

**Rayat Shikshan Sanstha's
YASHAVANTRAO CHAVAN INSTITUTE OF SCIENCE, SATARA
(AN AUTONOMOUS COLLEGE)**

Bachelor of Science

Part - III

Computer Science (Optional)

Syllabus

TITLE: Computer Science

YEAR OF IMPLEMENTATION: The syllabus will be implemented from June, 2023 onwards.

DURATION: The course shall be full time.

PATTERN: Semester examination.

MEDIUM OF INSTRUCTION: English.

Structure of the course:

1. FIFTH SEMESTER—(NO.OF PAPERS – 4)

Sem-V

		Theory				Practical		
Sr. No	Subject Title	Paper No and Paper Code	Credits	No. of lectures per week	Total Credits		No. of lectures Per week	Credits
1	Computer	Paper-IX: BCST501	02	12	8	Practical Paper V & VI (BCSP 508,B CSP 509)	20	8
		Paper-X: BCST502	02					
		Paper-XI: BCST503	02					
		Paper-XII: BCST50X (Elective: BCST504/505 /506)	02					
		SECCCST507	01	01	01	SECCCSP 510	02	01
		AECCCST	02	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** :Internet of Things(IOT)
2. **BCST505**: Programming Essentials in Python
3. **BCST506**: Multimedia Computing

Practical Paper-V:BCSP508: Software Engineering 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

**2. SIXTH SEMESTER—(NO.OF PAPERS - 4)
Sem-VI**

Theory						Practical			
Sr. No.	Subject Title	Paper No and Paper Code	Credits	No. of lectures per week	Total Credits		No. of lectures Per week	Credits	
1	Computer	Paper-XIII: BCST601	02	12	8	Practical Paper VII & VIII (BCSP608, BCSP609)	20	8	
		Paper-XIV: BCST602	02						
		Paper-XV: BCST603	02						
		Paper-XVI: BCST60X (Elective: BCST604/605 /606)	02						
		SECCCST607	01	01	01		SECCCSP 610	02	01
		AECCCST	02	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 XII : BCST50X: Elective

Elective : BCST60X

1. **BCST604** : Fundamentals of Artificial Intelligence
2. **BCST605**: Web technology
3. **BCST606**: Software Project Management

Practical Paper-V:BCSP608: E-Commerce and Advanced C# Programming Lab

Practical Paper-VI: BCSP609: Computer Graphics & P-XVI Lab

SECCCST607: Entrepreneurship Development Program

SECCCSP610: Industrial Project

AECCCST:English

SECC: Skill Enhancement Compulsory Course

AECC: Ability Enhancement Compulsory Course

Structure and titles of the course of B.Sc. III course

Semester V

Code	Name of Course	Units
BCST501	Software Engineering (CREDITS:02; TOTAL HOURS: 45)	Unit I: Introduction Unit II: Software Process and requirements Unit III : Design Concepts and Principles Unit IV : Testing and Trends in Software Engineering
BCST502	Introduction to .NET using C# (CREDITS:02; TOTAL HOURS: 45)	Unit I: .NET Architecture Unit II: C# Basics Unit III: Inheritance and Polymorphism Unit IV: Windows base applications
BCST503	Advanced JAVA Programming (CREDITS:02; TOTAL HOURS: 45)	Unit I: Graphics Programming Using Swing Unit II: AWT and Event Handling Unit III : Servlet and JSP

		Unit IV : JDBC
Elective: BCST504	Internet of Things(IOT) (CREDITS:02; TOTAL HOURS: 45)	Unit I: Introduction to IoT Architecture Unit II: Embedded IoT devices Unit III : IoT Protocols Unit IV : IoT Applications and case study
Elective: BCST505	Programming Essentials in Python (CREDITS:02; TOTAL HOURS: 45)	Unit I: Overview of Programming Unit II: Datatypes and operators Unit III : Creating Python Programs and Structures Unit IV : Advanced Python
Elective: BCST506	Multimedia Computing (CREDITS:02; TOTAL HOURS: 45)	Unit I: Overview of multimedia computing Unit II: Visual and audio system Unit III : Data Representation And Analysis Unit IV : Animation
SECCCST507	Programming with SCILAB (CREDITS:01; TOTAL HOURS: 15)	Unit I: Introduction to Programming Unit II: Control structure Unit III : Graph Plots Unit IV : Arrays and string Functions

Semester VI

Code	Name of Course	Units
BCST601	E – Commerce (CREDITS:02; TOTAL HOURS: 45)	Unit I: An introduction to Electronic commerce Unit II: Internet Security Unit III : Electronic Data Exchange Unit IV : Planning for Electronic Commerce
BCST602	Advanced C# Programming (CREDITS:02; TOTAL HOURS: 45)	Unit I: Exception Handling and Threading Unit II: I/O and Streams Unit III: ASP.NET

		Unit IV: DBMS
BCST603	Computer Graphics (CREDITS:02; TOTAL HOURS: 45)	Unit I: Basic of Computer Graphics Unit II: Graphics Primitive Unit III : Two-Dimensional and Three-Dimensional Transformations Unit IV : Clipping Techniques and OpenGL
Elective: BCST604	Fundamentals of Artificial Intelligence (CREDITS:02; TOTAL HOURS: 45)	Unit I: Introduction Unit II: Problem Solving and Searching Techniques Unit III : Knowledge Representation Unit IV : Programming in Logic (PROLOG)
Elective: BCST605	Web Technology (CREDITS:02; TOTAL HOURS: 45)	Unit I: Web Essentials Unit II: Introduction to Client-Side Programming Unit III : Server-Side Programming Unit IV : Representing Web Data
Elective: BCST606	Software Project Management (CREDITS:02; TOTAL HOURS: 45)	Unit I: Introduction to Project Management and Components Unit II: Scope,Time and Cost Management Unit III : Quality and Risk Management Unit IV : Software Metrics and Quality Standards
SECCCST 607	Entrepreneurship Development Program (CREDITS:01; TOTAL HOURS: 20)	Unit I: Entrepreneurship, Creativity & Opportunities Unit II: Information and Support Systems Unit III : Business Finance & Accounts Unit IV : Enterprise Management and Modern Trends

Semester – V

Course – IX :BCST501: Software Engineering

Course Objectives: Student will able

1. To learn and understand the Concepts of Software Engineering .
2. To Learn and understand Software Development Life Cycle.
3. To apply the project management and analysis principles to software project development.
4. To apply the design & testing principles to software project development.

Credits (Total Credits 2)	SEMESTER-V BCST501	No. of hours per unit/ credits
UNIT - I	Introduction	(10)
	Software- What is software? Types of software, Characteristics of Software, Attributes of good software, Software Engineering -What is software engineering?,SDLC, Software engineering costs, What are the key challenges facing software engineering? Systems engineering & software Engineering	
UNIT - II	Software Development Process Models	(10)
	What is a software process? What is a software process model? The waterfall model Evolutionary development, Component-Based Software Engineering (CBSE) ,Process Iteration- Incremental delivery ,Spiral development, Rapid software development -Agile methods ,Extreme programming ,Rapid application development (RAD), Software prototyping Computer Aided Software Engineering (CASE) -Overview of CASE approach , Classification of CASE tools.	
UNIT - III	Software Requirement Analysis and Specification	(12)
	System and software requirements, Types of software requirements- Functional and non-functional requirements, Domain requirements ,User requirements ,Elicitation and analysis of	

	requirements- Overview of techniques, Viewpoints, Interviewing Scenarios ,Use-cases, Process modeling with physical and logical DFDs, Entity Relationship Diagram Data Dictionary,Requirement validation, Requirement specification Software ,requirement Specification (SRS) Structure and contents SRS format Feasibility	
UNIT - IV	Software Testing and Quality Assurance	(13)
	Software Testing and Quality Assurance ,Verification and validation Techniques of testing, Black-box and White-box testing ,Inspections, Levels of testing -Unit testing ,Integration Testing, Interface testing ,System testing, Alpha and beta testing ,Regression testing, Design of test cases ,Quality management activities, Product and process quality, Standards- ISO9000 ,Capability Maturity Model (CMM)	

Course outcomes:Students should be able to

1. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
2. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software .
3. Translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
4. Explain the software engineering principles and techniques that are used in developing quality software products.

References:

1. Roger S.Pressman, Software engineering- A practitioner’s Approach, McGraw-Hill
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and WitoldPedryez, “Software Engineering – An Engineering Approach”, John Wiley and Sons, New Delhi, 2000.
5. Fundamentals of Software Engineering by Rajib Mall.

Course X : BCST502: Introduction to .NET using C#

Course Objectives: Student will able

1. To Students will gain the ability to implement the algorithms in C#.net, VB.net and ASP.net.
2. To provide the knowledge of Dot Net Frameworks along with C#.
3. To analyze object-oriented paradigm in the C # programming language.
4. To understand different windows based applications using standard controls and components.

Credits (Total Credits 2)	SEMESTER-V BCST502	No. of hours per unit/ credits
UNIT - I	.NET Architecture	12
	Block diagram of .net framework, The Common Language Runtime, Advantages of Managed Code, A Closer Look at Intermediate Language & Assemblies, 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, ClassMembers, DataMembers, 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	Inheritance and Polymorphism	11
	Introduction-Types of Inheritance, Implementation Inheritance, Abstract Classes and Functions Sealed Classes and Functions, Constructors in Derived Classes, Interfaces, Defining and Implementing Interfaces, Derived Interfaces, Polymorphism, Method overloading, Operator overloading	
UNIT - IV	Windows base application	10
	Creating a Windows Form Application, Standard Controls and Components, Properties and Events of the controls, Forms, FormClass, Multiple Document Interface (MDI), Custom Controls (user Controls)	

Course outcomes: Student should be able to

1. Use the features of Dot Net Framework along with the features of C#.
2. Develop correct, well-documented programs using the C# programming language.
3. Learn to develop object-oriented programs using C# classes and objects.
4. Learn to use Windows Forms and WPF to create GUI-based programs.

References-

1. Professional C# – Wrox Publication by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
2. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press © 2001, 403 pages Beginning ASP.NET 3.5, Wrox Publication.
3. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly.
4. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress.
5. Database Programming with C#, By Carsten Thomsen, Apress

Course XI : BCST503: Advanced JAVA Programming

Course Objectives: Student will able

1. To obtain the basic knowledge of object oriented programming, concepts of basic JAVA ,advanced JAVA and Server side scripting(JSP).
2. To develop distributed business applications, develop web pages using advanced server-side programming through servlets and Java server pages.
3. To design and develop error-free, well-documented Java programs.
4. To Learn how to write, test, and debug advanced-level Object-Oriented programs using Java.

Credits (Total Credits 2)	SEMESTER-V BCST503	No. of hours per unit/ credits
UNIT - I	Graphics Programming Using Swing	12
	Working with 2D Basic Shapes, Using Color, Using Font, Displaying Images, Swing-1 Concept, MVC architecture,2 Component of swing: JFrame, JComponent, JLabel, JTextfields, JCheckbox, JPanel, JRadiobuttons, JTabbedPane, JButton, JTree, JTable, Jmenu, Difference between AWT and Swing.	
UNIT - II	AWT and Event Handling	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	Servlet and JSP	10
	Introduction of servlet, Life cycle of servlet, Session, cookies,servlet jdbc connection. Components of JSP: Directives, Tags, Scripting elements,simple application using JSP.	

UNIT - IV	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.	

Course outcomes: Student should be able

1. To design a graphical user interface (GUI) with Java Swing API.
2. To use event handling in Java applications and to draw various shapes using AWT Components.
3. To develop JSP applications using JSP Tags, JSP Scriptlets and JSP Application Models.
4. To evaluate solid Java applications using Java Database Connectivity (JDBC) to interact with relational databases and how to do fundamental database activities utilizing JDBC (Java Database Connectivity) API.

References-

1. Head First Ejb, Kathy Sierra & Bert Bates, O'REILLY publications, October 2003
2. Java server programming (J2EE 1.4) Black Book, Kogent Solutions Inc., Dreamtech Press , 2010
3. Head First Servlets & Jsp", Kathy Sierra & Bert Bates, O'REILLY publications, Kathy Sierra & Bert Bates, January 2011
4. Java 2(Complete Reference) fourth Edition, P.Naughton and H.Schildt, Mcgraw-Hill Osborne Media ,2000

Elective:

Course XII : BCST504: Internet of Things(IOT)

Course Objectives: Student will able

1. To learn the basics of Introduction to IoT.
2. To understand the state of Art -IoT Architecture & Market perspective model.
3. To understand the Android OS architecture and Understand the application development lifecycle.
4. To study Android's APIs for data storage, retrieval, user preferences, files and content providers.

Credits (Total Credits 2)	SEMESTER-V BCST504	No. of hours per unit/ credits
UNIT - I	Introduction to IoT Architecture	(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 multi tier WoT architecture, WoT portals and Business Intelligence.M2M to IoT: M2M Communication, Trends in Information and Communication Technology, Implications for IoT, IoT Architecture:Building architecture, Main design principles and needed capabilities, An IoT architectural overview.IoT Reference Model:IoT domain model.	
UNIT - II	Embedded IoT devices	(14)
	Embedded IoT devices: Sensors and actuators for IoT applications, IoT components and implementation, Programming of NodeMCU and Raspberry PI, Implementation of IoT with Edge devices, Reading sensor data and transmit to cloud, Controlling devices through cloud using mobile application and web application	

UNIT - III	IoT Protocols	(10)
	Link layer protocols, Network/internet layer protocols, Transport layer protocols, Application layer protocols: Hypertext transfer protocol (HTTP), Systematic HTTP access methodology, Web Socket, Constrained application protocol CoAP), Message Queue Telemetry Transport Protocol (MQTT), XMPP, DDS, AMQP	
UNIT - IV	IoT Applications and case study	(10)
	Broad categories of IoT applications: Consumer IoT, Commercial IoT, Industrial IoT, Infrastructure IoT, Military Things (IoMT),IoT Case studies: Home automation with IoT, River water pollution monitoring, Smart city street light control and monitoring, Health care monitoring, Voice Apps on IoT device	

Course outcomes-Students should be able to

1. Learn IoT architecture.
2. Understand program Embedded IoT devices.
3. Use IoT protocol to upload sensor data and to control devices.
4. Design IoT application.

References

1. Rahul Dubey, “An Introduction to Internet of Things: Connecting Devices, Edge Gateway, and Cloud with Applications”, Cengage India Publication
2. Raj Kamal, “Internet of Things: Architecture and Design Principles, Mc Graw Hill Education
3. Vijay Madiseti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”, , Paperback, 2015.
4. A. McEwen, H. Cassimally, “Designing the Internet of Things”, Wiley, 2013.
5. Yashwant Kanetkar, “21 Internet of Things Experiments”, Kindle edition
6. Adeel Javed, “Building Arduino projects for Internet of Things”, Apress publication
7. Donald Noris, “The Internet of Things: Do it yourself Projects with Arduino, Raspberry PI and BeagleBone Black” Mc Graw Hill Publication

Elective: Course XII : BCST505: Programming Essentials in python

Course Objectives: Student will able

1. To understand programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python.
4. To inculcate Problem solving and programming capability.

Credits (Total Credits 2)	SEMESTER-V BCST505	No. of hours per unit/ credits
UNIT - I	Overview of Programming	(10)
	Structure of a Python Program, Elements of Python, Hello world application, Interpreters, modules, and a more interesting program, Variables, Names and Assignment, Types Input and Output Statements.	
UNIT - II	Datatypes and operators	(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 Programs and Structures	(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	Advanced Python	(10)
	Objects and Classes, Inheritance, Regular Expressions, Event Driven Programming, GUI Programming.	

Course outcomes-Students should be able to

1. Understand why Python is a useful scripting language for developers.
2. Learn how to design and program Python applications.
3. Explain basic principles of Python programming language
4. Implementing database and GUI applications.

References

1. Python: The Complete Reference by Martin C. Brown, McGraw Hill Education; Fourth edition (20 March 2018)
2. T. Budd, Exploring Python, TMH, 1st Ed, 2011
3. Python for Informatics: Exploring Information, Charles Severance
4. Learning Python, Fourth Edition, Mark Lutz, O'Reilly publication
5. Introduction to Python for Computational Science and Engineering (A beginner's guide), Hans Fangohr
6. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India

Elective: Course XII : BCST506:Multimedia Computing

Course Objectives: Student will able

1. To understand how still images, sound, and video can be digitized on the computer.
2. To create their own multimedia programs using software tools.
3. To formulate a working definition of interactive multimedia.
4. To study competence in using the authoring multimedia program.

Credits (Total Credits 2)	SEMESTER-V BCST506	No. of hours per unit/credits
UNIT - I	Overview of multimedia computing	(8)
	Definitions, terms, terminologies, characteristics and requirements of different media; components of multimedia systems.	
UNIT - II	Visual and audio system	(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 Representation And Analysis	(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	

Course outcomes-Students should be able to

1. Understand the characteristics of different media, multimedia data,data formats.
2. Learn the characteristics of a human's visual system; understand the characteristics of a human's audio system.
3. Analyze different compression principles and understand different compression techniques.
4. Design and develop multimedia systems according to the requirements of multimedia applications.

References:

1. Fundamentals of Multimedia, Z.N. Li and M.S. Drew, Prentice Hall, 2nd edition 2003
2. Readings in Multimedia Computing and Networking. K. Jeffay and H. Zhang , Morgan Kaufmann publisher ,1st edition 2001.
3. Principles of Multimedia, RanjanParekh, Tata McGraw-Hill Education publishier, 2 nd edition 2012 .
4. Multimedia Computing, Communications &Applications, Ralf Steinmetz, KlaraNahrstedtm, Pearson Education,1 stedition, 2014.

Course XII : SECCCST507:Programming with SCILAB

Course Objectives: Student will able

1. To analyze knowledge of physics and mathematics is transformed into a computer program.
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 using Scilab.
4. To understand advanced data structures, 2-D and 3-D graphical functions.

Credits (Total Credits 2)	SEMESTER-V SECCCST507	No. of hours per unit/credits
UNIT - I	Introduction to Programming	(5)
	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	Control structure	(5)
	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	Graph Plots:	(5)
	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 and string Functions	(5)
	Definition, declaration, initialization (static and run-time or dynamic) and arrays, matrices and strings, Accessing of strings, array and matrix elements and relevant operations, Comparison of built-in, library and user-defined functions.	

Course outcomes-Students should be able to

1. Understand the main features of the SCILAB program development environment to enable their usage in higher learning.
2. Implement simple mathematical functions/equations in a numerical computing environment such as SCILAB.
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 verify it under simulation environment using SCILAB tools.

References:

1. M.Affouf, SCILAB by Example , CreateSpace Independent Publishing Platform,2012
2. H. Ramchandran, A.S. Nair, SCILAB , S.Chand, 2011
3. MATLAB and its Applications in Engineering, RajkumarBansal, Pearson Publishers, ISBN-10: 8131716813, 2009.
4. SCILAB(a Free Software to Matlab),Er. HemaRamachandran and Dr. Achutsankar Nair, S. Chand Publishers, ISBN-10: 8121939704,2011

BCSP508:Lab Course V - Software Engineering and Introduction to .NET using C# Lab

Course Objectives: Student will able to

1. Broaden their knowledge of software engineering.
2. learn Software testing algorithms and programs.
3. provide the knowledge of Dot Net Frameworks along with C#
4. analyze object-oriented paradigm in the C # programming language.

Credits (Total Credit 04)	SEMESTER-V BCSP508: Lab Course V - Software Engineering and Introduction to .NET using C# Lab	No. of hours per unit/credits
	Part A: Software Engineering Lab	(60)
	<ol style="list-style-type: none"> 1. Preparing Software Requirements Specifications 2. Identifying Domain Classes from the Problem Statements 3. Modeling UML Class Diagrams and Sequence diagrams 4. Modeling UML Use Case Diagrams and Capturing Use Case Scenarios 5. E-R Modeling 6. State chart and Activity Modeling 7. Modeling Data Flow Diagrams 8. Estimation of Project Metrics 9. Estimation of Test Coverage Metrics and Structural Complexity 10. Designing Test Suites 	
	Part B: Introduction to .NET using C# Lab	
	Exercise: <ol style="list-style-type: none"> 1. Write a menu driven of a)Face value b)Armstrong c)Palindrome. 2. Write a program to overload method. 3. Write a program for static class and partial class. 4. Write a program for static property and indexer. 5. Write a program to implement inheritance and interface. 6. Write a program to overloading operator. 7. Write a program for delegate. 	

	8. Write a program creating files & directories & display the following attribute- 1]Name 2]Size 3]Get creation time by using windows application.	
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Course outcomes-Students should be able

1. To learn how to design and program Python applications.
2. To Implement database and GUI applications.
3. To use the features of Dot Net Framework along with the features of C#.
4. To develop correct, well-documented programs using the C# programming language .

Practical References-

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. Professional C# – Wrox Publication by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
4. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages Beginning ASP.NET 3.5, Wrox Publication
5. The unified modeling language user guide Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.

BCSP509: Lab Course VI- Advanced Java Programming and Internet of Things (IOT) / Programming Essentials in Python/ Multimedia Computing Lab

Course objectives: Student will able

1. To learn how to design a graphical user interface (GUI) with Java Swing and AWT.
2. To Develop applications using JSP and Servlet.
3. To Understand IoT architecture.
4. To create their own multimedia programs using software tools.

Credits (Total Credit 04)	SEMESTER-V BCSP509: Lab Course VI- Advanced Java Programming and Internet of Things(IOT) / Programming Essentials in Python / Multimedia Computing Lab	No. of hours per unit/credits (60)
	Part-A Advanced Java Programming Lab	
	<p>Exercise No.1 Programs on AWT, Swing and Database</p> <ol style="list-style-type: none"> 1. Program on Swing 2. Program on AWT 3. Program on Database Connection <p>Exercise No.2 Programs on JDBC, Jsp and Cookie & Session</p> <ol style="list-style-type: none"> 1. Program on cookie and Session 2. Program on Servlet JDBC 3. Simple application using JSP. <p>Exercise No.3 Programs on Servlet and SQL</p> <ol style="list-style-type: none"> 1. Write a java program to implement the SQL login ID commands using JDBC. 2. Write a program to demonstrate the concept of SQL exception, SQL warning. 3. Write a program to create a servlet to read the parameters <p>Exercise No.4 Programs on SQL commands and JDBC Connection</p> <ol style="list-style-type: none"> 1. Write a java program to implement the List. 2. Write a java program to implement the SQL commands using JDBC 	

	3. Write a program to illustrate the use of JDBC connection.	
	Part-B: Elective BCST504: Internet of Things(IOT)	
	<ol style="list-style-type: none"> 1. Getting started with NodeMCU, Arduino with ESP8266 and ESP32 in the Arduino IDE. 2. GPIO Interfacing and programming 3. Digital on/off sensor (PIR and IR) Interfacing programming 4. Analog sensor programming and uploading sensor data on cloud 5. Controlling devices remotely using Bluetooth link, WiFi link 6. Interfacing and programming of actuators, Controlling devices remotely using cloud 7. Web based device control 8. Development of Android applications suitable for IoT 9. Experiments on Agriculture IoT (Soil moisture, PH monitor) 10. IoT based home automation 	
	Part B: Elective BCST505: Programming Essentials in Python	
	<p>Section: I (Simple programs)</p> <ol style="list-style-type: none"> 1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon the user's choice. 2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of three subjects are to be input by the user. 3. Write a menu-driven program, using user-defined functions <ol style="list-style-type: none"> i. To find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user. ii. WAP to display the first n terms of Fibonacci series. 	

- iii. WAP to find factorial of the given number.
- iv. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
- v. WAP to calculate the sum and product of two compatible matrices.

Section: II (Visual Python):

1. All the programs should be written using user defined functions, wherever possible.
2. Write a menu-driven program to create mathematical 3D objects
 - I. curve
 - II. sphere
 - III. cone
 - IV. arrow
 - V. ring
 - VI. Cylinder.
3. WAP to read n integers and display them as a histogram.
4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as 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.

	<p>Elective BCST506: Multimedia Computing</p> <ol style="list-style-type: none"> 1. Create Rain Drops using Multimedia Tools 2. Create Logo using Multimedia Tools. 3. Create an advertisement banner in Multimedia Tools. 4. Create Marriage Invitation using Multimedia Tools. 5. Using Multimedia Tools - i. create a growing plant animation using key frames ii. Using Multimedia Tools create web site with rollover button. 6. Create an animation using shape tweening. 7. Create an animated web site. 8. Create a presentation for a college function. 	
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Course outcomes-Students should be able

1. To design and develop web applications to establish a JDBC connection between database and applications.
2. To learn to access database through Java programs, using Java Database Connectivity.
3. To learn, create dynamic web pages, using Servlets and JSP.
4. Build and deploy his/ her IOT application/Python applications or Multimedia applications.

Practical References-

1. Head First Servlets & Jsp”, Kathy Sierra & Bert Bates, O’REILLY publications, Kathy Sierra & Bert Bates, January 2011 5.
2. Java 2(Complete Reference) fourth Edition, P.Naughton and H.Schildt, Mcgraw-Hill Osborne Media ,2000
3. The Internet of Things: An Overview, Understanding the issues and Challenges of More Connected World, Karen Rose, Scott Eldridge, Lyman Chapin, Internet Society, 1 st edition, 2015.
4. Designing the Internet of Things, Adrian McEwen, Hakim Cassimally, Willy publication, 1 st Edition, 2014.
5. Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Springer Book Series Publisher, Springer International , 1 st edition, 2011

SECCCSP510: Lab Course - Programming with SCILAB lab

Course Objectives: Student will be able

1. To analyze knowledge of physics and mathematics is transformed into a computer program.
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 using Scilab.
4. To access advanced data structures, 2-D and 3-D graphical functions.

Credits (Total Credit 01)	Software Lab Based on Programming with SCILAB	No. of hours per unit/ credits (15)
	<ol style="list-style-type: none"> 1. Display your country name. 2. Compute the area and circumference of a circle given the radius. 3. Compute simple interest given the interest rate, principal and duration. 4. Solve- <ol style="list-style-type: none"> a) Factorial of a single digit number. b) Swap contents of two variables without using intermediate variables. c) Absolute value of a number. d) Largest of three numbers. e) Logarithm of a number. 5. $Y = \sin(\theta_1 + \theta_2) + \cos(\theta_1 - \theta_2)$ given θ_1 and θ_2 in degrees. 6. Average of the numbers in 3x4 matrix. 7. Plot discharging voltage across capacitor. 8. Analyze the program 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., $A=246$; $B=-90$; $C=A+B*(10/A) + 100$; <code>sprintf ('%f', C)</code>; in Matlab] Such analysis should be carried out for all the concepts covered in this course. 	

Course outcomes-Students should be able to

1. Understand the main features of the SCILAB program development environment to enable their usage in the higher learning.
2. Implement simple mathematical functions/equations in numerical computing environment such as SCILAB.
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 verify it under simulation environment using SCILAB tools.

References:

1. SCILAB by Example , M.Affouf, Create Space Independent Publishing Platform,2012
2. Introduction to Scilab: For Engineers and Scientists, by Sandeep Nagar,Apress; 1st ed. edition (13 December 2017)
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

SEMESTER- VI
Course – XIII :BCST601: E – Commerce

Course Objectives: Student will able

1. To understand the complexity of e-commerce and its many facts.
2. To explore how e-business and e-commerce fit together.
3. To recognize the benefits and limitations of e-commerce.
4. To identify the main barriers to the growth and development of e-commerce in organisations.

Credits (Total Credits 2)	SEMESTER-V BCST601	No. of hours per unit/credits
UNIT - I	An introduction to Electronic commerce	(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, Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A,B2B, B2C)	
UNIT - II	Internet Security	(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	Electronic Data Exchange	(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 for Electronic Commerce	(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.	

Course outcomes: Student should be able to

1. Gain a comprehensive understanding of the E-Commerce landscape, current and emerging business models, and the technology and infrastructure underpinnings of the business.
2. Develop an understanding on how the internet can help business grow .
3. Able to understand the importance of security, privacy, and ethical issues as they relate to E-Commerce.
4. Recognize the impact of Information and Communication technologies, especially of the Internet in business operations

References-

1. G.S.V.Murthy, E-Commerce Concepts, Models, Strategies- :- Himalaya Publishing House, 2011.
2. Kamlesh K Bajaj and DebjaniNag , E- Commerce , 2005.
3. Gray P. Schneider , Electronic commerce, International Student Edition, 2011
4. E-COMMERCE, FUNDAMENTALS AND APPLICATIONS, Wiely Student Edition, 2011

Course – XIV :BCST602: Advanced C# Programming

Course Objectives: Student will able

1. To Streamline data-centric applications with C# extended features and the Entity Framework
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 of controls.
4. To implement and deploy the website.

Credits (Total Credits 2)	SEMESTER-VI BCST5602	No. of hours per unit/credits
UNIT - I	Exception Handling and Threading	10
	Try, catch, throw, finally, Nested try, Custom exception, What is threading?, Applications with Multiple ,Threads, Thread Priorities, Synchronization	
UNIT - II	File I/O and Streams	12
	Working with Drives, Directories, and Files, The DriveInfoClass, 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.	
UNIT - III	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.	
UNIT - IV	Database Management with ADO.net	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.	

Course outcomes: Student should be able to

1. Understand the useful and advanced concepts in C# like multithreading, error handling, reflection etc.
2. Understand the new features that are unique to C# such as properties, indexers, delegates, events and namespaces.
3. Learn 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, HTML controls, validation controls, user control and data binding controls
4. Understand how ADO.NET is used in web development using ASP.NET and the concept of files and how database connection is established.

References-

1. Professional C# – Wrox Publication by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
2. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press © 2001, 403 pages Beginning ASP.NET 3.5, Wrox Publication
3. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly
4. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress

Course XV : BCST603: Computer Graphics

Course Objectives: Student will able

1. To understand the basics of various input and output computer graphics.
2. To make the student present the content graphically.
3. To Gain knowledge about graphics hardware and software.
4. To understand Various 2D and 3D objects transformation techniques

Credits (Total Credits 2)	SEMESTER-VI BCST603 Computer Graphics	No. of hours per unit/credits
UNIT - I	Basic of Computer Graphics	(12L)
	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 - II	Graphics Primitive	(10L)
	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 and Three-Dimensional Transformations	(13L)
	Introduction of transformations, Types: Transformations and Matrices, Transformation ,Conventions, Homogeneous Coordinates and Matrix Representation of 2D and 3D Transformations, Transformation, Transformation of Points	

UNIT - IV	Clipping Techniques and OpenGL	(10L)
	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	

Course outcomes-Students should be able

1. To understand the various computer graphics, graphics devices.
2. To understand the graphics programs and implementation, graphics functions and how to apply it.
3. To understand 2D and 3D viewing technologies, Various 2D and 3D objects transformation techniques.
4. To understand clipping techniques and drawing various shapes using it. To be able to learn OpenGL, its operations and programming using OpenGL.

References-

1. Computer Graphics, D.Hearn And P.Baker - Pearson Education - C Version
2. Computer Graphics, with OpenGL Hearn and Baker, - Pearson
3. Computer Graphics, Sinha &Udai, - TMH
4. Computer Graphics, Foley and van Dam - Person Education
5. F. S. Hill Jr., Computer Graphics using OpenGL, Pearson Education, 2003.

Course – XVI :BCST604: Fundamentals of Artificial Intelligence

Course Objectives: Student will able

1. To create appreciation and understanding of both the achievements of AI and the theory underlying those achievements.
2. To introduce the concepts of a Rational Intelligent Agent and the different types of Agents that can be designed to solve problems.
3. To review the different stages of development of the AI field from human-like behavior to Rational Agents.
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 game playing.

Credits (Total Credits 2)	SEMESTER-VI BCST604	No. of hours per unit/credits
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 and environment	
UNIT - II	Problem Solving and Searching Techniques	(12)
	Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A*, AO* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.	
UNIT - III	Knowledge Representation	(10)
	Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs.	

UNIT - IV	Programming in Logic (PROLOG)	(12)
	Introduction To Prolog: Syntax and Numeric Function, Basic List Manipulation, Functions In Prolog, Functions, Predicates and Conditional, Input, Output and Local Variables, Iteration and Recursion, Property Lists and Arrays.	

Course outcomes: Student should be able to

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

References-

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.

Course – XVI :BCST605: Web Technology

Course Objectives: Student will be able to

1. Understand client server architecture.
2. Study of web applications using java technologies
3. Gain the skills and project-based experience needed for entry into web application and development careers.
4. Learn different web related technologies.

Credits (Total Credits 2)	SEMESTER-VI BCST605	No. of hours per unit/credits
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 to Client-Side Programming	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, YUI Library	
UNIT - III	Server-Side Programming	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	Representing Web Data	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.	

Course outcomes: Student should be able to

1. Understand the fundamentals of web protocols.
2. Learn different web related technologies currently used.
3. Understand Studying data handling in web systems.
4. Analysing a wide range of web security vulnerabilities and issues.

References-

1. "Core Web Programming", Marty Hall, Larry Brown ,Pearson Education, 2nd Edition,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.

Course – XVI :BCST606: Software Project Management

Course Objectives: Student will be able to

1. Understand the fundamental principles of Software Project management.
2. Grasp good knowledge of responsibilities of project manager and how to handle these.
3. Understand the different methods and techniques used for project management.
4. Learn Software Metrics and Quality Standards.

Credits (Total Credits 2)	SEMESTER-V BCST606	No. of hours per unit/credits
UNIT - I	Introduction to Project Management and Components	(12)
	Introduction, 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, configuration management.	
UNIT - II	Scope, Time and Cost Management	(10)
	Scope Management-Strategic planning ,scope planning, definition ,verification and control.Time management- Activity planning, schedule development and control.Cost Management- Cost estimation and Control.	
UNIT - III	Quality and Risk 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 and Quality Standards	(12)
	Software Metrics- The scope of software metrics, software metrics data collection, analyzing software data, measuring size, structure, external attributes. Software Reliability- Measurement and prediction, resource measurement, productivity, teams and tools.Planning a measurement program. What is a 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	

Course outcomes: Student should be able to

1. Understand the fundamental principles of Software Project management & will also have a good knowledge of responsibilities of project manager and how to handle these.
2. Familiar with the different methods and techniques used for project management.
3. Evaluating good knowledge of the issues and challenges faced while doing Software project Management.
4. do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.

References-

1. Information Technology Project Management, 7th Edition Kathy Schwalbe,2012.
2. Software Metrics: A rigorous and Practical Approach by Norman E. Fenton and Shari Lawrence Pfleeger, International Thomson Computer Press, second edition, 1996.
3. Software Engineering: A Practitioner's Approach by Roger S. Pressman, TMH,6th edition 2005.
4. Practical Software Metrics for Project Management and Process Improvement Robert B. Grady, Prentice hall,4 th edition,2002.

Course – XVI :SECCCST607: Entrepreneurship Development

Course Objectives: Student will be able

1. To study the product design and development process
2. To Identification of opportunities for development
3. To learn the mechanism of finance and fundraising.
4. To understand the importance of marketing for better business opportunities.

Credits (Total Credits 1)	SEMESTER-VI BCST607	No. of hours per unit/credits
UNIT - I	Entrepreneurship, Creativity & Opportunities	5
	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 and Support Systems	5
	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	5
	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 benefit Analysis	
UNIT - IV	Enterprise Management and Modern Trends	5
	Enterprise Management- Essential roles of Entrepreneur in managing enterprise Product 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.	

Course outcomes: Student should be able to

1. Identify feasibility of product design and development
2. Get the idea about IP rights
3. Avail the financial and marketing skill
4. Prepare the proposal for a small scale industry.

References-

- 1.R. G. Kaduskar, V. B. Baru. Electronic Product Design. Second edition
Wiley India
2. Alpana Trehan. Entrepreneurship. Wiley India
3. G. N. Pandey. A complete guide to successful Entrepreneurship, Vika

BCSP608: Lab Course VII :(E-Commerce and Advanced C# Programming Lab)

Course objectives: Student will able

1. To design web pages using html.
2. To Develop familiarity with the JavaScript language.
3. To develop, implement and creating Applications with C#.
4. To develop, implement, and demonstrate Component Services, Threading, Remoting, Windows services, web

Credits (Total Credit 04)	SEMESTER-VI BCSP608:Lab Course VII E-Commerce and Advanced C# Programming Lab	No. of hours per unit/credits (60)
	Part-A E-Commerce Lab	
	<p>Exercise No.1 Programs on Html</p> <p>1. Write a HTML program to design a form which should allow you to enter your personal data. (Hint: make use of text field, password field, e-mail, lists, radio buttons, checkboxes, submit button)</p> <p>2. Write html code to generate the following output. • Coffee • Tea o Black Tea o Green Tea • Milk.</p> <p>3. Write a HTML code to generate following output</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <p>Name : <input style="width: 150px;" type="text"/></p> <p>Password <input style="width: 150px;" type="password"/></p> <p>Confirm Password <input style="width: 150px;" type="password"/></p> <p>City <input style="width: 100px;" type="text" value="Select City"/></p> <p>Gender <input type="radio"/> Male <input type="radio"/> Female</p> <p>Gmail <input style="width: 150px;" type="text"/></p> <p><input type="button" value="Submit"/></p> </div>	

	<p>Exercise No.2 CSS and JavaScript</p> <ol style="list-style-type: none"> 1. Design a CSS to create menu. 2. Design a webpage i.e. Bio data using CSS. 3. Write a program to create table and list using CSS. 4. Design a home page using javascript. <p>Exercise No.3 Programs on ASP and XML</p> <ol style="list-style-type: none"> 1 .Create a web page and display data from database. 2 . Create a simple XML document to display address book. 	
	<p>Part B: Advanced C# Programming Lab</p>	
	<ol style="list-style-type: none"> 1. Write a program for thread. 2. Write a program for Reading/Writing file by using byte stream class. 3. Write a program for copy one file to another file. 4. Simple application using web controls <ol style="list-style-type: none"> a) Finding factorial Value b) Money Conversion c) Quadratic Equation d) Temperature Conversion e) Login control 5. Calendar control <ol style="list-style-type: none"> a) Display messages in a calendar control b) Display vacation in a calendar control c) Selected day in a calendar control using style 6. Treeview control <ol style="list-style-type: none"> a) Treeview control and datalist b) Treeview operations 7. Use of Validation controls. 8. Simple Applications using database 	

	<p>a) Creating a Master page with Multi-form web applications.</p> <p>b) Create a web page for students and display their records using insert, delete, update, show operation.</p> <p>c) Report creation using crystal report.</p>	
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Course outcomes-Students should be able

1. To learn how to build real world creative and modern websites .
2. To Create ASP.Net applications using standard .net controls.
3. To understand and be able to explain Security in the .NET framework and Deployment in the .NET.
4. To develop Assemblies and Deployment in .NET, Mobile Application Development.

Practical References-

1. HTML & CSS: The Complete Reference, Fifth Edition (English, Paperback, Powell Thomas)
2. Mastering HTML, CSS & Javascript Web Publishing Paperback – 15 July 2016 by Laura Lemay (Author), Rafe Colburn (Author), Jennifer Kyrnin (Author)
3. Professional C# – Wrox Publication by Simon Robinson, Christain Nagel, Karli Watson, Jay Glynn, Morgan Skinner, Bill Evjen.
4. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages Beginning ASP.NET 3.5, Wrox Publication

BCSP609:Lab Course VIII :Computer Graphics and Fundamentals of Artificial Intelligence/ Web Technology /Software Project management Lab

Course objectives: Student will able

1. To learn how to use graphics commands and Functions in graphics and implementation 2D and 3D transformation
2. To Interpret PROLOG programs and to solve a variety of problems.
3. To develop a web application using java technologies.
4. To understand the fundamental principles of Software Project management.

Credits (Total Credit 04)	SEMESTER-VI BCSP609:Lab Course VIII: Computer Graphics and Fundamentals of Artificial Intelligence / Web Technology /Software Project management Lab	No. of hours per unit/ credits (60)
	Part-A Computer Graphics	
	<p>Exercise No.1 Programs on Graphics Basics 1. Introduction to various graphics commands. 2. Develop the DDA Line drawing algorithm .</p> <p>Exercise No.2 Programs on Operations and Functions 1. Draw basic graphics construction 2. Functions in Graphics.</p> <p>Exercise No.3 Programs on 2D and 3D Transformation 1. Translation, Rotation, and Scaling using Composite Transformation 2. Implement Standard Perspective Projection in 3-Dimensions.</p> <p>Exercise No.4 Programs on Clipping and OpenGL 1.To implement Point Clipping. 2. To implement OpenGL programming.</p>	
	Part B: Elective: BCST604: Fundamentals of Artificial Intelligence Lab	
	<ol style="list-style-type: none"> 1. Write a program to implement the Tic-Tac-Toe game problem. 2. Write a program to implement BFS (for 8 puzzle problems or Water Jug problems or any AI search problem). 3. Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem) 	

	<ol style="list-style-type: none"> 4. Write a prolog program to calculate the sum of two numbers. 5. Write a prolog program to find the maximum of two numbers. 6. Write a prolog program to calculate the factorial of a given number. 7. Write a Prolog program to implement append for two lists. 8. Write a Prolog program to count even and odd elements from list and count elements up to specific index in list. 	
	<p>Elective BCST605: Web Technology Lab</p> <ol style="list-style-type: none"> 1. Create a college website using HTML tags. 2. Create a calculator format using java script. 3. Add a simple script using Click event 4. Create Employee details using schemas. 5. Change the color of the old image to the new image and apply filter effects. 6. Draw an image in flash and work with different layers. 7. Creating a banner – Typography. 8. Animation with different layers with adding sounds 	
	<p>Elective BCST606: Software Project Management Lab</p> <ol style="list-style-type: none"> 1. For Internal Evaluation group-wise case study is compulsory. <ol style="list-style-type: none"> i. Abnormal Psychology ii. Accounting iii. Advanced Algorithms iv. Advanced Computational Complexity v. Advanced Computer Architecture vi. Advanced Computer Programming 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 by yourself. 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 to be involved. 	

	<p>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?</p>	
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Course outcomes-Students should be able

1. To understand basic graphics commands and learn various functions and basic operations.
2. To familiarize yourself with the basic principles of the programming language Prolog.
3. To learn different web related technologies currently used
4. To learn Software Metrics and Quality Standards.

Practical References-

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3. Computer Graphics using OpenGL, Pearson Education, 2003.
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7. Software Engineering: A Practioner's Approach by Roger S. Pressman, TMH, 6th edition 2005.
8. Introduction to Prolog Programming By Carl Townsend. 5.
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SECCCSP610: Industrial Project Course Work: 25

Industrial Visits and report writing, Preparation of entrepreneurship Proposal and Presentation.

Final Year Project work- 100 marks