2nd Semester

Sem	Core (DSC) 4 credits	Elective (DSE) 4 credits	Generic Elective (GE) 4 credits	AEC 2 credits	SEC 2 credits	Internship\ apprenticeship\ Project\ Community outreach 2 credits	VAC 2 credits	Total Credits
I	DSC 04 DSC 05 DSC 06	NIL	Choose one from a pool of courses GE-1 (04)	Choose one from a pool of AEC courses (02)	Choose one from the pool of SEC courses (02)	NIL	Choose one from the pool of VAC courses (02)	22 Credits

DISCIPLINE SPECIFIC CORE COURSE – 04

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Basics of Python Programming	**4**	**3**	**0**	**1**	**Class XII Pass**	**NA**

Learning Objectives

The course is designed to introduce the programming concepts using python to students. The course aims to develop structured as well as object-oriented programming skills to solve real life problems.

Learning Outcomes

On successful completion of the course, students will be able to:

1. Interpret, develop and document modular Python programs of reasonable complexity.
2. Implement lists and user defined functions.
3. Analyze and solve real life problems using suitable and efficient programming constructs.
4. Analyze and solve real life problems using the concepts of object- oriented programming.

SYLLABUS OF DSC-04

Unit 1 Introduction to Python Programming: (2 weeks):

Problem solving strategies; Structure of a Python program; Syntax and semantics; Executing simple programs in Python, Identifiers and keywords; Literals, numbers, and strings; Operators; Expressions; Shorthand Notation, Input/output statements;

Unit 2 Control Structure & Function: (4 weeks):

Control structures - conditional statements (Simple if, if-else, if-elif-else), loop control statements (for, while, for-in), break, continue; Function - Built-in Function, Creating User Defined functions, passing arguments to a function, Default arguments, Function returning a value, Assert function.

Unit 3 Built-in Data Structures: (5 weeks):

Mutable and immutable objects; Strings - built-in functions for string traversal, string operators and operations; Lists - creation, traversal, slicing and splitting operations, passing list to a function; Tuples, sets, dictionaries and their operations.

Unit 4 Object Oriented Programming: (4 weeks):

Introduction to classes, objects and methods; Standard libraries.

Practical component: The practical assignment must include installation of software like Anaconda, Jupyter and Spyder notebook and list of python programs for implementation.

Essential readings

1. Balaguruswamy E. Introduction to Computing and Problem-Solving using Python, 2nd edition,

McGraw Hill Education, 2018.
2. Brown, Martin C. Python: The Complete Reference, 2nd edition, McGraw Hill Education, 2018.
3. Downey, A. B. Think Python How to think like a Computer Scientist, 3rd Edition, 2020. https://greenteapress.com/thinkpython2/thinkpython2.pdf

Suggested readings

1. Taneja, S., Kumar, N. Python Programming- A Modular Approach, 1st edition, Pearson Education India, 2018.
2. Guttag, J.V. Introduction to computation and programming using Python, 2nd edition, MIT Press, 2016.
https://mitpress.mit.edu/9780262337397/introduction-to-computation-and-programming-using-python

DISCIPLINE SPECIFIC CORE COURSE – 05

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Web Design and Development	4	3	0	1	Class XII Pass	NA

Learning Objectives

The course is designed to introduce the web page designing concepts using HTML and CSS to students. The course also aims to achieve competence amongst its students to develop correct and efficient online websites for businesses.

Learning Outcomes

On successful completion of the course, students will be able to:

1. To gain basic knowledge of HTML documents.
2. To understand basic various elements of HTML.
3. To understand HTML with CSS properties.

4. Explore structures and implementation of HTML, CSS and JavaScript.
5. Analyze, design and develop a website.

SYLLABUS OF DSC-05

Unit 1 Introduction to HTML (2 weeks):

Basic structure of an HTML document, markup tags, heading, paragraphs, line breaks, HTML tags.

Unit 2 Elements of HTML (5 weeks):

Elements of HTML, working with text, marquee text, text formatting, type of lists, tables, hyperlinks, internal hyperlinks, external hyperlinks, images, multimedia, inline elements, block level elements, frames, forms and controls.

Unit 3 Cascading Style Sheets (2 week):

Concept of CSS, creating style sheets, CSS properties, CSS styling (background, text format, controlling fonts), working with block elements and objects, CSS Id and class, box model (introduction, border properties, padding properties, margin properties).

Unit 4 Introduction to JavaScript (4 weeks):

Introduction to static and dynamic websites**,** basic programming techniques & constructs, GET/POST methods, operators, functions, DOM event handling, Forms validation.

Unit 5 Web Designs (2 week):

Creating page layout and site designs.

Practical component

The practical assignments must include exercises on creating static and dynamic websites using HTML, CSS and JavaScript on platforms like Notepad/Notepad++/Visual Studio.

Essential Readings

1. Bayross, I.. Web enabled commercial application development using HTML, JavaScript, DHTML and PHP, 4th edition, BPB Publication, 2013.
2. Boehm, A., Ruvalcaba, ZMurach's HTML5 and CCS3, 3rd Edition, Mike Murach &Associates, 2015.

Suggested Readings

1.Minnick, J. Web Design with HTML5 and CSS3, 8th Edition, Cengage Learning, 2015.

DISCIPLINE SPECIFIC CORE COURSE – 06

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Fundamentals of Statistics	**4**	**3**	**0**	**1**	**Class XII Pass**	**NA**

Learning Objectives

The objective of this course is to introduce the basic knowledge of data analysis using basic statistical tools.

Learning Outcomes

On successful completion of the course, students will be able to:

1. Analyze simple primary data numerically and graphically.
2. Gain the knowledge about probability theory and apply discrete and continuous probability distribution in real life situations.

SYLLABUS OF DSC-06

Unit 1: Data Visualization and Measures of Central Tendency: (4 weeks)

Diagrammatic presentation of data- bar graph, pie chart, histogram, frequency polygon, Ogive, scatter plot for bivariate data. Measures of central tendency (including graphical determination). Partition values (quartiles, deciles, and percentiles).

Unit 2: Measure of Variation: (3 weeks)

Absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and variance. Moments, kurtosis and skewness.

Unit 3: Probability theory: (3 weeks)

Introduction of probability theory, types of events, concept of conditional probability, Bayes Theorem.

Unit 4: Probability Distribution: (5 weeks)

Introduction to random variable, concept of discrete and continuous Probability Distribution Function (PDF). Discrete PDF- binomial, poison. Continuous PDF- uniform, exponential, normal.

Practical Component: The practical assignments must include exercises on implementing the statistical concepts covered in theory using Spreadsheet - open source software.

Essential Readings:

1. S.P Gupta, Statistical Methods, 46th Edition, Sultan Chand & Sons, 2021.
2. J E Fruend, Mathematical Statistics with Applications, 8th edition, Pearson Education, 2014.

Suggested Readings:

1. S C Gupta and V K Kapoor, Fundamental of Mathematical statistics, latest edition, Sultan Chand & Sons.
2. J. K. Sharma, Business Statistics, latest edition, Pearson Education.
3. Richard Levin and David S. Rubin, Statistics for Management, latest edition, Prentice Hall of India.

GENERIC ELECTIVES (GE-1)

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Front End Designing	**4**	**3**	**0**	**1**	**Class XII Pass**	**NA**