exercise No.2 Programs on JDBC, Jsp and Cookie & Session
1. Program on cookie andSession
2. Program on Servlet JDBC
3. Simple application usingJSP.

Exercise No.3 Programs on Servlet and SQL
1. Write a java program to implement the SQL login ID commands usingJDBC.
2. Write a program to demonstrate the concept of SQL exception, SQLwarning.
3. Write a program to create a servlet to read theparameters

Exercise No.4 Programs on SQL commands and JDBC Connection
1. Write a java program to implement theList.
2. Write a java program to implement the SQL commands usingJDBC
3. Write a program to illustrate the use of JDBCconnection

Elective
BCST504: IoT
Part-B

1. To develop an application that uses GUI Components, Fonts andColors.
2. To develop an application that uses Layout Managers and EventListeners.
3. To develop a native calculatorapplication.
4. To develop an application that makes use ofdatabase.
5. To implement an application that writes data to the SD card.
6. To develop an application that draws basic graphical primitives on thescreen.
7. To implement an application that implementsmultithreading.
8. To implement an application that creates an alert upon receiving amessage.

OR
Elective
BCST505: Python Programming
PartB:

Software Lab using Python:
Section: I (Simple programs)
1. Write a menu driven program to convert the given temperature from Fahrenheit toCelsius and vice versa depending upon user'schoice.

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2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in eachof the three subjects are to be input by theuser.
3. Write a menu-driven program, using user-definedfunctions
    i. To find the area of rectangle, square, circle and triangle by acceptingsuitable input parameters from user.
    ii. WAP to display the first n terms of Fibonacciseries.
    iii. WAP to find factorial of the given number.
    iv. WAP to find sum of the following series for n terms: $1 – 2/2!+3/3!---------- n/n!$
    v. WAP to calculate the sum and product of two compatiblematrices.

Section: II (Visual Python):

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3Dobjects
    I. curve
    II. sphere
    III. cone
    IV. arrow
    V. ring
    VI. Cylinder.
2. WAP to read n integers and display them as ahistogram.
3. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are tobe entered by theuser.
4. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegratesaccording
5. to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t>=0$.
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p growsas follows: $P(t) = (15000(1+t))/(15+e)$
   where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
7. Input initial velocity and acceleration, and plot the following graphs depicting equationsof motion:
    I. velocity wrt time$(v=u+at)$
    II. distancewrt time $(s=u*t+0.5*a*t*t)$
    III. distancewrt velocity ($s=(v*v-u*u)/2*a)$

OR
Elective
BCST506: Multimedia Computing
Part-B

List of Practical:
1. Create Rain Drops using Multimedia Tools
2. Create Logo using MultimediaTools.
3. Create an advertisement banner in MultimediaTools.
4. Create Marriage Invitation using MultimediaTools.
5. Using Multimedia Tools-
    i. create a growing plant animation using keyframes
    ii. Using Multimedia Tools create web site with rolloverbutton.
6. Create an animation using shapetweening.
7. Create an animated website.
8. Create a presentation for a collegefunction.

Reference books:
1. J2EE, The Complete, Jim Keogh ,TMH Publication,2002
2. Head First Ejb, Kathy Sierra & Bert Bates, O'REILLY publications, October2003
3. Java server programming (J2EE 1.4) Black Book, Kogent Solutions Inc., Dreamtech Press ,2010
4. Head First Servlets &Jsp", Kathy Sierra & Bert Bates, O'REILLY publications, Kathy Sierra& Bert Bates, January2011
5. Java 2(Complete Reference) fourth Edition, P.Naughton and H.Schildt, Mcgraw-Hill Osborne Media ,2000
6. The Internet of Things: An Overview, Understanding the issues and Challenges ofMoreConnected World,KarenRose,scotteldridge,lymanchapin,Internet Society, 1 st edition,2015.
7. Designing the Internet of Things,Adrian McEwen, HakimCassimally,Willy publication,1 stEdition,2014.
8. Architecting the Internet of Things,DieterUckelmann, Mark Harrison,Springer Book Series Publisher,Springer International , 1 stedition,2011
9. Beginning Android 4,GrantAllen,Apress Publication, 1 st edition,2012.
10. Professional Android 4 Application Development,CarmenDelessio ET AL,Pearson India, 4 thedition, 2016.
11. Beginning iOS 6 Development: Exploring the iOS SDK,DavidMark,Apress Publication, 1 stedition ,2011.
12. Programming with Mobile Applications: Android, iOS, and Windows Phone 10,Thomas Duffy, 1st Edition ,2013.

Learning Outcomes:
1. To design and develop web applications to establish a JDBC connection betweendatabase andapplications.
2. To learn to access database through Java programs, using Java Data BaseConnectivity.
3. To learn create dynamic web pages, using Servlets andJSP.
4. Build and deploy his/ her Androidapplication.

Sem-V: Numerical Skill
SECCCSP510: Lab Course - Programming with SCILAB lab

Learning Objectives:
1. To analyze knowledge of physics and mathematics is transformed into a computerprogram.
2. To provide a powerful computing environment for engineering and scientific applications, this includes hundreds of mathematical functions.
3. To introduce basic concepts of scientific programming usingScilab.
4. It has a high level programming language allowing access to advanced data structures,2-D and 3-D graphicalfunctions.

Software Lab Based on SCILAB:
1. Display your countryname.
2. Compute the area and circumference of a circle given theradius.
3. Compute simple interest given the interest rate, principal andduration.
4. Solve-
   a) Factorial of a single digitnumber.
   b) Swap contents of two variables without using intermediatevariables.
   c) Absolute value of anumber.
   d) Largest of threenumbers.
   e) Logarithm of anumber.
5. $Y=\sin(\theta1+\theta2)+\cos(\theta1-\theta2)$ given $\theta1$ and $\theta2$ indegrees.
6. Average of the numbers in 3x4matrix.
7. Plot discharging voltage acrosscapacitor.
8. Analyze theprogram

   Given the program or block of program (Matlab or Scilab), analyze the program and estimate/predict/record the output or error as the case may be. Instruct the student to justify the answer/output.

   [For e.g., A=246; B=-90; C=A+B*(10/A) +100; sprintf ('%f', C); in Matlab] Such analysis should be carried out for all the concepts covered in this course.

Recommended Books:
1. SCILAB by Example , M.Affouf, Create Space Independent PublishingPlatform,2012
2. Introduction to Scilab: For Engineers and Scientists, by Sandeep Nagar,Apress; 1st ed. edition (13 December2017)
3. SCILAB(a Free Software to Matlab),Er. Hema Ramachandran and Dr.Achutsankar Nair, S. Chand Publishers, ISBN-10:8121939704,2011
4. Scilab: A Practical Introduction to Programming and Problem Solving Book by Tejas Sheth,2016

Learning Outcomes:
1. Understand the main features of the SCILAB program development environment toenable their usage in the higherlearning.
2. Implement simple mathematical functions/equations in numerical computingenvironment such asSCILAB.
3. Interpret and visualize simple mathematical functions and operations thereon using plots/display.
4. Analyze the program for correctness and determine/estimate/predict the output and verifyit under simulation environment using SCILABtools.

Semester –VI

| Sr. No. | SUBJECT TITLE | PAPER NO and Paper Code | Theory | | | Practical | |
			No. of lectures per week	Credits		No. of lectures Per week	Credits
1	Computer Science	Paper-XIII: BCST601	12	8	Practical Paper VII & VIII (BCSP 608,BCSP 609)	20	8
		Paper-XIV: BCST602					
		Paper-XV: BCST603					
		Paper-XVI: BCST60X (Elective:BCST604/605/606)					
		SECCCST607	01	01	SECCCSP610	02	01
		AECCCST	03	02	-	-	-

STRUCTURE AND TITLES OF PAPER OF B.Sc. COURSE:

B.Sc. III Semester VI

Paper XIII : BCST601: E – Commerce
Paper XIV: BCST602: Advanced C# Programming
Paper XV : BCST603: Computer Graphics
Paper XVI : BCST60X: Elective

Elective : BCST60X
1. **BCST604** : ArtificialIntelligence(AI)
2. **BCST605:** Webtechnology
3. **BCST606:** Software ProjectManagement

Practical Paper-V: BCSP608: E – Commerce and Advanced C# Programming
Practical Paper-VI: BCSP609: Computer Graphics & P-XVI

SECCCST607: Entrepreneurship Development Program
SECCCSP610: Industrial Project
AECCCST: English

Semester VI
Theory: Paper XIII: BCST601: E – Commerce

Learning Objectives:
1. To understand the complexity of e-commerce and its manyfacts.
2. To explore how e-business and e-commerce fittogether.
3. To recognize the benefits and limitations ofe-commerce.
4. To identify the main barriers to the growth and development of e-commercein organizations.

Unit -I: An introduction toElectroniccommerce   (10)
What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, 9 Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C)

Unit - II:InternetSecurity   (12)
Secure Transaction, Computer Monitoring, Privacy on Internet, Corporate Email privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorization and Authentication, Firewall, Digital Signature(How it Works)

Unit-III : ElectronicDataExchange   (12)
Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model, Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash

Unit IV: Planning forElectronicCommerce   (11)
Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites, **Internet Marketing**: The PROS and CONS of online shopping, The cons of online shopping, Justify an Internet business, Internet marketing techniques, The E-cycle of Internet marketing, Personalization e-commerce.

Recommended Books

1. E-Commerce Concepts, Models, Strategies- G.S.V.Murthy, Himalaya Publishing House,2011.
2. E- Commerce by Kamlesh K Bajaj and DebjaniNag , Tata McGraw-Hill Education,2005.
3. Electronic commerce, Gray P. Schneider , International Student,10th Edition,2011,
4. E-Commerce, Fundamentals And Applications, Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, Wiely Student Edition,2001.

Learning Outcomes:

Unit I : Gain a comprehensive understanding of the E-Commerce landscape, current and emerging business models, and the technology and infrastructure underpinnings of the business.

Unit II: Develop an understanding on how internet can help business grow **.**

Unit III: Able to understand on the importance of security, privacy, and ethical issues as they relate to E-Commerce.

Unit IV: Will be able to Recognize the impact of Information and Communication technologies, especially of the Internet in business operations

Theory: Paper XIV : BCST602: Advanced C# Programming

Learning Objective:
1. To Streamline data-centric applications with C# extended features and the EntityFramework
2. To Integrate Microsoft Core with .NET Framework applications for high-performance data access.
3. To analyze the various stages in the processing of web forms and different types ofcontrols.
4. To implement and deploy thewebsite.

Unit I: Exception HandlingandThreading (10)
Try, catch, throw, finally, Nested try, Custom exception, What is threading? Applications with Multiple ,Threads, Thread Priorities, Synchronization

Unit II: File I/OandStreams (12)
Working with Drives, Directories, and Files, TheDriveInfoClass, The Directory and DirectoryInfo ,Classes, File and FileInfo, Working with Paths, File and Directory Properties, Attributes, and Access, Control, Lists, Reading and Writing Files, Streams, Readers and Writers, Compressing Streams.

UnitIII:ASP.NET (12)
Building a Web Application, Examples Using Standard Controls, Using HTML Controls, Validating Form Input Controls using Validation Controls, Understanding Applications and State, Applying Styles, Themes, and Skins, Creating a Layout Using Master Pages, Binding to Databases using Controls, Creating a Site Navigation Hierarchy, Navigation Controls , Membership and Role Management, Login Controls, Securing Applications Caching For Performance, Working with XML, Using Crystal Reports in Web Forms.

UnitIV:DBMS (11)
Databases: Introduction, Data Management with ADO.net, Using SQL to work with database, retrieving and manipulating data with SQL, working with ADO.NET, ADO.NET architecture, introduction to MVC architecture, deploying the web site.

Recommended Text and Reference books:
1. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â©2001.
2. Beginning ASP.NET 3.5: Learn ASP.NET Step by Step, Wrox Publication,1st edition,2008
3. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly Media, Inc., 4thEdition,2008
4. ADO.NET Examples and Best Practices for C# Programmers, By Peter D.Blackburn Apress,2002.
5. Database Programming with C#, By Carsten Thomsen,Apress,2002.
6. Visual studio 2010 - A beginners guide - Joe Mayo, McGraw-Hill Education,1st edition,2010.
7. Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET" Tata Mcgraw Hill(2002 Edition).
8. Pro ASP.NET 4 in C# 2010, MacDonald and Freeman, Apress, 4th edition,2010.

Learning Outcomes:
Unit I: Evaluate the useful and advanced concepts in C# like multithreading, error handling, exception.
Unit II: Analyze the new features that are unique to C# such as file stream reading and writing.
Unit III:. Understand the features of ASP.NET version 2.0 and the various stages in the processing of web forms and different types of controls such as server controls, web controls etc.
Unit IV: Applying how ADO.NET is used in web development using ASP.NET and the concept of files and how database connection is established.

Theory: Paper XV: BCST603: Computer Graphics

Learning Objectives:
1. To understand the basics of various input and output computergraphics.
2. To make the student present the contentgraphically.
3. To Gain knowledge about graphics hardware andsoftware.
4. To create and use Various 2D and 3D objects transformationtechniques

Unit-I Basic ofComputerGraphics   (12)
Overview of Computer Graphics, Computer Graphics Application and Software, Description of some graphics devices, Input Devices for Operator Interaction, Active and Passive Graphics Devices, Display Technologies, Storage Tube Graphics Displays, Calligraphic Refresh Graphics Displays, Raster Refresh (Raster-Scan) Graphics Displays, Cathode Ray Tube Basics, Color CRT Raster Scan Basics, Video Basics, The Video Controller, Random-Scan Display Processor, LCD displays.

Unit-IIGraphicsPrimitive   (10)
Graphics programming, initializing the graphics, Graphical functions, simple
Programs Point Plotting Techniques, Qualities of good line drawing algorithms, The Digital Differential Analyzer (DDA), Bresenham's Algorithm, Generation of
Circles.

Unit-III Two-Dimensional andThree-DimensionalTransformations   (13)
Introduction of Transformations, Types,Transformations and Matrices, Transformation Conventions, Homogeneous Coordinates and Matrix Representation of 2D and 3D Transformations, Translations , Rotation, Reflection, Scaling,Shearing . Combined Transformation,Transformation of Points.

Unit-IV Clipping TechniquesandOpenGL   (10)
Clipping, Need for Clipping ,Types of Clipping,Point Clipping, Line Clipping, Text Clipping, Mid Point Subdivision Line Clipping Algorithm, Drawing Polygon,Introduction to OpenGL, Features in OpenGL, OpenGL operations, Abstractions in OpenGL – GL, GLU & GLUT, 3D viewing pipeline, viewing matrix specifications, a few examples and demos of OpenGL programs.

Reference Books:
1. Computer Graphics, D.HearnAndP.Baker - Pearson Eduction - C Version2002
2. Computer Graphics, with OpenGL Hearn and Baker, Pearson Education India; 3rd edition(2013)
3. Computer Graphics, Sinha &Udai, - TMH ,McGraw Hill Education (14 August2007)
4. Computer Graphics: Principles and Practice , Addison-Wesley,2014
5. Computer Graphics using OpenGL, F. S. Hill Jr., 3rd Edition Pearson Education,2003.

Learning Outcomes:
Unit I : To identify the various computer graphics, graphics devices.Able to learn about graphics techniques and graphics displays.
Unit II : To understand the graphics programs and implementation,graphics functions and how to apply it. Able to learn about drawing various shape using graphics.
Unit III : To evaluate 2D and 3D viewing technologies, Various 2D and 3D objectstransformation techniques and to understand programming using 2D and 3Dtransformation.
Unit IV: To demonstrate clipping techniques and drawing various shape using
it. To able to learn OpenGL, its operations and programming usingOpenGL.

BCST604: Artificial Intelligence (AI)

Learning Objectives:
1. To create appreciation and understanding of both the achievements of AI and the theory underlying thoseachievements.
2. To introduce the concepts of a Rational Intelligent Agent and the different types ofAgents that can be designed to solveproblems
3. To review the different stages of development of the AI field from human like behavior to RationalAgents.
4. To impart basic proficiency in representing difficult real life problems in a state space representation so as to solve them using AI techniques like searching and gameplaying.

Unit-I:Introduction **(11)**
Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior andenvironment

Unit - II: Problem Solving andSearchingTechniques **(12)**
Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, DepthFirst Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.

Unit - III:InternetSecurity **(10)**
Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs. Programming in Logic (PROLOG)

Unit-IV: Dealing with UncertaintyandInconsistencies **(12)**
Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations. Understanding Natural Languages:ParsingTechniques, Context-Free and Transformational Grammars, Recursive and Augmented TransitionNets.

Recommended Books:
1. Introduction to A.I and Expert Systems by DAN.W. Patterson – PHI,2007.
2. Artificial Intelligence-A Modern Approach**,** Russell &Norvig, LPE, Pearson Prentice Hall,2nd edition, 2005.
3. Artificial Intelligence by Rich & Knight Published by Tata McGraw-Hill Education Pvt. Ltd., 2008
4. Programming in PROLOG, W.F. Clocksin and Mellish, Narosa Publishing House, 3rd edition, 2001.
5. Prolog Programming for Artificial Intelligence, Ivan Bratko, Addison-Wesley,Pearson Education, 3rd edition,2000.

Learning Outcomes:
Unit I: Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
Unit II: Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.
Unit III: Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
Unit IV: Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning.

Learning Objective(s):
1. Student will be familiar with client serverarchitecture.
2. Able to develop a web application using javatechnologies
3. Students will gain the skills and project-based experience needed for entry intoweb application and developmentcareers.
4. Learning different web related technologies currentlyused.

Unit I:Web Essentials   **(10)**
Introduction ,Web Essentials: Clients, Servers, Communication, Basic Internet Protocols, HTTP Request Message, HTTP Response Message, HTTPS protocol, Web Clients, Generations of web applications

Unit II: Introduction toClient-SideProgramming   **(12)**
Introduction to JavaScript, Basic Syntax, Variables and Data Types, Statements,Operators,literals, functions. JavaScript Objects–properties, references, methods,constructors, Arrays, other built-in objects, Debugging JavaScript, Introduction to Host Objects, Document Object Model (DOM), Document tree, DOM event handling, jquery,YUILibrary

Unit III:Server-SideProgramming   **(12)**
Java servlet: architecture, life cycle. The Client Request – form data, request headers.The Server Response- HTTP Status Codes, HTTP Response Headers. Sessions, Cookies,URL Rewriting, Concurrency in servlets, Separating Programming and Presentation: Java server pages, Basic JSP, JavaBeans Classes and JSP, JSF, Java Database Connectivity (JDBC), PHP

Unit IV: RepresentingWebData   **(11)**
XML–Namespaces, AJAX–Overview, basics, toolkits, security, DOM based XML processing, XSL, XPath, XSLT, Content Management Frameworks (Drupal, Joomla,etc.)Web configuration security:Apache Security, Nginx Security, jBoss Remote Command Execution ,Tomcat Remote Command Execution ,HTTP Parameter Pollution

Text Books:
1. Jeffrey C.Jackson, "Web Technologies : A Computer Science Perspective",Pearson Education, 2ndedition,
2. Hanqing Wu, Liz Zhao "Web Security: A WhiteHat Perspective" CRCpress

References:
1. "Core Web Programming", Marty Hall, Larry Brown ,Pearson Education, 2ndEdition,2001.
2. "Programming the World Wide Web", Robert. W. Sebesta, Pearson Education, 4thEdition,2007.
3. "Internet & World Wide Web How To Program", H.M. Deitel, P.J. Deitel and A.B. Goldberg,Pearson Education, 3rd Edition,2006.

Learning Outcomes:
Unit I: Understand the fundamental of web protocols.
Unit II: Learning different web related technologies currently used.
Unit III: Studying data handling in web systems.
Unit IV: Analyzing wide range of web security vulnerabilities and issues.

Learning Objectives:
1. Understand the fundamental principles of Software Projectmanagement.
2. Grasp good knowledge of responsibilities of project manager and how to handlethese.
3. Be familiar with the different methods and techniques used for projectmanagement.
4. To learn Software Metrics and QualityStandards.

Unit I: Introduction to Project Managementand Components (12)
What is Project? What is Project management? Project phases and project life cycle, organizational structure, Qualities of Project Manager.Project Management Components- Project Integration Management-Project plan development and execution, change controls, configurationmanagement.

Unit II: Scope,Time andCostManagement (10)
Scope Management-Strategic planning ,scopeplanning,definition ,verification andcontrol.Time management- Activity planning, schedule development and control.Cost Management- Cost estimation andControl.

Unit III: Quality andRisk Management (11)
Quality Management -Quality planning and assurance. Human Resource Management-Organizational planning , staff acquisition.Communication Management-Information distribution , reporting. Risk Management-Risk identification,Quantification and control.Procurement Management- Solicitation, contract administration.

Unit IV: Software Metrics andQualityStandards (12)
Software Metrics- The scope of software metrics, software metrics data collection, analyzing software data, measuring size, structure, external attributes. Software Reliability- Measurementand prediction, resource measurement, productivity, teams and tools.Planning a measurement program. What is metrics plan?: Developing goals, questions and metrics. Where and When: Mapping measures to activities. How: Measurement tools. Who: Measurers , analyst, tools revision plans.Quality Standards – CMM,PSP/TSP

Recommended books:
1. Information Technology Project Management, 7th Edition KathySchwalbe,2012.
2. Software Metrics: A rigorous and Practical Approach by Norman E. Fenton andShari Lawrence Pfleeger, International Thomson Computer Press, second edition,1996.
3. Software Engineering: A Practioner's Approach by Roger S. Pressman,TMH,6th edition2005.
4. Practical Software Metrics for Project Management and Process Improvement RobertB. Grady, Prentice hall,4thedition,2002.

Learning Outcome:
Unit I: Understand the fundamental principles of Software Project management & will also have a good knowledge of responsibilities of project manager and how to handle these.
Unit II : Be familiar with the different methods and techniques used for project management.
Unit III: Evaluating good knowledge of the issues and challenges faced while doing the Software project Management and will also be able to understand why majority of the software projects fails and how that failure probability can be reduced effectively.
Unit IV: Will be able to do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques

Semester VI
SECCCST607: Entrepreneurship Development

Learning objectives:
1. To study the product design and developmentprocess
2. Identification of apportunities fordevelopment
3. To learn the machanism of finance and fundraising
4. To understand the importance of marketing for better businessopportunities

Unit I: Entrepreneurship, Creativity&Opportunities   05

Concept, Classification &Characteristics of Entrepreneur, Creativity and Risk taking, Risk Situation, Types of risk& risk takers, Business Reforms,Process of Liberalization, Reform Policies,Impact of Liberalization,Emerging high growth areas, Business Idea Methods and techniques to generate business idea, Transforming Ideas in to opportunities transformation involves, Assessment of idea&Feasibility of opportunity SWOT Analysis

Unit II: Information andSupport Systems   05

Information needed and Their Sources: Information related to project, Information related to support system, Information related to procedures and formalities, Support Systems Small Scale Business Planning, Requirements, Govt. & Institutional Agencies, Formalities Statutory Requirements and Agencies.**Market Assessment-**Marketing - Concept and Importance Market Identification, Survey Key components Market Assessment

Unit III: Business Finance&Accounts   05

Business Finance- Cost of Project Sources of Finance Assessment of working capital Product costing Profitability Break Even Analysis Financial Ratios and Significance **Business Account**- Accounting Principles, Methodology Book Keeping Financial Statements Concept of Audit.**Business Plan** Business plan steps involved from concept to commissioning, Activity Recourses, Time, Cost **Project Report** Meaning and Importance, Components of project report/profile (Give list), Project Appraisal: 1) Meaning and definition 2) Technical, Economic feasibility 3) Cost benefitAnalysis

Unit IV: Enterprise Management andModernTrends   05

Enterprise Management- Essential roles of Entrepreneur in managing enterpriseProduct Cycle: Concept and importance Probable Causes of Sickness Quality Assurance: Importance of Quality, Importance of testing E-Commerce: Concept and Process

Electronics Entrepreneur- Assess yourself-are you an entrepreneur? Prepare project report for electronics and study its feasibility.

Recommended Books:
1. R. G. Kaduskar, V. B. Baru. Electronic Product Design. Second edition Wiley India
2. G. N. Pandey. A complete guide to successful Entrepreneurship, Vikaspublisher,1994.
3. Entrepreneurship, AlpanaTrehan, Wiley India Publishers, (1st Ed.)2011.
4. Complete guide to successful Entrepreneurship, G.N.Pande, S.Chand (G/L) & Company Ltd ., 1994.

Learning Outcomes:
Unit I: Able to identify feasibility of product design and development.
Unit II: Able to get the idea about IP rights.
Unit III: Avail the financial and marketing skill.
Unit IV: Able to prepare the proposal for small scale industry.

Semester VI
Practical Paper No.VII
BCSP608: Lab Course - E-Commerce and Advanced C# Programming Lab

Learning Objectives:

1. Learn to design web page usinghtml.
2. Develop familiarity with the JavaScriptlanguage.
3. To develop, implement and creating Applications withC#.
4. To implement, and demonstrate Component Services, Threading, Remoting, Windowsservices, web

Part A:
E-Commerce Lab

Exercise No.1 Programs on Html

1. Write a HTML program to design a form which should allow to enter your personaldata.
(Hint: make use of text field, password field, e-mail, lists, radio buttons, checkboxes, submit button)

2. Write html code to generate followingoutput.
 • Coffee
 • Tea
   o BlackTea
   o GreenTea
 • Milk.

3. Write a HTML code to generate followingoutput

Name :	
Password	
Confirm Password	
City	Select City ▾
Gender	○ Male ○ Female
Gmail	
Submit	

Exercise No.2 CSS and JavaScript

1. Design a CSS to createmenu.
2. Design a webpage i.e. Bio data usingCSS.
3. Write a program to create table and list usingCSS.
4. Design a home page usingjavascript.

Exercise No.3 Programs on ASP and XML

1 .Create a web page and display data fromdatabase.

2 . Create a simple XML document to display addressbook.

Part B:
Advanced C#Programming

1. Write a program forthread.
2. Write a program for Reading/Writing file by using byte streamclass.
3. Write a program for copy one file to anotherfile.

4. Simple application using webcontrols
   a) Finding factorialValue
   b) MoneyConversion
   c) QuadraticEquation
   d) TemperatureConversion
   e) Login control
5. Calendarcontrol
   a) Display messages in a calendarcontrol
   b) Display vacation in a calendarcontrol
   c) Selected day in a calendar control usingstyle
6. Treeviewcontrol
   a) Treeview control anddatalist
   b) Treeviewoperations
7. Use of Validationcontrols.
8. Simple Applications usingdatabase
   a) Creating Master page with Multi-form webapplications.
   b) Create a web page for student and display their records using insert, delete,update, showoperation.
   c) Report creation using crystalreport

Recommended Books:

1. "Core Web Programming", Marty Hall, Larry Brown ,Pearson Education, 2ndEdition,2001.
2. "Programming the World Wide Web", Robert. W. Sebesta, Pearson Education, 4thEdition,2007.
3. "Internet & World Wide Web How To Program", H.M. Deitel, P.J. Deitel andA.B.
   Goldberg,Pearson Education, 3rd Edition,2006.
4. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press ©2001.
5. Beginning ASP.NET 3.5: Learn ASP.NET Step by Step, Wrox Publication,1st edition,2008
6. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly Media, Inc., 4th Edition,2008
7. ADO.NET Examples and Best Practices for C# Programmers, By Peter D.Blackburn Apress,2002.
8. Database Programming with C#, By Carsten Thomsen,Apress,2002.

Learning Outcomes:-
1. Able to learn how to build real world creative and modern website.
2. Creating ASP.Net applications using standard .net controls.
3. Learn the basics and history of XML and how to write your own XMLdocuments.
4. You will learn how to make your pages dynamic based upon userinteraction.
5. To understand and be able to explain Security in the .NET framework and Deployment inthe .NET.
6. To develop Assemblies and Deployment in .NET, Mobile ApplicationDevelopment.

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Semester VI

Practical Paper No. VIII

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BCST609: Lab course –Computer Graphics **and** Artificial Intelligence(AI)/ Web Technology
/Software Project management Lab

Learning Objectives:-
1. To make the student present the contentgraphically.
2. To learn how to use graphics commands and Functions in graphics.
3. To develop OpenGL programming ingraphics.
4. Write PROLOG programs to solve a variety ofproblems.
5. Develop and test Prolog programs using a suitable Prologinterpreter.

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Part A :

Computer Graphics lab

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Exercise No.1 Programs on Graphics Basics
1. Introduction to various graphicscommands.
2. Develop the DDA Line drawingalgorithm

Exercise No.2 Programs on Operations and Functions
1. Draw basic graphicsconstruction
2. Functions inGraphics.

Exercise No.3 Programs on 2D and 3D Transformation
1. Translation, Rotation, and Scaling using CompositeTransformation
2. Implement Standard Perspective Projection in3-Dimensions.

Exercise No.4 Programs on Clipping and OpenGL
1.To implement Point Clipping.
2. To implement OpenGLprogramming.

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Elective
BCST604: Artificial Intelligence Lab
PartB:

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Lab Experiments: Write a prolog program to
1. Calculate the sum of two numbers.
2. Find the maximum of twonumbers.
3. Calculate the factorial of a givennumber.
4. Calculate the nth Fibonaccinumber
5. Remove the Nth item from alist.
6. Remove- n[th] (Before, After) that asserts the After list is the Before list with the removal of every n[th] item from every list at alllevels.
7. Implement append for twolists.
8. Implement palindrome(List).

BCST605: Web TechnologyLab
PartB:

Lab Experiments:
1. Create YCIS COLLEGE website using HTMLtags.
2. Create calculator format using javascript.
3. Add a simple script using Clickevent
4. Create Employee details usingschemas.
5. Change the color of the old image to new image and apply filtereffects.
6. Draw an image in flash and Working with differentlayers.
7. Creating a banner –Typography.
8. Animation with different layers with addingsounds

BCST606: Software Project ManagementLab
PartB:

Lab Experiments:-
1. For Internal Evaluation group-wise case study iscompulsory.
    i. AbnormalPsychology
    ii. Accounting
    iii. AdvancedAlgorithms
    iv. Advanced ComputationalComplexity
    v. Advanced Computer Architecture
    vi. Advanced ComputerProgramming
    vii. Advanced Operating Systems
2. List the problems you experienced when you carried out a recent IT-related assignment. Try to put these problems into some order of magnitude. For each problem, consider whether there was some way in which the problem could have been reduced by better organization and planning byyourself.
3. Identify the main types of personnel employed in an information systems department. For each stage of a typical IS development project, list the types of personnel who are likely tobe involved.
4. A public library department is considering the implementation of a computer-based system to help administer book loans at libraries. Identify the stakeholders in such a project. What might be the objectives of such a project and how might the success of the project be measured in practical terms?

Recommended Books:
1. Computer Graphics, D.HearnAndP.Baker - Pearson Eduction - C Version2002
2. Computer Graphics, with OpenGL Hearn and Baker, Pearson Education India; 3rd edition(2013)
3. Computer Graphics, Sinha &Udai, - TMH ,McGraw Hill Education (14 August2007)
4. Computer Graphics: Principles and Practice , Addison-Wesley,2014
5. Computer Graphics using OpenGL, F. S. Hill Jr., 3rd Edition Pearson Education,2003.
6. Introduction to A.I and Expert Systems by DAN.W. Patterson – PHI,2007.
7. Artificial Intelligence-A Modern Approach**,** Russell &Norvig, LPE, Pearson Prentice Hall,2nd edition, 2005.
8. Artificial Intelligence by Rich & Knight Published by Tata McGraw-Hill Education Pvt. Ltd., 2008
9. Programming in PROLOG, W.F. Clocksin and Mellish, Narosa Publishing House, 3rdedition, 2001.
10. Prolog Programming for Artificial Intelligence, Ivan Bratko, Addison-Wesley,Pearson Education, 3rd edition,2000.

Learning Outcomes:
1. To understand implementation of 2D and 3DTransformation.
2. To capable of using OpenGL to create interactive computergraphics.
3. This Prolog practical offers you the opportunity to familiarizeyourself with the basic principles of the programming languageProlog.
4. Evaluate the role and place of Prolog in the area of Artificial Intelligence (AI), and in programming-language research morein general

SECCCSP610: Industrial Project

Course Work: 25
Industrial Visits and report writing, Preparation of entrepreneurship Proposal and Presentation.

Nature of Question Paper:

1. **ISE-I :** Marks =10: Unit 1and 2 : Multiple Choice questions : Online Examination: (1X10)
2. **ISE-II**: Marks =10: Unit 1,2 and3: Descriptive short questions(2X5)
3. **ESE**: Marks =50: Unit 1 to4:
   Define the following terms (5 X2=10)
   Attempt any two out of three (2X10=20)
   Attempt any four out of six(4X5=20)

   (ISE- Internal Semester Examination, ESE – End Semester Examination)