SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A++' Grade

Choice Based Credit System with Multiple Entries and Multiple Exit Option

(NEP-2020)

CHOICE BASED CREDIT SYSTEM

Syllabus for

B.Sc. COMPUTER SCIENCE (ENTIRE) Part – III

SEMESTER V AND VI

(Syllabus to be implemented from Academic Year 2024-25 Onwards)

SEMESTER – V

Sr. No.	Course Title	TEACHING SCHEME THEORY			TEACHING SCHEME PRACTICAL			EXAMINATION SCHEME THEORY University			Internal		EXAMINATION SCHEME PRACTICAL		
		No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	Hours	Max Marks	Min Marks	Max Marks	Min Marks	Hours	Max	Min
1	DSE-501	4	3.2	3	5	4	2	2	40	16	10	4	--	--	--
2	DSE-502	4	3.2	3	5	4	2	2	40	16	10	4	--	--	--
3	DSE-503	4	3.2	3	--	--	--	2	40	16	10	4	--	--	--
4	DSE-504 / DSE – 505	4	3.2	3	--	--	--	2	40	16	10	4	--	--	--
5	SEC- V	--	--	--	5	4	2	--	--	--	--	--	3	50	20
6	Project Work	--	--	--	5	4	2	--	--	--	--	--	--	--	--
7	AECC-E	4	3.2	2	--	--	--	2	40	16	10	4	--	--	--
	TOTAL	20	16	14	20	16	08		200		50	250	--	50	--

SEMESTER – VI

Sr. No.	Course Title	TEACHING SCHEME THEORY			TEACHING SCHEME PRACTICAL			EXAMINATION SCHEME THEORY University			Internal		EXAMINATION SCHEME PRACTICAL		
		No. of lectures	Hours	Credits	No. of lectures	Hours	Credits	Hours	Max Marks	Min Marks	Max Marks	Min Marks	Hours	Max	Min
1	DSE-601	4	3.2	3	5	4	2	2	40	16	10	4	As per BOS guideline	100	40
2	DSE-602	4	3.2	3	5	4	2	2	40	16	10	4		100	40
3	DSE-603	4	3.2	3	--	--	--	2	40	16	10	4			
4	DSE-604 / DSE – 605	4	3.2	3	--	--	--	2	40	16	10	4	--	--	--
5	SEC- VI	--	--	--	5	4	2	--	--	--	--	--	3	50	20
6	Project Work	--	--	--	5	4	2	--	--	--	--	--	--	100 (PW)	40
7	AECC-F	4	3.2	2	--	--	--	2	40	16	10	4	--	--	--
	TOTAL	20	16	14	20	16	08		200		50	250		50	
	TOTAL	40	32	28	40	32	16	Theory					Practical		
							44	250 + 250 = 500					50 + 50 + 100 + 100 + 100 = 400		

Student contact hours per week: **32 Hours (Min)**   Total Marks for B.Sc.-III (Including English.): **900 (Theory: 500 Marks & Practical: 400 Marks)**

Theory and Practical Lectures: **48 Min. Each**   Total Credits for B.Sc.-III (Semester V & VI):   **44**

CC- Core Course,   DSE: Discipline Specific Elective Course,   SEC: Skill Enhancement Course,

AECC- Ability Enhancement Compulsory Course (E & F): English for communication.

- Separate passing for each theory paper of 50 marks. Minimum 20 (16+4) marks out of 50 are required for passing.
- Practical Examination will be conducted annually for 200 marks. Out of which 100 marks for DSE-501 & DSE-601 combined and 100 marks for DSE-502 & DSE-602 combined. Minimum 40 (40%) marks are required for passing in each case.
- Project Work will be evaluated for 100 marks and minimum 40 (40%) out of 100 are required for passing.
- There will be practical examination for SEC conducted **internally semester wise** of 50 marks and 20 (40%) marks are required for passing.
- Separate passing for theory, practical and project.

B.Sc. Computer Science (Entire) Part-III

Year of Implementation: Revised Syllabus will be implemented from June 2024
Duration: Part- III shall be of one academic year consisting of two semesters.
Pattern: Semester Pattern.

STRUCTURE OF THE SYLLABUS

Code	Course	Course Title
SEMESTER – III		
DSE-501	Computer Science Paper - IX	Core java
DSE-502	Computer Science Paper - X	Introduction to C# Programming
DSC-503	Computer Science Paper - XI	Software Engineering
DSE-504	Computer Science Paper - XII	Machine Learning - I
OR		
DSE-505	Computer Science Paper - XII	Data Communication
SEC - V	Skill Enhancement Course - V	Introduction to PHP – I
AECC-E	English Paper- III	English for Communication - III
SEMESTER – IV		
DSE-601	Computer Science Paper - XIII	Advanced Java
DSE-602	Computer Science Paper - XIV	Introduction to ASP.NET
DSE-603	Computer Science Paper - XV	Software Project Management
DSE-604	Computer Science Paper - XVI	Machine Learning - II
OR		
DSE-605	Computer Science Paper - XVI	Computer Networks
SEC-VI	Skill Enhancement Course - VI	Introduction to PHP – II
AECC-F	English Paper-IV	English for Communication - IV
LAB-8	Lab Course Based on DSE-501 & DSE-601	
LAB-9	Lab Course based on DSE-502 & DSE-602	
LAB-10	Lab Course based on SEC-V & SEC-VI	
PW	Lab Course based on PROJECT WORK	

- DSE   : Discipline Specific Elective
- SEC   : Skill Enhancement Course
- AECC   : Ability Enhancement Core Course
- PW   : Project Work

Choice Based Credit System with Multiple Entries and Multiple Exit Option (NEP-2020)
B.Sc. Computer Science (Entire) Part III
Syllabus to be implemented from June 2024 onwards.
Course: Computer Science

1. Title   : Computer Science
2. Year of Implementation   : Revised Syllabus will be implemented from June 2024 onwards.
3. Duration   : B.Sc. Computer Science (Entire) Part- III The duration of course shall be One year and Two semesters.
4. Pattern   : Pattern of examination will be semester.
5. Structure Of Course   :

Sr. No.	Code	Paper	Name of Paper	Marks
SEMESTER - V				
1	DSE-501	Paper - IX	Core Java	50 (40 Univ +10 Internal)
2	DSE-502	Paper - X	Introduction to C# Programming	50 (40 Univ +10 Internal)
3	DSC-503	Paper - XI	Software Engineering	50 (40 Univ +10 Internal)
Elective Course I: DSE-504 OR DSE-505				
4	DSE-504	Paper - XII	Machine Learning - I	50 (40 Univ +10 Internal)
	DSE-505	Paper - XII	Data Communication	50 (40 Univ +10 Internal)
5	AECC-E	English Paper - III	English for communication- III	50 (40 Univ +10 Internal)
SEMESTER - VI				
6	DSE-601	Paper - XIII	Advanced Java	50 (40 Univ +10 Internal)
7	DSE-602	Paper - XIV	Introduction to ASP.NET	50 (40 Univ +10 Internal)
8	DSC-603	Paper - XV	Software Project Management	50 (40 Univ +10 Internal)
Elective Course II: DSE-604 OR DSE-605				
9	DSE-604	Paper - XVI	Machine Learning - II	50 (40 Univ +10 Internal)
	DSE-605	Paper - XVI	Computer Networks	50 (40 Univ +10 Internal)
10	AECC-F	English Paper - IV	English for communication- IV	50 (40 Univ +10 Internal)

Practical Examination (Annual)

Sr. No.	Code	Name of Paper	Marks
1	LAB-8	Lab Course Based on DSE-501 & 601	100
2	LAB-9	Lab Course based on DSE-502 & 602	100
3	PW	Project Work	100
There will be practical examination for SEC conducted **internally semester wise** of 50 marks and 20 (40%) marks are required for passing.			
4	LAB-10	Lab Course based on SEC - V & SEC - VI	100 (50+50)

Note-
- Four Lectures per theory course per week.
- Lab Course five periods (four hours) per week per 20 student's batch.

♦ SCHEME OF EXAMINATION: -

- The Theory examination shall be conducted at the end of each semester.
- The Theory paper shall carry 40 Marks and Internal Evaluation carry 10 marks.
- There shall be theory exam on SEC - V & SEC – VI (MCQ based Examination for each Semester)
- The practical examination shall be conducted at the end of each year.
- The Practical paper shall carry 100 marks.

♦ STANDARD OF PASSING: -

- A student will have to secure 40% of marks in theory and practical examinations each.
- Nature of Practical Question Paper and scheme of marking (ANNUAL)

♦ Nature of theory question paper

- As per regular B.Sc. Program.

♦ Nature of Practical Question Paper For LAB-9, LAB-10.

- The practical paper shall carry 100 marks.
- There shall be two Sections.
- **LAB-9**: Section I shall be based on *Paper-IX (DSE-501)* and Section II based on *Paper-XIII (DSE-601)*.
- **LAB-10**: Section I shall be based on *Paper-X (DSE-502)* and Section II based on *Paper-XIV (DSE-602)*.
- Each Section shall be of three questions out of which one question is compulsory from each section.
- Student has to solve total three questions.
- Each Question carries 25 marks.
- *Certified Journal* carries *10 marks* and *Viva* carries *15 marks*.
- The *Total Time Duration* of the *Practical Examination* should be *4 hours*.
- **Project Work (PW)** is of 100 marks.
- **LAB-11**: Conduct Internal Practical examination on SEC-V in Semester V and SEC-VI in Semester VI.

Course Code: **DSE-501**: Computer **Paper - IX**
Course Title: **Core Java**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Develop Object oriented software application
- Implement Object oriented concepts using java)
- Develop multithreading applications
- Handle exceptions while executing programs

Unit	Content	Hours Allocated

1	**Java Language Basics**
	• History and features of Java
	• Java Virtual Machine (JVM)
	• JDK tool (Folder structure-for practical purpose only)
	• Structure of java program, compilation and execution of java program
	• Java keywords, Data types
	• Java variables- declaration and assigning values to variables (using assignment statement and Scanner class object), scope of variables
	• Type casting- Implicit and Explicit casting
	• Operators of java
	• Control structures of java –
	   1) Branching statements- If, if---else, if …else if and switch statement
	   2) Iterative statements- for loop, do… while loop, while loop
	   3) Jumping statements-break and continue statement.
		12

2	**Introducing classes and objects** • Introduction: Classes, Objects and methods • Defining a class, field declaration, method declaration • Accessing class members, access specifiers in java • Static variables and methods. • Method overloading • Constructor- types of constructors, constructor overloading • Use of this keyword • Garbage collection-finalize(), wrapper classes • Array, types of arrays, array of object • Collection-Iterator interface, List interface, ArrayList class, LinkedList class, Vector class and Stack class.	12
3	**Inheritance, packages and interfaces** • Inheritance- definition, syntax, types of inheritance • Method overriding, use of super keyword, difference between method overloading and overriding • Dynamic method dispatch • Abstract class and method, use of final keyword • Interface- defining and implementing interface, implementation of multiple inheritance using interface, difference between abstract class and interface. • Packages- Java API package, Defining and accessing user defined package	12

4	**Exception Handling and Multithreading** • Concept of exception, difference between error and exception • Types of exceptions-checked and unchecked • Exception handling using try and catch block • Multiple catch block, finally block, throws keyword • User defined exception • Concept of multithreading in java, Difference between process and thread • Creating thread by extending Thread class and by implementing Runnable interface • Life cycle of thread, Thread class methods- start(), run(), yield(), suspend(), resume(), sleep(), wait(), notify(), stop() • Thread synchronization	**12**

Text Book / Reference Book:
1. Herbert Schildt, Java2: The Complete Reference, Tata McGraw-Hill
2. Object Oriented Programming with JAVA Essentilas and Applications, Mc GrawHill
3. Core and Advanced Java, Black Book- dreamtech
4. Programming with JAVA- E Balagurusamy

Course Code**: DSE-502**: Computer **Paper - X**

Course Title: **Introduction to C# Programming**

Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Understand working of .Net Framework
- Demonstrate concept of Object-oriented programming using C#
- Study importance and applications of exception handling
- Understand working of file handling in C#.

Unit	Content	Hours Allocated
1	**Dot Net Framework:** • Overview, component Architecture of .Net framework, • Features of .NET, Evolution of .net framework • Meta data and assembly • CLR, Managed and unmanaged code • MSIL, JIT Compiler, CTS, CLS • Compilation and execution process, NET base classes, namespace.	12
2	**C# Basics:** • Introduction to C#, Entry point method, command line arguments • Control statements, looping statements, Arrays, String • CSC.EXE, Different valid forms of main • Global stack and heap memory, reference type and data type • Type Casting-Implicit and Explicit, Boxing and unboxing • Pass by value and pass by reference and out parameters.	12
3	**C# Object Oriented Concepts:** • Class, static and non-static methods • Delegate- Syntax, importance, example • Inheritance, Polymorphism, Interface, Abstract Class • Partial Class, DLL, Difference between DLL and EXE.	12
4	**Exception Handling and File I/O:** • Introduction to exception, Importance in C#, try, Catch, Finally blocks • Exception classes, Handling Exceptions • User define exceptions and System define exceptions. • Concept of File Handling, Importance • C# I/O Classes • File Stream Class, File operations using C#.	12

Text Book / Reference Book:

1. C# 4.0 The Complete Reference Schildt Mc Graw Hill

2. Inside C# - By Tom Archer, Andrew Whitechapel (Microsoft Pub)

3. Programming in C#- E Balagurusamy

Course Code**: DSE-503**: Computer **Paper - XI**

Course Title: **Software Engineering**

Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Understand the problem domain to choose process models correctly.
- Choose software projects using appropriate design notations.
- Measure the product and process performance using various metrics.
- Evaluate the system with various testing techniques and strategies
- Able to analyze, design, verify, validate, implement, and maintain software systems.

Unit	Content	Hours Allocated
1	**Software Engineering Fundamentals** • Importance of software, Definition and need for Software Engineering, • Software engineering paradigms, • Characteristics of good quality software, Software Development Life Cycle. • Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model • Evolutionary Software Process Models: Incremental Model, Spiral Model • Analysis Concepts and Principles.	12
2	**Software Project Planning** • Software Project Planning • Size Estimation, Cost Estimation Models - COCOMO, The Putnam Resource Allocation Model • Risk Identification and Projection: RMMM, • Project scheduling and Tracking • Software Design Process, Design Principles, • Design Concepts: Effective Modular Design, Design Heuristics, Design Documentation (SRS), • Design Methods: Data Design, Architectural Design, Interface Design, Procedural Design.	12
3	**Software Testing** • Software Testing Fundamentals • White Box Testing, Black Box Testing • Software testing strategies, • verification and Validation, • System Testing, Unit testing, Integration testing and Debugging • Implementation types, Software Maintenance, Maintenance Tasks.	12
4	**Unified Modeling Language (UML)** • Object- oriented concepts and principles • Unified Modeling Language, UML views • Basic structures and modeling classes, common modelling techniques, relationships, common mechanism • Advanced structured modeling, advanced classes and relationships, Interfaces, types and roles • Static diagrams- class diagram, object diagram, Component diagrams • Dynamic diagrams- Use case diagrams, State diagrams, Interaction diagrams, Sequence diagrams.	12

Text Book / Reference Book:
1. Roger S Pressman, Bruce R Maxim, "Software Engineering: A Practitioner's Approach", Kindle Edition.
2. Ian Sommerville," Software engineering", Addison Wesley Longman, 2014.
3. James Rumbaugh. MichealBlaha "Object oriented Modeling and Design with UML", 2004.

B. Sc. Computer Science (Entire) Part- III (Semester V)
Elective Course-I
Course Code**: DSE-504**: Computer **Paper - XII**
Course Title: **Machine Learning Part- I**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to
- Develop an appreciation for what is involved in learning models from data.
- Understand a wide variety of learning algorithms.
- Understand how to evaluate models generated from data.

Unit	Content	Hours Allocated
1	**Introduction to Machine Learning** • Introduction • Evolution of machine learning • Difference between AI and Machine learning • Developments in machine learning • Introduction to K-nearest neighbour method, different phases of predicative modeling	12
2	**Aspects of Machine Learning** • Definition of learning System • Goals and applications of machine learning • Aspects of developing a learning system: training data, concept • representation, function approximation	12
3	**Machine Learning Modelling** • ML Modeling flow, How to treat Data in ML? • Types of machine learning, performance measures • Bias-Variance Trade-Off • Overfitting & Underfitting, Bootstrap Sampling, Bagging, Aggregation	12
4	**Basic Probability and terms** • Rules of probability, permutations and combinations • Bayers theorem, Descriptive statistics, compound probability, conditional probability	12

Text Book / Reference Book:

1. Ethem Alpaydin, Introduction to Machine Learning, Second Edition

2. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.

3. Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2nd edition, 1991.

Elective Course-II
Course Code**: DSE-505**: Computer **Paper - XII**
Course Title: **Data Communication**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Develop an appreciation for what is involved in learning models from data.
- Understand a wide variety of learning algorithms.
- Understand how to evaluate models generated from data.

Unit	Content	Hours Allocated
1	**Data and signals** • Data and Signals: Introduction, Objectives, • Analog and Digital signals, Periodic Analog Signals, Digital Signals, • Transmission Impairment Attenuation, Distortion, Noise, Data Rate Limits, • Noiseless channel: Nyquist bit rate, Noisy channel: Shannon capacity, Performance, Bandwidth, Throughput, Latency, Bandwidth-delay product, • Shannon capacity Performance − types of Error − Error Detection − Error corrections.	12
2	**Introduction to Data Communication** • Introduction to Data Communication: Definition, components, • characteristics, • Uses of computer networks for companies, • Protocol: Protocol standards, Transmission media: Introduction, • Guided media: twisted pair cable, co‑axial cable, fiber‑optic, • Unguided media (wireless) - radio waves, microwaves, infrared. • Switching: Introduction, Objectives, Circuit switched networks, Datagram networks, Virtual circuit networks, • Router and Routing − Factors affecting routing algorithms - Routing algorithm -Approaches to routing	12
3	**Introduction to Data communication modes** • Data communication modes: Serial and Parallel, Simplex, Half duplex and full duplex, • Synchronous and asynchronous transmission, • Multiplexing - Types of Multiplexing - FDM versus TDM, • Parallel and serial Transmission − DTE/DCE/such as EIA-449, EIA- 202 and X21 interface − Interface standards	12
4	**Introduction to Networking protocols and OSI model** • Introduction − Protocols in computer communications • The OSI model - OSI layer functions. • Integrated services digital networking (ISDN): Introduction −Background of ISDN - ISDN architecture − ISDN interfaces - Functional grouping − Reference points • ISDN protocol architecture - Broadband ISDN (B-ISDN) of ATM −Packet size − Virtual circuits in ATM − ATM cells − Switching −ATM layers − Miscellaneous Topics.	12

Text Book / Reference Book:

1. Behrouz and forouzan - Introduction to Data Communication and Networking – 2 nd Edition – TMH- 2001. 2. Jean Walrand – Communication Networks (A first Course) – Second Edition – WCB/McGraw Hill – 1998.
2. Computer Network by Tanenbaum
3. Computer network – black
4. Data Communications and Networks, ACHYUT. S. GODBOLE, Tata McGraw-Hill Publishing Company, 2007.
5. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson
6. Computer networks, A system Approach, 5th ed, Larry L Peterson and Bruce S Davie, Elsevier

Course Code: **AECC-E**: English **Paper-III**
Course Title: **English for communication - III**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

⬥ comprehend communication process, methods of communication and flow of communication in business context.

⬥ Apply acquired LSRW skills into real life situations and in professional context.

⬥ Compose effective business letters using standard language, style and structure.

Unit	Content	Hours Allocated
1	**Essentials of Communication:** • Communication basics: definitions, process, levels • Forms/methods: verbal and non-verbal • Barriers and solutions • Flow/channels in business communication • Cross cultural communication	12
2	**Basics of Effective Communication (Listening and Speaking):** • **Effective listening**: process of listening, types of listening, poor listening habits, strategies for effective listening • **Effective speaking**: various forms of speaking in business professional, art of public speaking	12
3	**Basics of Effective Communication (Reading, Writing, Thinking)** • **Effective reading**: need, types, methods/tips/strategies, comprehension • **Effective writing**: punctuation marks, precis writing (of technical, scientific, or industry-oriented text), technical paragraph writing, email and blog writing • **Thinking**: Thinking as a learning skill	12
4	**Business Correspondence (Letter writing):** • Principles, elements • Layout (complete block, modified block, semi-block), • Types (enquiry and replies, order, claim and adjustment)	12

Text Book / Reference Book:

1. Communication Skills by Sanjay Kumar and Pushpa Lata, Oxford University Press.

2. Business Communication by Meenakshi Raman and Prakash Singh, Oxford University Press.

3. Technical Communication by Meenakshi Raman and Sangeeta Sharma, OUP.

Course Code**: DSE-601**: Computer **Paper - XIII**
Course Title: **Advanced Java**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to
- Develop GUI using Java.
- Handle Database connectivity using java.
- Develop dynamic web pages using servlet and JSP.
- Develop client-server application.

Unit	Content	Hours Allocated
1	**Java Swing** • Introduction, Swing container classes - JFrame, JDialog • Swing component classes-JTextField, JTextArea, JButton, JomboBox, JLabel, JList, JMenuBar, JTabbedPane, JOptionPane, JPanel, JTree, JTable, JMenu • Layout Manager- FlowLayout, BorderLayout, GridLayout, GridBagLayout • Event Handling	12
2	**Java Database Connectivity** • Introduction, JDBC driver and its types, JDBC connection steps • JDBC API - DriverManager class, Connection interface, Statement interface, Prepared Statment interface and ResultSet interface • Connectivity with MySQL using JDBC • Simple JDBC program	12
3	**Java Servlet** • Introduction to servlet, Web terminology- static vs dynamic website, HTTP, HTTP request, Get vs Post, Container, Content Type • Life cycle of servlet • Servlet API- javax.servlet and javax.servlet.http • javax.servlet package interfaces(Servlet,ServletConfig, ServletContext), classes (GenericServlet) • javax.servlet.httpinterfaces(HttpServletRequest,HttpServletResponse), classes (HttpServlet) • Introduction to Session, session tracking techniques • Cookies- types of cookies	12
4	**Java Server Pages** • Introduction to JSP, JSP vs Servlet, Life cycle of JSP, JSP scripting elements - JSP scriptlet tag, JSP expression tag, JSP declaration tag, JSP implicit objects, JSP directive elements • JSP action elements- jsp:forward, jsp:include, • Simple JSP application	12

Reference books-

1. Herbert Schildt, Java2: The Complete Reference, Tata McGraw-Hill
2. Object Oriented Programming with JAVA Essentilas and Applications, Mc GrawHill
3. Core and Advanced Java, Black Book- dreamtech
4. Murach's Java Servlets and JSP

Course Code**: DSE-602**: Computer **Paper - XIV**

Course Title: **Introduction to ASP.NET**

Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Understand working of Asp.Net web application
- Demonstrate Asp.Net server controls
- Study database operations using ADO.Net.
- Understand importance and working of state management.

Unit	Content	Hours Allocated
1	**Introduction to ASP.Net:** • Web browser, web server • HTTP request response structure • HTML form elements, GET/POST method • Client side and Server-side programming. • Web form life cycle, page events, Visual studio IDE.	12
2	**Server Controls:** • Textbox, Listcontrols, Linkbutton, Imagemap, Image, Imagebutton, FileUpload, Calender, Literal control, Radiobutton, Checkbox • Validation Controls • Navigation controls- Menu, TreeView, SiteMapPath • Master Page, Sitemap, SitemapDatasource	12
3	**Asp.Net State Management:** • Cross page postback property of button • Response.Redirect, Server.transfer, Response.Write • Client Side: Hiddenfield control, View State, Cookies • Server Side: Session, Application, Global.asax.	12
4	**Database and ADO.Net:** • Sql Server Database. • Datacontrols- Gridview, Listview, FormView, DetailsView, Repeter, SqlDataSource • Introduction to ADO.Net, ADO.NET Architecture- Connection, command, data reader, Data adapter, data set • Understanding connected layer of ADO.NET and disconnected layer of • ADO.NET	12

Reference:

1. ASP.NET Black Book- By Steven Holzner
2. Professional ASP.NET 2 –Wrox Series- Wallace B. McClure
3. Asp.Net using C#- Rajendra Salokhe
4. Asp.Net: The Complete Reference Schildt McGraw Hill

Course Code**: DSE-603**: Computer **Paper - XV**
Course Title: **Software Project Management**
Total Contact Hours: **48 hrs.** (**60 lectures of 48 min**)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Implement the basics of Project Management.
- Choose correct Scheduling Techniques as per the software
- Develop Team Development skills and reduce conflicts
- Implement various Software Quality Standards.
- Using CASE tools, Software Re-Engineering for creating efficient software.

Unit	Content	Hours Allocated
1	**Overview of Project Management** Project Management – Definitions, Factors Influencing Project Management – Project Manager, Project Management Activities, Stakeholders, Project Communication, Project Development Phases, Project Charter; Statement of Work (SoW), Project Planning: Tasks in Project Planning, Work Breakdown Structures (WBS), Planning Methods, Development Life Cycle Models, A Generic Project Model.	12
2	**Scheduling Techniques and Conflict Management:** Program Evaluation and Review Technique (PERT), Gantt Chart and critical Path Method (CPM), Automated Tools, Project Monitoring and Controlling: Project Status Reporting, Project Metrics, Project Communication Plan & Techniques, Steps for Process Improvement. **Team Development and Conflict Management**: Basic Concepts, Organization Types – Centralized-control team organization, Decentralized-control team organization, Mixed-control team organization.	12
3	**Software Configuration Management (SCM)** – Baselines, Software Configuration Items (SCI), SCM Process, Version Control, Change Control, Configuration Audit, Status Reporting, Goals of SCM**.** **Software Quality Assurance:** Software Quality Assurance Activities, Software Qualities, Software Quality Standards – ISO Standards for Software Organization, Capability Maturity Model (CMM), Comparison between ISO 9001 & CMM.	12
4	**Computer Aided Software Engineering (CASE) Tools** CASE Concepts, Classification of CASE Tools, Steps for CASE Tool Implementation, Integrated CASE Environments, Architecture of CASE Environment. **Software Re-Engineering**: Software Maintenance Problems, Redevelopment vs. Reengineering, Business Process Reengineering, Software Reengineering Process Model, Technical Problems of Reengineering	12

Text Book / Reference Book:

1. Roger S Pressman, Bruce R Maxim, "Software Engineering: A Practitioner's Approach", Kindle Edition, 2014.
2. Ian Sommerville," Software engineering", Addison Wesley Longman, 2014.
3. Software Project Management by Edwin Bennatan.
4. Software Project Management by S.A. Kelkar

Elective Course-I
Course Code**: DSE-604**: Computer **Paper – XVI**
Course Title: **Machine Learning Part- II**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**　　　　　　　Teaching Scheme: **Theory - 04 Lect. / Week**　　　　Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to
- Understand complexity of Machine Learning algorithms and their limitations.
- Understand modern notions in data analysis-oriented computing.
- Apply common Machine Learning algorithms in practice and implementing their own.
- Perform distributed computations

Unit	Content	Hours Allocated
1	**Emerging applications of machine learning** • Healthcare • Education • Transport and logistics • Public services • Finance • Pharmaceuticals • Energy • Legal sector • Manufacturing, Retail	12
2	**Machine learning methods** • Supervised machine learning algorithms • unsupervised machine learning algorithms • Semi-supervised machine learning algorithms • Reinforcement machine learning algorithms	12
3	**Canonical problems in machine learning** • Classification • Regression • Clustering • Dimensionality Reduction • Semi-supervised Learning • Reinforcement learning	12
4	**Neural Network** • Introduction to neural network • Biological inspiration • Perception learning & Binary Classification • Back propagation Learning, Object recognition • Natural Language Processing: Word sense disambiguation, • Pronoun resolution, Machine translation, Tokenization, Regular Expression	12

Text Book / Reference Book:

1. Ethem Alpaydin, Introduction to Machine Learning, Second Edition
2. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.
3. W.F. Clocksin and Mellish, Programming in PROLOG, Narosa Publishing House, 3rd edition, 2001.

Course Code**: DSE-605**: Computer **Paper – XVI**
Course Title: **Computer Networks**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)

Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to

- Familiar with network basics concepts like protocols, topology etc.
- Familiar with OSI layered model services.
- Understand with switching and routing concepts in networking technologies.
- Familiar with network security concepts.

Unit	Content	Hours Allocated
1	**Network Basics** • Network definition; network topologies • network classifications; network protocol • Layered network architecture; overview of OSI reference model, Overview of TCP/IP protocol suite. • The telephone network fundamental of communication theory. • Asynchronous and synchronous transmission. • Transmission Media: Guided media - twisted-pair cable, coaxial cable, fiber-optic cable. Unguided media (wireless) -radio waves, microwaves, infrared. • Connection-oriented and connectionless Services, service primitives.	12
2	**Switching & routing concepts** • Switching and routing in network: Message switching, packet switching, packet routing. • Routing − characteristics, routing algorithms(strategies) −optimality principle, shortest path routing, flooding, distance vector routing, link-state routing, hierarchical routing, broadcast routing, multicast routing. Congestion control. And its prevention policies	12
3	**Protocols** • Goals of layered protocols, network design problems, OSI model and its all-layers services. Token passing − Token ring, Token bus, Token passing (priority systems). ANSI Fiber Distributed Data Interface (FDDI), • TCP/IP: Introduction to TCP/IP and internetworking, operations related protocols and sockets, IP address structure major features of IP, IP data gram, major IP service, TCP major features of TCP, passive and active operant the transmission control blocks (TCB).	12
4	**Physical Layer concept** • Physical Layer Basic Concepts - Bit rate, bit length, base band transmission, • Network Security- Introduction, concept of cryptography, authentication protocols, firewall, virtual private networks (VPN), wireless security, email security, • web security- SSL, Digital signature – symmetric key signature, public key signature, and message digest	12

Text Book / Reference Book:

1. Black C "Computer networks protocols, standards and Interface", prentice hall of India
2. Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, Tata McGraw − Hill,
3. Tanenbaum A.S. "Computer Network", prentice hall of India
4. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill.

B. Sc. Computer Science (Entire) Part- III (Semester VI)
Course Code: **AECC-F**: English **Paper-IV**
Course Title: **English for communication - IV**
Total Contact Hours: **48 hrs.** (60 lectures of 48 min)
Credits: **02**   Teaching Scheme: **Theory - 04 Lect. / Week**   Total Marks: **40**

Course Outcomes:

After completion of this course student should be able to
- Comprehend the employment skills to have an effective first impression.
- Construct effective technical reports and prepare effective presentations.
- Use various interpersonal skills as per the need of situation and context.

Unit	Content	Hours Allocated
1	**Employment Communication**: • Covering letter and resume writing • Group discussion: purpose, nature, do's and don'ts, body language, tips and strategies • Interviews: types, FAQs, elements of preparation, do's and don'ts of winning job interviews, tips and techniques	12
2	**Technical report writing and presentation**: • Importance of reports, objectives, characteristics • Categories of report, • Formats (memo, letter) • Structure/elements of manuscript reports • Preparing effective presentations, • Techniques of effective collaborative/team presentations	12
3	**Essential Interpersonal Skills/Soft Skills** • Developing personality: various personality traits, types of personalities, tips • Self-esteem: Know thyself • Positive attitude building • Emotional intelligence (EQ)	12
4	**Essential Interpersonal Skills/Soft Skills** • Teamwork • Leadership • Time management • Business ethics and values	12

Text Book / Reference Book:

1. Communication Skills by Sanjay Kumar and Pushpa Lata, Oxford University Press.
2. Business Communication by Meenakshi Raman and Prakash Singh, Oxford University Press.
3. Technical Communication by Meenakshi Raman and Sangeeta Sharma, OUP.
4. Personal Development for Life and Work by Masters and Wallace, Cengage Learning.
5. Managing Soft Skills for Personality Development by B.N. Ghosh, Tata McGraw Hill.
6. Soft Skills by K. Alex, S. Chand and Company.

Lab Course 8 (Lab course based on DSE-501 & DSE-601)
Practical Program List

DSE 501- Core Java

1. Program on type casting.

2. Program on branching and looping statements.

3. Program on class, objects, field and method.

4. program on method overloading.

5. program on Constructor and constructor overloading.

6. Program on Array.

7. Program on Collection.

8. Program on Inheritance.

9. program on Packages.

10. program on abstract class.

11. program on interface.

12. Program on Exception Handling and user defined exception.

13. Program on multithreading (e.g., create and run multiple threads using different thread life cycle methods)

DSE 601- Advanced Java

1. Program to design simple frame using swing components like JButton, JLabel, JTextField

2. Program to design simple frame using swing components like JButton, JLabel, JTextField, JComboBox and JCheckBox

3. Program on JDBC.

4. Program to design simple Login Page application using JDBC.

5. Program on servlet.

6. Program to maintain session using cookies

7. Program to create simple JSP application to check given number is prime or not.

8. Program to create simple JSP application to print Fibonacci sequence for given number.

9. Program to create simple JSP application to check given string is palindrome or not.

Practical Program List

DSE - 502: C# programming

1. Program on parameter passing mechanism.

2. Program on command line argument.

3. Program on type casting.

4. Program on looping statements.

5. Program on control structure.

6. Program on DLL and EXE

7. Program on array.

8. Program on static and non-static methods.

9. Program on Inheritance.

10. Program on Interface.

11. Program on abstract class.

12. Program on partial class.

13. Program on exception handling- Arithmetic exception, Array exception, File Exception, Null Reference Exception.

14. Program on user define exception.

15. Program on File I/O functions

DSE - 602: ASP.Net

1. Program on server controls

2. Program onSqlDataSource.

3. Program on data controls

4. Program on ADO.Net connected architecture.

5. Program on ADO.Net disconnected architecture

6. Program onResponse.Redirect.

7. Program on cross page posting.

8. Program on client-side state management.

9. Program on server-side state management.

10. Program to design master page for university website.

B.Sc. Computer Science (Entire) Part-III
SEMESTER - V
Skill Enhancement Course – V
Course Code: **SEC- V** Course Title: **PHP Part - I**

Course outcome: After completion of this course student will be able to
   1. Identify basic PHP syntax
   2. Create basic PHP scripts
   3. Know how to send data to the Web Browser
   4. Apply variables, string, and constant to a PHP a script

Unit –I **PHP Installation**
- Installation of PHP
- Installation Of Apache
- Binding PHP to Apache
- XAMPP Installation
- XAMPP Control Panel Folder Structure
- Upgrading PHP in XAMPP
- Installing Multiple Version of PHP on Single machine in XAMPP
- PHP and Apache Configuration Files
- WAMP Installation
- WAMP menu and folders structure
- Executing PHP Programs on ellipse

Unit –II **Introduction to PHP**
- What is PHP?
- What does PHP do?
- Benefits of using PHP MYSQL
- PHP Scripts Work
- PHP syntax
- First PHP Program
- Embed PHP in HTML / HTML in PHP
- Data Types, variables, PHP Constants type Casting, operators, PHP strings

Unit-III **Control Structure**
- If Statement
- If …….. Else statement
- If…….. if else Statement
- Nested if statement
- Switch statement

Unit-IV Looping Structure
- For loop
- While loop
- Do……while loop
- For each loop

Reference Books
   1. PHP Concepts Unleashed for Novice – Vol I
         Dr. Poornima G. Naik (Author), Dr. Kavita S. Oza (Author)
   2. PHP Concepts Unleashed for Novice – Vol II
         Dr. Poornima G. Naik (Author), Dr. Kavita S. Oza (Author

Skill Enhancement Course – VI
Course Code: **SEC- VI** Course Title: **PHP Part- II**

Course outcome: After completion of this course student will be able to

1. Create and call functions using PHP
2. Create functions that take arguments and return values
3. How error is handled using exception handling
4. Display and handle HTML forms within a single PHP script

Unit I **Arrays in PHP**

- Types of Arrays
  Indexed Arrays, Associative arrays, Multidimensional arrays
- Sorting Arrays
- Displaying contents of an Arrays in HTML table

Unit-II **Function In PHP**

- What is function?
- Syntax
- Conditional Functions
- Functions with parameters
- Function with Relive in Values
- Assigning Default values to function parameters
- Functions with static variables
- Passing Array to A Function and returning list
- Nested Functions
- Recursive functions
- Anonymous Functions
- Dynamic Function Calls
- Call Back function

Unit –III **Exception Handling in PHP**

- Error Handling: Definition of Exception, Standard Keywords, General Structure
- Difference between Exception and error
- Uncaught Exception
- Rules Governing Exception Handling
- Predefined Exception
- Methods of Exception class
- Catching Multiple Exception
- Nesting try Blocks

Unit- IV **Web Development in PHP**

- Static and dynamic web pages
- Communication between HTML and PHP
- Difference between get and post requests
- HTML Special chars() function
- Guidelines in Designing a form
- Form validation
- Handling Multi- Valued form fields.
- Uploading a file in PHP.

Reference Books

1. PHP Concepts Unleashed For Novice – Vol I
     Dr. Poornima G. Naik (Author), Dr. Kavita S. Oza (Author)
2. PHP Concepts Unleashed For Novice – Vol II by
     Dr. Poornima G. Naik (Author), Dr. Kavita S. Oza (Author)

SEC V- PHP Part- I

1. Program to use echo and print statement in PHP.

2. Program on global and local variables in PHP.

3. Program on type casting in PHP.

4. Program on operators in PHP.

5. Program on string functions in PHP.

6. Program on different control structures. (if, if…else, nested if, switch)

7. Program on different looping structures. (for, while, do while, for each loop)

SEC VI- PHP Part- II

1. Program to create, initialize and display array elements.

2. Program on indexed array.

3. Program on associative array.

4. Program on multidimensional array.

5. Program on sorting array.

6. Program on user defined function.

7. Program on passing array to a function.

8. Program on recursive function.

9. Program on exception handling.

10. Program to create static and dynamic web page using PHP.

11. Program on form validation in PHP.

12. Program to upload file in PHP

Project work guidelines:

1. Project report has to be prepared with every aspect of software engineering.
2. Student has to present the demonstration of project concerned at the time of project viva-voce.
3. Project will have internal guide to supervise and monitor the progress of the project. The internal guide may assign the project within the group of students (maximum 2 students in a group) using MySQL as a back end and Visual Programming Using C# or Java Programming or PHP as front end.
4. There will be online demonstration of project work in the presence of the external examiner and it will be considered for the evaluation.

The distribution of **100 marks** shall be as follows:

- Project Documentation : *30 marks*
- On-line Presentation : *40 marks*
- Project Based Viva-voce : *30 marks*
- Total Marks : **100 marks**

Project Work

- **Guidelines for Project**:
- **Number of Copies**: The student should submit two Hard-bound copies of the Project Report. (*one copy for institute and one copy for student*)
- **Acceptance/Rejection of Project Report**:

  The student must submit an outline of the project report to the college for approval. The college holds the right to accept the project or suggest modifications for resubmission.
- **Format of the Project Report**:

  The student must adhere strictly to the following format for the submission of the Project Report.

  a. Paper: The Report shall be typed on *white paper, A4 size*, for the final submission.

  b. Typing: The typing shall be of *standard letter size*, *1.5 spaced* and *on one side* only.
  - *Normal text* should have *Times New Roman* Font size *12*.
  - *Headings* have bigger size i.e. up to size *14*

  c. Margins: The typing must be done in the following margins:
  - Left -----*1.5 inch*, Right ----- *1 inch*
  - Top -----*1 inch*, Bottom ----- *1 inch*

- **Standard Project Report Documentation Format:**
    a) Cover Page

    b) Institute/College Recommendation

    c) Guide Certificate

    d) Declaration

    e) Acknowledgement

    f) Index

    g) Chapter Scheme

    1) *Introduction to Project*

    -Introduction

    -Existing System

    -Need and scope of Computer System

    -Organization Profile

    2) *Proposed System*

    -Objectives

    -SRS

    3) *System Analysis*

    System Diagram

    • DFD

    • ERD

    • UML (if applicable)

    4) *System Design*

    • Database Design

    • Input Design

    • Output Design

    5) *Implementation*

    - System Requirements

    • Hardware

    • Software

    - User Guideline

    6) *Outputs-*

    Screens and Reports (with valid Data)

    7) *Conclusion*

    8) *Future Enhancement*

    9) *Bibliography*

Note: Minimum 4 to 6 reports are essential.