Shri Sangameshwar Education Society's

Sangameshwar College, Solapur [Autonomous]

(Affiliated to Punyashlok Ahilyadevi Holkar Solapur University, Solapur)

Kannada Linguistic Minority Institute

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

STRUCTURE OF B.Sc ECS PROGRAMME UNDER CBCS PATTERN

Faculty of Science

B.Sc ECS THIRD YEAR

(To be implemented from A.Y. 2022-23)

Table-1

Semester	Course		Teaching Scheme/week		
			Hours	**Lectures**	**Credits**
V	AECC-D	Theory-V	3.2	4	2
	DSC-1E	Advanced Java -IX	4.8	6	4
		Practical-IV	4	5	2
	DSC-2E	Python Programming -X	4.8	6	4
		Practical-IV	4	5	2
	DSC-3E	Visual Programming- -XI	4.8	6	4
		Practical-IV	4	5	2
	DSE-4E	Data Communication and Networking -XII	4.8	6	4
	SEC-3- Theory Of Computer Science		2.4	3	2
	Total		**36.8**	**46**	**26**
VI	AECC-E	Theory-V	3.2	4	2
	DSC-1F	Android Application Development -XIII	4.8	6	4
		Practical-V	4	5	2
	DSC-2F	Internet Programming using ASP.Net- XIV	4.8	6	4
		Practical-V	4	5	2
	DSC-3F	React JS-XV	4.8	6	4
		Practical-V	4	5	2
	DSE-4F	System Security - XVI	4.8	6	4
	SEC-4- Compiler Construction		2.4	3	2
	Project		4.8	6	4
	Total		**41.6**	**52**	**30**
Total Semester V and VI			**78.4**	**98**	**56**

Table-2

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

DETAILED SYLLABUS
Of
COURSES OFFERED BY THE PROGRAMME

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

Course Title: Advanced Java -XII

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

Course Objectives:

The basic objective of this course is to develop web applications with the help of JDBC,JSP,Servlet technology ,JSTL libraries and Hibernate.

Unit No	Content	Hrs.
1	**IO programming and Networking** Introduction,Byte-oriented streams,Character – oriented streams,Object Stream and Serializable interface	7
2	**Networking** Basics,networking classes and interfaces ,using java.net package,doing TCP/IP and Datagram Programming.	5
3	**Servlets** What is Servlet? & Advantages of Servlet,Difference between CGI and Servlet Servlet Architecture, Life Cycle of Servlet, Types of Servlet:GenericServlet, HttpServlet,ServletConfig and ServletContext,difference between ServletConfig and ServletContext,Deployment Descriptors, Session Tracking, Using Cookies,HttpSession,URL-Rewriting, Hidden-Form Fields,Servlet Collaboration: RequestDispatcher ,sendRedirect()	12
4	**JSP** Introduction, Jsp LifeCycle, Jsp Implicit Objects & Scopes,Jsp Directives: page,include,taglib,Jsp Scripting Elements : declaratives, scriptlets,expressions,Jsp Actions: standard action,custom action Standard Actions:useBean tag,setProperty tag,getProperty tag,include tag ,forward tag,param tag,plug-in tag,params tag. fallback tag,directives tag, scriptlet tag,expression tag,Custom Actions	12
5	**JSP Standard Tag Library** JSTL Core Tags: General purpose Tag,Conditional tag, networking tag,JSTL SQL tags,JSTL formatting tags,Internationalization,Localization and Resource Bundle class	10
6	**Hibernate** Introduction to hibernate,Architecture of Hibernate,Hibernate annotation,Hibernate dialects,Hibernate web application,Inheritance Mapping: Table per Hierarchy(TPH), TPH using annotation, Table Per Concrete (TPC), TPC using annotation,Table Per Subclass (TPS),TPS using annotation.Hibernate Mapping: collection mapping, Mapping List,Mapping set,Mapping Bag, Mapping Map,One To One,One To Many, Many To Many, Many To one.	14

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

1	Acquire the knowledge of IO Programming
2	Implement the client server Program with the help of networking concept
3	Gain the knowledge of Servlet technology
4	Create dynamic HTML content with Servlets and JavaServer Pages, using the JSP Standard Tag Library (JSTL)

Suggested Readings:

1. Java the complete Reference by Herbert Schildt
2. Java Servlet Programming by Jasan Hunter
3. Beginning Java EE5 from Novice to Professionals by K. Makhar & C. Zelenk
4. Java Server Programming by Bayross & Shah
5. Thinking in java by Brucel
6. Java Server Programming Black book
7. Hibernate - Sharanam Shah & Vaishali Shah
8. "JDBC, Servlet and JSP Black Book"- Santosh Kumar K.
9. "Spring Persistence with Hibernate"- Paul Tepper Fisher, Brian D Murphy.

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

Course Title: Python Programming -X

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

Course Objectives:

The objectives of this course include Introduce the student to Python programming fundamentals, Expose students to application development and prototyping using Python and to teach an example of scripting and interpretative language and compare it with classical compiled programming languages.

Unit No	Content	Hrs.
1	**Introduction to Python:** Features/Characteristics of Python, Installation and Working with Python, Structure of a Python Program, Writing simple python program, Executing python program using command line window and IDLE graphics window, Python Virtual Machine, Identifiers and Keywords, Operators (Arithmetic operators, Relational operators, Logical or Boolean operators, Assignment Operators, Bit wise operators, Membership operators, Identity operators), Operator Precedence and Associativity. **Python Data Types** Python Variables, Data types in python, Built-in Datatypes, Bool datatype , Sequences in python, Sets, Literals in python, User Defined Data Types, Constants in python, Type conversion, Input and Output Statements, Command line arguments	10
2	**Control Statements** Conditional Statements: if, if-else, nested if –else, Looping: for, while, nested loops, Loop manipulation using pass, continue, break, assert and else suite **Strings, Collection Lists, Tuples and Dictionaries** Strings: Introduction to String, String Manipulation. Collection List: Introduction to List, Manipulating list. Tuples: Introduction to Tuples, Manipulating Tuples. Dictionaries: Concept of Dictionary, Techniques to create, update & delete dictionary items.	08
3	**Functions, Modules** Difference between a Function and a Method Functions: Defining a function, Calling a function, Advantages of functions, Types of functions, Function parameters: Formal parameters, Actual parameters, Anonymous functions, Global and Local variables, Modules: Importing module, Creating & exploring modules, Math module, Random module, Time module	08
4	**Object Oriented Programming** Features, Concept of Class & Objects, Constructor, Types of Variables, Namespaces, Types of Methods, Inner Classes, Constructors in Inheritance, Overriding SuperClass Constructors and Methods, Types of Inheritance, Abstract Classes and Interfaces, The Super() Method, Operator Overloading, Method Overloading, Method Overriding	12

	Multithreading Understanding threads,Difference between Process and A Thread,Creating Threads,Thread Synchronization,Deadlock of Threads,Avoiding Deadlock In a Program.	
5	**Regular Expressions** Introduction to Regular Expression, Advantages & Operations, Sequence characters in Regular Expression, Powerful pattern matching and searching, Password, email, url validation using regular expression, Pattern finding programs using regular expression Exception Handling: Errors in a Program, Exceptions, Exception handling, Types of Exceptions, User-defined Exceptions **Python File Operation** Types of File, Opening and Closing a File, Reading and writing to files, Manipulating directories	10
6	**GUI Programming** Introduction, Advantages of GUI, Introduction to GUI library, Root Window Working with Containers: Frame, Canvas Layout Management, Events and Bindings, Font, Colors, drawing on Canvas (line, oval, rectangle, etc.) Widgets: Label, Button, Checkbutton, Entry, Listbox,Message, Radio button, Text, Spinbox, Scrollbar, Menu etc. Writing Python Programs for GUI applications. **Working with Database** Steps for Database Connectivity, Working with MySQL Database: Inserting, Retrieving, Deleting and Updating the data working with Stored Procedure.	12

Co No	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Understand principles of Python
2	Develop the skills of object oriented programming
3	Solve problems and increase programming capability.
4	Develop the skill of designing Graphical user Interfaces in Python.
5	Acquire the ability to write database applications in Python

Suggested Readings:

1. Core python Programming- Dr.RNageswara Rao
2. Expert Python Programming,: Become a master in Python-By Michał Jaworski, Tare kZiade
3. MySQL for Python:Database Access Made Easy- A.Lukaszewski

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

Course Title: Visual Programming- -XI

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

Course Objectives:

This course introduces computer science and nonmajor students to fundamental programming skills using the VisualBasic Integrated Development environment. Students will learn program design, the fundamentals of event driven object oriented programming,and how to create menu driven programs and multiple form applications

Unit No	Content	Hrs.
1	**Introduction to Dot.Net Framework** Introduction to DOT NET, DOT NET class framework, Common Language Runtime,Overview, Elements of .NET application, Memory Management, Garbage Collector: FasterMemory allocation, Optimizations, Common Language Integration, Common type system,User and program Interface	08
2	**Introduction to C#** C# Language elements, Data types -Reference Type and Value Type, Boxing and Unboxing,Enum and Constant, Operators, Control Statements, working with Arrays and Strings,Parameter passing technique:Pass by value and by reference, out parameters, Variable length parameter.	08
3	**Object oriented Programming Concepts** Working with Indexer and Properties, Constructor and Destructor, working with "static"Members, Inheritance & Polymorphism - Types of Inheritance - Constructor in Inheritance -Interface Implementation - Operator and method Overloading and overriding - Static and Dynamic Binding and Virtual Methods, AbstractClass, sealed keyword.	12
4	**Exception Handling and I/O Programming** What is Exception, Rules for Handling Exception, Exception classes, Exception Handling keywords, Throwing exceptions, Stream Classes, System.IO and Base classes of Stream,Console I/O Stream,Working with File, Directory classes.	10
5	**Delegates,Events & Collection classes** Introduction to Delegation,Introduction of events, declaration of Events, Types of delegates, Anonymous Methods, ArrayList, HashTable,Stack,Queue, Writing custom generic & Non generic classes,working with Generic Collection Classes. **Multithreading Programming:** Thread, Creating a Thread, Thread Class, thread methods, Thread Life Cycle, Multithreading.	12
6	**Windows Forms and ADO.NET** Controls: Common control Group, Data, control Group, Dialog control Group, Containercontrol Group, Menus and Context Menus: Menu Strip, Toolbar Strip. SDI and MDIApplications, Evolution of ADO.NET, Connected and Disconnect Classes, EstablishingConnection with Database, Executing simple	10

	Insert, Update and Delete, Statements,DataReaderandDataAdapter, Data set and its Advantages, Stored Procedures, ODBC connectivity. **LINQ:** LINQ to SQL, LINQ queries, Query a collection of objects, Group query results, Perform joins	

Co No	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Adopt Microsoft .NET Framework and Object Oriented Approach.
2	Design and develop console and window based .NET application.
3	Create GUI components in C#.
4	Implement string manipulation, events handling, exception handling & database manipulation

Suggested Readings:

1. "ProgrammingC#"-JesseLiberty,O'ReillyPress.
2. "ProfessionalC#"-Robinsonetal,Wrox Press,2002.
3. "TheCompleteReference:C#"-HerbertSchildt,TataMcGrawHill.
4. "The Complete Reference:Ado.Net"-Jerke,Tata McGraw Hill.
5. "C#for programmer"-Delete-Pearson

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

Course Title: Data Communication and Networking -IX

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

Course Objectives:

The basic objectives of this course are to Study the basic taxonomy and terminology of the computer networking and describe the OSI and TCP/IP models, acquire knowledge of the application layers and presentation layers, and understand the session layer design issues.Read the fundamentals and basics of the physical layer, and apply them to real-time applications.

Unit No	Content	Hrs.
1	**Introduction to Data Communication & Networking :** Data Communication: Components, Data Flow, Protocols & Standards, Design Issues of Layers, Connection oriented and connection less services, Network models :- ISO-OSI reference model, TCP/IP reference model.	10
2	**Physical Layer :** Signals: Analog & Digital Signals, Period, Frequency, Phase, Amplitude, Bandwidth, Bit Rate, Bit Length, Fourier analysis. Transmission Impairment: Attenuation, Distortion, Noise, Transmission Media:-Guided Media-Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optic Cable, Unguided Media:- Wireless- Radio Waves, Microwaves, Infrared, Satellite Communication.	10
3	**Digital Transmission and Switching :** Digital Transmission: Manchester & Differential Manchester Coding, Pulse Code Modulation Modulation:- Amplitude Modulation, Frequency Modulation, Phase Modulation Transmission Mode: Parallel, Serial, Synchronous Transmission, Asynchronous Transmission. Multiplexing- Frequency Division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing. Switching- Circuit Switching, Message Switching, Packet Switching.	10
4	**Data Link Layer Functions and Protocols :** Data Link Control: Framing, Flow & Error Control, Protocols: Simplex, Stop and Wait, Stop and Wait ARQ, Go Back N ARQ, Selective repeat ARQ, 19 HDLC, Point to Point protocol. Multiple Access Protocol: ALOHA, CSMA, CSMA/CD, CSMA/CA Channelization, FDMA, TDMA, CDMA.	10
5	**Multiple Access Protocol and Network Layer :** Design Issues, EthernetLANS;ConnectingLANandBack - Backbone Networks-Repeaters, Hubs, Switches, Bridges, Router and Gateways, Networks\Layer Functions and Protocols, Routing,RoutingAlgorithms,NetworkLayer Protocol Internet-IP Protocol,Internet ControlProtocols.	08
6	**Transport,Session,Presentation andApplicationLayerProtocol** Transport Services- Error and Flow Control, Connection Establishment and ConnectionRelease, Flow Control & Buffering, TCP/IP protocol suite, Concept of-TCP, UDP, IP, FTP,DNS,Telnet, SMTP, POP, HTTP, WWW, ARP,RARP.	12

Co No	Expected Course Outcomes *On completion of this course, the students will be able to:*
1	CO1.Know the basic concepts of data communications and networking.

2	CO2.Identify network layered models, the Open System Interconnect (OSI) and the Internet Model using TCP/IP protocols.
3	CO3.Explain how noise, attenuation, and distortion affect signal transport, encoding methods of analog and digital data digital transmission. Flow and Congestion control.
4	CO4.Identify the use of LAN components like Bridges, Switches, Routers etc. and the backbone networks.
5	CO5.Know the basics of network configuration and maintenance.

Suggested Readings:

1. B.A.Forouzan:Data Communications and Networking, Fourth edition, THM Publishing Company Ltd2007..
2. S.Tanenbaum:Computer Networks, Fourth Edition,PHIPvt. Ltd2002

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

Course Title: Theory Of Computer Science

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

Course Objectives:

The basic objective of this course is to introduce the basic methods and conclusions of the Theory of Computation. At the end of the course, students learn to apply these methods to problems from different fields and be guided by the results in searching for computational solutions to the problems.

Unit No	Content	Hrs.
1	**Preliminaries** Basic Definitions, Sets, Various ways of describing a Set, Subsets,operations on Sets, Infinite Sets Relations, Properties of relations, Equivalence of relations.	6
2	**Finite Automata** Introduction, Deterministic Finite Automata, Non Deterministic Finite Automata, The Equivalence of DFAs and NFAs, Finite Automata with ε Moves, Equivalence of NFA with ε Transitions and NFA without Transitions, Finite Automata with output, Moore Machine, Melay Machine Equivalence of Moore and Melay Machine.	15
3	**Regular Expression and Properties of Regular Sets** Regular Expression Operations on set of strings, Regular Expression, Regular Sets, Equivalence of finite automata and regular expression Properties of Regular Sets Closure properties, The pumping lemma of regular sets, Application of pumping lemma.	12
4	**Regular and Context Free Grammars** Context Free Grammars (CFG) Derivation and Language generated by grammar, Derivation Trees, Ambiguity of CFG, Simplification of CFG, Normal forms of CFG Regular Grammars Equivalence of regular grammars and finite automata Closure properties of CFG.	13
5	**Pushdown Automata** Introduction, Definitions, Equivalence of acceptance by final state and empty stack, Definition of DPDA and NPDA their correlation and examples of NPDA, CFG to PDA: Method and example, Closure properties of Regular language, Application of PDA	10
6	**Turing Machine** Turing Machine model and definition of TM, Language accepted by TM, Design of TM and examples.	6

Co No	**Expected Course Outcomes** *On completion of this course, the students should be able to:*
1	Acknowledge the formal definitions of machine models.
2	Design Finite machines for a given regular language..
3	Analyze a given FiniteAutomata machine and find out its language.
4	Design pushdown automata machine for given Context Free languages.
5	Design Turing machine for given any computational problem.

Suggested Readings:

1. J.P. Hopcroft, Rajeev Motwani, J.D. Ullman, Introduction to Automata Theory, Languages and Computation, II Edition, Pearson Education, 2001
2. John Martin, Introduction to Languages and Theory of Computation, Tata McGrawHill, 2003.
3. Daniel I.A., Cohen, Introduction to Computer Theory, 2 nd Edition, John Wiley and Sons, Inc, 2000.

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

Course Title: Android Application Development-XV

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

Course Objectives:

Course objective is to introduce fundamental concepts in Android programming using the Android SDK. Students will learn activities, intents, designing user interfaces using views, data persistence and content providers as well as developing android services.

Unit No	Content	Hrs.
1	**Introduction to Android** What is Android? ,Setting up development environment,Dalvik Virtual Machine & .apk file extension,Fundamentals:Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications Components for communication -Intents & Intent Filters o Android API levels (versions & version names)	10
2	**Application Structure** AndroidManifest.xm,Launching emulator uses-permission & uses-sdk,Resources & R.java o Assets,Layouts & Drawable Resources,Activities and Activity lifecycle,First sample Application	10
3	**Basic UI design** Using Basic Views :TextView , Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, and RadioGroup Views , ProgressBar View, AutoCompleteTextView View . Using Picker Views : TimePicker View , DatePicker View . Using List Views to Display Long Lists : ListView View , Using the Spinner View , Fragments .	10
4	**Menu** Option menu, Context menu ,Sub menu ,menu from xml ,menu via code **Activity and Intents** Activity Life Cycle,Explicit Intents,Implicit intents	10
5	**Styles & Themes** styles.xml, drawable resources for shapes, gradients (selectors) ,style attribute in layout file, Applying themes via code and manifest file	10
6	**Content Providers** Introduction to SQLite , SQLiteOpenHelper and SQLiteDatabase,Creating , opening and closing database , Working with cursors, Insert, Update, Delete , Building and executing queries,Reading and updating Contacts.	10

Co No	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Demonstrate an understanding of the fundamentals of how Android systems work.
2	Demonstrate their skills in utilizing Android software development tools.
3	Students can design and develop user interfaces for the Android platform.
4	Students are able to apply style and themes in android apps
5	Students are able to use SQLite Database in Android

Suggested Readings:

1. Beginning Android4 Application Development, By Wei-Meng Lee WILEY India Edition WROX Publication
2. Professional Android 4 Application Development, By Reto Meier WROX Publication
3. The official site for Android developers - https://developer.android.com

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

Course Title: Internet Programming using ASP.Net - XIV

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

Course Objectives:

The main objective of this course is to provide the knowledge of Dot Net Frameworks along with ASP.NET web forms and SOAP web services. Student can able to design web form using various server controls and also student can able to implement AJAX in a web pages..

Unit No	Content	Hrs.
1	**Introduction of Asp.Net:** Evaluation of Asp.Net, Fundamentals of ASP.NET, Understanding architecture ASP.NET, Compilation Technique of ASP.Net, Application Location, Web Page and Web Site life cycle, ASP.Net Page Structure, Page Directives, Self-page and Cross page posting, Postback and ViewState concepts, Application Folders	10
2	**Web Server Control:** Creating ASP.NET Pages – Web Forms, Working with web controls – Standard, control group, Rich Controls, Different type of List controls, FileUpload, AdRotator, MultiView, Calendar, Create Web User Control	10
3	**Validation controls:** Introduction of validation, Types of validation, Validation Controls, Validation Groups **Master Pages and Themes:** Need of Master Pages, Basics of master pages, Creating Master and Content pages, Programmatically assign master pages, Nested Master pages, Event ordering of master pages, Basic Themes and Skins, Creating and Using Themes, Defining multiple skins, Programmatically working with themes. **Site Navigation:** Site Navigation technique, SiteMapPath, TreeView and Menu Control, Nesting sitemap file, Attach XML file to treeview and menu	10
4	**State Management:** Introduction of state management, technique, Types of State Management technique-Client side and server side State Management.	10
5	**AJAX:** What is AJAX and need for AJAX, Client side and server side AJAX, Implementing AJAX with JQuery, Using ASP.NET Ajax Control toolkit, ScriptManager, ScriptMangerProxy, Updatepanel, UpdateProgress, Timer,Understanding Partial Page Updates,RoundedCorners Extender, Editor, Collapsible Panel, Modal Popup, Confirm Button, Calendar Extender, Filtered TextBox, Password Strength, Rating, Slider, TextBox Watermark, Drop Shadow **Web Services:** What is Web Service? Understanding SOAP, WSDL, Proxy etc. Creating Web services, How to consume web services, to build a WebService application and Client.	10
6	**ADO.NET**: Accessing Data with ADO.NET, Using Data Sets on Web Forms, Processing Transactions, Working with DML commands, **Entity Framework**: Entity Framework overview, Modeling and Mapping, Querying a Model, Working with Objects	10

Co No	Expected Course Outcomes *On completion of this course, the students will be able to:*
1	Design a web page with various controls.

2	Perform validation with validation controls.
3	Implement ADO.NET to access data in a web application.
4	Configure and deploy Web Application

Suggested Readings:

1. "Professional ASP.Net"-Evjen, Sivkumar, Wrox Press.
2. "The Complete Reference: Asp.Net"-MacDonald, Tata McGraw Hill.
3. ASP.NET 4.5, Black Book- Kogent Learning Solutions Inc.

Course Title: React JS- XVI

Course Code:DSE-4F **Total Hours 60** **Course Credits 4**

Course Objectives:

The basic objective of this course is to learn front end development with react js using class and functional components. Students will learn how to use hooks with functional components.

Unit No	Content	Hrs.
1	**Introduction to React JS:** Introduction, React versions, Features, Benefits, Applications, React elements, JSX, React component, React.createElement, ReactDOM.render, Architecture of the React Application, SPA **JavaScript for React:** var, let and const, Arrow function, Control Statements, Loops and iteration, Classes, Properties and Methods, Spread and Rest Operators **React Basics:** Folder Structure, NPM, JSX, Class Components, Functional Components, Applying CSS, Fragments	10
2	**Working With State:** state and it significance, Read state and set state, Passing Data Viva "props", Validating props using propTypes, defaultProps, Destructuring props and state Events: Handling Events, Binding Event Handlers, Methods as Props, **Rendering lists:** Using react key prop, map function, Conditional Rendering, Index as Key Anti- Pattern	10
3	**Component Lifecycle and Error Handling:** Understand the lifecycle methods, Component Mounting, Component Updating, Handle errors using error boundaries, Higher Order Components **Context:** Introduction, uses, Create Context, Context.Provider, Context.Consumer, Reading context in class	10
4	**Working with form:** Controlled components, Uncontrolled components, Handling Multiple Inputs in Controlled Component, Handling HTML events of HTML controls, Validations **NPM Packages:** toastr, react-step-wizard, react-select, react-table, react-bootstrap, Modal, tooltip, Credit Cards, Date Picker, Video Player, axios	10
5	**Code-Splitting:** Need of code splitting, React.lazy, Suspense **Hooks:** Need of Hooks, Different types of hooks - useState, useEffect, useContext, useRef, useReducer, useCallback, useMemo, useNavigate, Rules of hooks, Building Your Own Hooks **Routing with react router:** Setting up react router, Understand routing, Configuring route with Route component, Making routes dynamic, Navigating to pages using Link and NavLink component, Redirect Component	10
6	**Redux:** Introduction, Redux principles, Install and setup redux, Creating actions, reducer and store **React Redux:** Presentational vs Container components, Understand high order component, Understanding mapStateToProps and mapDispatchtToProps usage	10

Co No	**Expected Course Outcomes** *On completion of this course, the students should be able to:*
1	Implement class components
2	Implement functional components

3	Implements react hooks
4	Implement higher order components
5	Implements react-redux in an application

Suggested Readings:

1. Beginning React, Andrea Chirarelli- Packt.
2. React, Lionel Lopez

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

Course Title: System Security -XIII

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

Course Objectives:

The Objective of the course is to learn cryptographic tools, security issues regarding user Authentication, and understand the various access control mechanisms.It will also help to understand various types of malicious softwares and Denial-of-Service attacks.

Unit No	Content	Hrs.
1	**Cryptographic Tools :** Confidentiality with Symmetric Encryption, Encryption Terminology, Message Authentication and Hash Functions,Public-Key Encryption, Digital Signatures and Key Management, Random and Pseudo Random Numbers.	06
2	**User Authentication :** Means of Authentication, Password-Based Authentication,Token-Based Authentication,Biometric Authentication,Remote User Authentication,Security Issues for User Authentication.	08
3	**Access Control :** Access Control Principles, Subjects, Objects, and Access Rights, Discretionary AccessControl, Example: UNIX File Access Control, Role - Based Access Control	12
4	**Database Security :** The Need for Database Security, security issues in Database Management Systems & Relational Databases,Database Access Control, Inference, Statistical Databases, Database Encryption, Cloud Security.	12
5	**Malicious Software :** Types of Malicious Software (Malware), Propagation– Infected Content–Viruses,Propagation–Vulnerability Exploit–Worms, Propagation–Social Engineering–SPAM Email,Trojans, Payload–System Corruption, Payload–Attack Agent–Zombie, Bots, Payload–Information Theft– Keyloggers, Phishing, Spyware, Payload–Stealthing– Backdoors,Rootkits,,Counter measures	10
6	**Denial-of-Service Attacks :** Denial-of-Service Attacks,Flooding Attacks, Distributed Denial-of-Service Attacks,Application-Based Bandwidth Attacks,Reflector and Amplifier Attacks,Defenses Against Denial-of-Service Attacks, Responding to aDenial-of-ServiceAttack.	12

Co No	**Expected Course Outcomes** *On completion of this course, the students will be able to:*
1	Develop an understanding of information assurance as practiced in computer operating systems,distributed systems,networks and representative applications.
2	Gain familiarity with prevalent network and distributed system attacks,defenses again stthem, and forensics to investigate the aftermath.

3	Develop Basic Understanding Of Cryptography,how it has evolved,and some key encryption techniques used today.
4	Develop An Understanding Of Security Policies(such as authentication,integrity and confidentiality)
5	implement such policies in the form of message exchanges.

Suggested Readings:

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

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

Course Title: Compiler Construction

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

Course Objectives:

The main objective of this course is to introduce the major concept areas of language translation and compiler design and to develop an awareness of the function and complexity of modern compilers. This course is a study of the theory and practice required for the design and implementation of interpreters and compilers for programming languages.

Unit No	Content	Hrs.
1	**Introduction to compiling** Compiler, self-compiler, cross compiler, phases of compiler, compiler construction tools	5
2	**Lexical Analysis** Role of lexical analyzer, input buffering, specification and recognition of tokens, finite automata implications, designing a lexical analyzer generator	5
3	**Syntax Analysis** Role of Parser, writing grammars for context free environments, top down parsing, recursive descent and predictive parsers (LL), Bottom-up parser, Operator precedence Parsing, LR,SLR	5
4	**Syntax Directed Translation** Syntax directed definitions, construction of syntax tree, bottom-up evaluation of S-attributed definitions, L-attributed definitions.	5
5	**Run time environments and Intermediate code generation** Source language issues, storage organization and location strategies, parameter passing,symbol table organization and generation, Intermediate languages, declarations, assignments statements and Boolean expressions, case statements, back patching	5
6	**Code generation and Code Optimization** Issues in design of a code generator and target machine, run time storage management ,basic blocks and flow graphs, issue of register allocation, assignment and basic blocks, code generation from DAG and the dynamic code generation algorithm. Source of optimization, peephole optimization and basic blocks loop in flow graphs, data flow analysis and equations, code improving transformation and aliases, data flow analysis and algorithms, symbolic debugging of optimized code.	5

Co No	**Expected Course Outcomes** *On completion of this course, the students should be able to:*
1	Introduce the major concepts in areas of language translation and compiler design.
2	Develop an awareness of the function and complexity of modern compilers.

3	Give students the knowledge and skills necessary to develop a language translator or compiler covering a broad range of engineering and scientific applications.
4	Learn context free grammars, compiler parsing techniques, construction of abstract syntax trees, symbol tables, and actual code generation.
5	Provide a thorough coverage of the basic issues in code optimization techniques.

Suggested Readings:

1. Compilers Principle, Techniques, Tools by Aho, Lam, Sethi and Ulman
2. Compiler Design by Wihelm, Mauer
3. Compiler Design : Theory, Tools and Examples by Bergamann

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

PRACTICAL LIST

Course Title:Advanced Java -XII

Sr.No	Practical List
1.	Develop java socket programming in which client sends a text and server receives it.
2.	Develop a program to demonstrate URL class.
3.	Develop a program to demonstrate InetAddress class.
4.	Develop a program to demonstrate use of Datagram Socket.
5.	Develop a Program to implement Byte-oriented stream and character-oriented stream.
6	Develop a Servlet program to check that life cycle methods are called by web container.
7	Develop a program to create a simple servlet for displaying welcome message.
8	Develop a program to create servlet for session management using cookies,Hidden Form Field
9	Develop a program to create a servlet for session management using URL Rewriting.
10	Develop a simple program to demonstrate the use of request dispatcher.
11	Develop a simple program to demonstrate the use of Send Redirect
12	Develop a program to implement JSTL core tag.
13	Develop a program for communication between HTML & JSP.
14	Develop a simple Hibernate programme.
15	Develop a HB with annotation.
16	Develop a HB Inheritance mapping.

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Course Title: Python Programming -X

Sr.No	Practical List
1.	Installing Python and setting up the Python environment.
2.	Develop a program to print strings, numbers and perform simple mathematical calculations.
3.	Develop a program to implement command line arguments.
4.	Develop a program to implement conditional statements -if, if-else, nested if.
5.	Develop a program to implement loops.
6.	Develop a program to manipulate strings like string copy, string concatenation, string comparison, string length, string reverse etc.
7.	Develop a program to show use of Lists and Tuples.
8.	Develop a program which uses dictionaries
9.	Develop a program to implement functions & Modules
10.	Develop a program to implement Package.
11.	Develop a program to implement Constructors.
12.	Develop a program to implement types of Inheritance and Interfaces.
13.	Develop a program to implement Method Overloading and Method Overriding.
14.	Develop a program to implement Operator Overloading.
15.	Develop a program to read and write contents in a file.
16.	Develop a program to demonstrate Exception handling
17.	Develop a program to demonstrate user defined exceptions.
18.	Develop a program to demonstrate the use of regular expressions
19.	Develop a program to draw different shapes
20.	Develop a Program to design Login Page

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Course Title: Visual Programming- -XI

Sr.No	Practical List
1.	Develop a program to check entered numbers even or odd.
2	Develop a program To get number and display sum of digits.
3	Develop a to check whether the entered year is a leap year or not.
4	Develop aTo Display Date In Various Formats.
5	Develop a programme to illustrate theUse ofAccess Specifiers.
6	Develop a Program To Create a Sealed Class.
7	Develop aProgram To Perform Boxing And Unboxing Operation.
8	Develop a Program to demonstrate multilevel inheritance.
9	Develop a Program to demonstrate single level inheritance.
10	Develop a program to demonstrate multilevel inheritance with virtual methods.
11	Develop a program get lower bound and upperbound an array.
12	Develop a Program To Demonstrate Jagged Array.
13	Develop a Program to demonstrate DivideByZero Exception.
14	Develop a Program To Create A File.
15	Develop a Program to Read theContents of File.
16	Develop a Program to implement BinaryReader.
17	Develop a Program to Design User Interface Using Windows Controls.
18	Develop a Program to design an MDI application.
19	Develop to demonstrate ADO.NET.
20	Develop a Program to demonstrate Insert,Update and Delete Statements.

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Course Title: Android Application Development-XV

Sr.No	Practical List
1	Develop a program to set background image using Drawable resource.
2	Develop a programme to display the factorial of a given number.
3	Develop a programme to display selected gender in toast using a radio button.
4	Develop a program to display selected hobbies using a checkbox.
5	Develop a program to display the name of the State using spinner control.
6	Develop a program to create a shape using drawable resource and display on screen.
7	Develop a program to implement various layouts in android.
8	Develop a program to implement implicit and explicit intent in android.
9	Develop a program to display student names using ListView Control.
10	Develop a program to implement putExtra and getExtra methods of Intent.
11	Develop a program to create a database(student) and suitable structure of register table and perform insertion operations.
12	Develop a program to display total rows present in the student table.
13	Develop a program to perform update and delete operations on the register table.
14	Develop a program to display all the records from a table into listview.
15	Develop a program to create a home page using various android components.
16	Develop a program to display student roll numbers in descending order from the stud table.
17	Develop a program to accept roll number and perform delete operation in the stud table.

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Course Title: Internet Programming using ASP.Net - XIV

Sr.No	Practical List
1	Develop a program to Design Web Page Which Demonstrates Command Name Property.
2	Develop a program toDesign Scientific Calculator.
3	Develop a program toDesign webpage for student admission which uses Label, TextBox, RadioButton, CheckBox, ListClass, ButtonClass, Calendar, Image, FileUpload etc. controls.
4	Develop a program toDesign web page which demonstrate which code is execute at first either server side or client side.
5	Develop a program toDesign webpage for Self Page Posting and Cross Page Posting.
6	Develop a program toDesign web page which demonstrates App_code using class library. Class library contains methods which check odd,even,prime,Armstrong,Palindrome, Strong and Magicnumber.
7	Develop a program toDesign webpage which demonstrates App_GlobalResources and App_LocalResources.
8	Develop a program to Develop a program toDesign webpage which demonstrates page lifecycle and website lifecycle.
9	Develop a program to Design a simple application which displays selected checkboxes and radio buttons.
10	Develop a program to Design a webpage for image mapping using static and dynamic methods.
11	Develop a program to Demonstrate all methods of insertion of items in list class.
12	Develop a program to Design web page which displays all system fonts, system colors, font size in ListClass. Display text message according to the selected font,size and color.
13	Develop a program to Display Current Year calendar. This calendar shows all holidays in Red Color Within Formation.
14	Develop a program to Display Selected Date In At Least 10 Different Formats.
15	Develop a program to Design XML file which shows College-Stream-Department-Staff-name-quali-exp-subject.
16	Develop a program to Develop a program to Display At Least 5 Different Advertisements.
17	Develop a program to Design a webpage for Wizard and MultiView control.
18	Develop a program to Design web page which uses all validation controls with validation group property.
19	Develop a program to Design Nested Master Pages Using Themes.
20	Develop a program to Design Web Page Which demonstrates working of DML Queries.

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Course Title: React JS- XVI

Sr.No	Practical List
1	Develop a javascript program which contains Arrow function, Control Statements & Loops
2	Develop a program to class component with state and props
3	Develop a program to class component with destructuring state and props
4	Develop a program to class component with conditional rendering
5	Develop a program to component to implement component's lifecycle methods
6	Develop a program to component to implement error boundary
7	Develop a program to class components to create and consume Context.
8	Develop a program to a student registration form with proper validations in a class component
9	Develop a program to Implement useState in a functional component
10	Develop a program to Create a signup form with proper validations in a functional component.
11	Develop a program to Create a functional component with react-select, react-step-wizard, react-datepicker, react-bootstrap and toastr
12	Develop a program to Implement useEffect in a functional component
13	Develop a program to Create a functional component to implement CRUD operations with axios.
14	Develop a program to Implement useContext in a functional components
15	Develop a program to Implement useRef in a functional component
16	Develop a program to Implements useNavigate with functional components
17	Develop a program to Implements useReducer
18	Develop a program to Implement Redux in an application

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