

S P Mandali's
R. A. PODAR COLLEGE OF COMMERCE AND
ECONOMICS (AUTONOMOUS),
Matunga, Mumbai-400019

Bachelor of Science (Data Science and Analytics)

Syllabus
And
Question paper pattern of Course

HYPERLINK "http://www.rapodar.ac.in" www.rapodar.ac.in

Bachelor of Science (Data Science and Analytics) Programme**Syllabus as per National Education Policy 2020***Course Structure***F.Y.B.S.C (Data Science and Analytics) (Level 4.5)****(To be implemented from Academic Year- 2024-25)**

No. of Courses	Course Code	Semester I	Credits
1		Major (06 credits)	
1.A		Data Science & Analytics -I	
1.A.a	PUF101101	Introduction to Programming	03
1.A.b	PUF101102	Descriptive Statistics	03
2		Minor (03 credits)	
2.A.a	PUF201103	Precalculus	03
3		General Elective (GE)/ Open Elective (OE) (03 Credits)	
3.A.a	PUF301104	Web Technology	03
4		Vocational & Skill Enhancement Courses(VSEC) (02 credits)	
4.A		Skill Enhancement Course	
4.A.a	PUB401105	Office Automation	02
5		Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System (08 credits)	
5.A		Ability Enhancement Course(AEC)	
5.A.a	PUB501106	Language & Literature-I	03
5.B		Value Enhancement Course (VEC)	
5.B.a	PUF501106	Computer Application	03
5.C		Indian Knowledge System (IKS)	
5.C.a	PUA501109	Indian traditional approach in conservation and sustainability	02
TOTAL		CUMULATIVE CREDITS	22

Exit option at the end of the first year (on completion of semester I and semester II):

Under Graduate Certificate in **Data Science and Analytics** will be awarded to a learner on fulfilment of the following conditions:

1. The learner should have acquired 44 credits in Semester I and II considered together.
2. The learner should acquire an additional 4 credits as per norms by completing recognized courses under the National Skill Qualification Framework (NSQF) such as a certificate course on Introduction to Cyber security, a Course on computer concepts, and an Internship.

SEMESTER-I

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

1.Major

1.A. Data Science & Analytics -I

1.A. a Introduction to Programming (3 Credits)

Semester I

1.Major	
1. A . Data Science &Analytics -I	
1.A.a Introduction to Programming	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Learn Programming fundamentals using Python
CObj 2	Understand the concepts and usage data types, variables, operators and Control statement
CObj 3	Learn about using arrays, strings, lists and Dictionaries.
CObj 4	Learn about Numpython and Pandas in Python.
Course Outcomes	
COOut 1	Learner will able to apply various data types including, string, array list,tuple and dictionary.
COOut 2	Learners will able to use regular expressions to perform complex operations in less code.
COOut 3	Learners will able to Work with user input to create function and interactive programs.
COOut 4	Learners will able to build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions.
COOut 5	Learners will able to use Arrays in Data structures.
COOut 6	Learners able to understand and interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
COOut 7	Learners will able to apply to implement Loops ,break and continuous statement for Python Programs
COOut 8	Learners will apply the use of functions and represent Compound data using Lists, Tuples and Dictionaries
COOut 9	Learners will able to use Numpy concepts in Python program
COOut 10	Learners will apply data manipulation with Pandas

Modules at a Glance

Introduction To Programming		
Sr.No	Modules	No. of Lectures
1	Introduction to Python Language:	15
2	Control Statements, Functions, Arrays, Strings:	15
3	Lists and Tuples, Dictionaries, Regular Expressions, NumPy, Pandas	15
Total		45

Sr. No.	Modules	No. of Lectures
1	Introduction to Python Language:	15
	<p>Overview, Features of Python, Execution of a Python Program, Innards of Python, Frozen Binaries, Python Interpreter, Comparison of Python with C and Java, Installing Python, Writing & Executing, IDLE</p> <p>Data Types, Variables And Other Basic Elements: Comments, Docstrings, Data types-Numeric, Compound, Boolean, Dictionary, Sets, Mapping, Basic Elements of Python, Variables</p> <p>Input and Output Operations: Input Function, Output Statements, Command Line Arguments</p> <p>Operators: Arithmetic operators, Assignment operators, Unary minus operator, Relational operators, Logical operators, Bitwise operators, Membership operators, Identity operators, Precedence of Operators, Associativity of Operators</p>	
2	Control Statements, Functions, Arrays, Strings:	15
	<p>Control Statements, Loop Statement, break Statement, continue Statement, return Statement</p> <p>Functions: Defining & Calling a Function, Returning Results, Returning Multiple Values, Built-in Functions, Parameters and Arguments, Recursive Functions, Anonymous or Lambda Functions</p> <p>Arrays: Creating Arrays, Indexing and Slicing, Basic Array Operations, Arrays Processing, Mathematical Operations on Array, Aliasing Arrays, Slicing and Indexing in NumPy Arrays, Basic Slicing. Advanced Indexing. Dimensions of Arrays, Attributes of an Array</p> <p>Creating Strings, Functions of Strings, Working with Strings, Length of a String, Indexing & Slicing, Repeating & Concatenation of Strings, Checking Membership, Comparing Strings, Removing Spaces, Finding Substrings, Counting Substrings, Strings are Immutable, Splitting and Joining Strings, Changing Case, Checking Starting and Ending of a String, Sorting & Searching in the Strings, Formatting the Strings, Working with Characters</p>	

3	Lists and Tuples ,Dictionaries, Regular Expressions, NumPy, Pandas:	15
	<p>Lists, List Functions and Methods, List Operations, Tuples</p> <p>Dictionaries: Creating a Dictionary, Operators in Dictionary, Dictionary Methods, Using for Loop with Dictionaries, Operations on Dictionaries, Ordered Dictionaries</p> <p>Regular Expressions: What is a Regular Expression? Sequence Characters in Regular Expressions, Quantifiers in Regular Expressions, Special Characters in Regular Expressions, Using Regular Expression on Files, Retrieving Information from an HTML File.</p> <p>Introduction to NumPy: Understanding Data Types in Python, The Basics of NumPy Arrays, Computation on NumPy.</p> <p>Data Manipulation with Pandas: Introducing Pandas Objects, Data Indexing and Selection, Operating on Data in Pandas</p>	
Total No. of Lectures:		45

Practical Work (20 Marks)

Practical To be Conducted	
1	Introduction to Python Language
a	Write a Python program to explore various data types including numeric types, Boolean types and compound types.
b	Write a Python program to perform Input and Output Operations.
c	Write a Python program to demonstrate looping in python and use of break statement and continue statement
2	Functions
a	Write a Python program to define and use functions
b	Write a Python program to demonstrate the use of Built-in Functions.
c	Write a Python Program to implement Lambda Functions.
3	Arrays and String
a	Write a Python Program to implement arrays for storing homogeneous data items. Apply indexing and slicing operations to access elements of array.
b	Write a Python Program to demonstrate operations and properties of string data types.
c	Write a Python Program implement and demonstrate the use of Membership operators and Identity operators
	Write a Python Program to implement Numpy for handling multidimensional arrays.
4	List and Tuples
a.	Write a Python Program to create list, apply various functions to it.
b	Write a Python Program to demonstrate concept of aliasing and cloning.
c	Write a Python Program to implement tuples for storing data. Verify the immutability property on tuples.
5	Dictionaries and Sets
a.	Write a Python Program to implement Dictionary and operations on dictionaries
b	Write a Python Program to create sets and various operations on it.

Question Paper Pattern (Academic Year: 2023-2024)

Introduction to Programming

Semester End Examination and Practical Examination – 100 Marks

SEMESTER I

A] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60
Duration : 2 Hours
Note: 1.All questions are compulsory
1.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-2	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-3	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
	Total		60

B] Practical Examination -40 Marks

A Certified copy journal is essential to appear for the practical examination.

1.	Practical Work	20
2.	Journal	10
3.	Viva Voce	10

Books and References:					
Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Programming through Python	M. T. Savaliya, R.KMaurya, G.MMagar	Staredu Solutions	1	2018
2.	Python Data Science Handbook	Jake VanderPlas	O'Reilly Media	1	2016
3.	Let Us Python	Y. Kanetkar,	BPB	1	2019
4.	Programming in Python3	Mark Summerfield	Pearson Education	2	2018
5.	Learning Python	Lutz M	O'Reilly-Shroff	5	2013
6.	Beginning Python	Magnus Lie Hetland	Apress	2	2009
7.	Star Python	Star Certification	Star Certification	1	2018

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

1.Major

1. A. Data Science & Analytics -I

1.A.b Descriptive Statistics (3 Credits)

Semester I

1.Major	
1.A Data Science & Analytics -I	
1.A.b Descriptive Statistics	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To use graphical techniques as well as to compute various measures of central tendency, measures of dispersion, skewness and kurtosis and to calculate range of variables and the deviation of specific data point.
CObj 2	To compute the correlation coefficient for bivariate data and calculate the simple linear regression equation for a set of data, and understand multiple linear regression
CObj 3	To make students analyze and interpret time-dependent data in order to make informed business and economic decisions.
Course Outcomes	
COut 1	Learners will be able to understand the role of statistics
COut 2	Learner will be able to analyse how to organize and summarize data using appropriate graphical and numerical techniques.
COut 3	Learners will be able to apply measures of central tendency and measure of dispersion with use of graphical and numerical techniques
COut 4	Learners will be able to understand various measures of skewness and kurtosis.
COut 5	Learners will be able to develop a clear understanding of correlation as a measure of the strength and direction of the linear relationship between two variables.
COut 6	Learners will be able to perform simple linear regression analysis, including estimating the regression equation, interpreting the coefficients, and making predictions based on the regression model.
COut 7	Learners will be able to apply statistical software or programming languages to perform regression analysis
COut 8	Learners will be able to understand concepts of Multiple regression
COut 9	Learners will be able to understand patterns, trends, and dependencies within historical data in order to make forecasts and informed decisions about future events or phenomena
COut 10	Learners will be able to understand how to build and interpret time series models, such as autoregressive integrated moving average (ARIMA) models, seasonal ARIMA (SARIMA) models, and exponential smoothing models.

Modules at a Glance

Descriptive Statistics		
Sr. No	Modules	No.of Lectures
1	Introduction to statistics	15
2	Correlation and regression	15
3	Time series analysis	15
Total		45

Sr. No.	Modules	No. of Lectures
1	Introduction to statistics	15
	Statistics, what is descriptive statistics Measures of dispersion (Mean, median mode) Measures of central tendency (variance, Std. Dev) Quartiles, Deciles, percentiles, Skewness, kurtosis Graphical representations	
2	Correlation and regression	15
	Correlation- Scatter plot, Types of correlation (spurious, Karl pearson , Spearman rank) Regression- Simple linear regression and its properties, method of least square Introduction to multiple regression	
3	Time series analysis	15
	Introduction to time series and forecasting Method of moving average, method of least square, method of Exponential smoothing Estimation of seasonal component ARMA & ARIMA model	
Total No. of Lectures:		45

Practical Work (20 Marks)

Practical to be done using Excel	
1	Introduction to excel :- Understating data tools, Ribbon, Tabs, Add-ins
2	Formula :- summary statistics
3	Graphical representations and interpretation
4	Find the correlation between two data sets
5	Perform regressional analysis
6	Understand the difference and importance between MA and AR model
7	Data Validation
8	Lookup functions , Pivot table and chart

Question Paper Pattern (Academic Year: 2023-2024)

Descriptive Statistics

Semester End Examination and Practical Examination – 100 Marks

SEMESTER I

A] Semester End Examination (SEE)- 60 Marks

Maximum Marks 60
Duration : 2 Hours

Note: 1.All questions are compulsory
1.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question E. Numerical / Case study-based question	25	20
Q-2	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question A. E. Numerical / Case study-based question	25	20
Q-3	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question A. E. Numerical / Case study-based question	25	20
	Total	75	60

B]Practical examination - 40 Marks

A Certified copy journal is essential to appear for the practical examination.

1.	Practical Work	20
2.	Journal	10
3.	Viva Voce	10

Books and References				
Sr.No	Title	Authors	Publishers	Edition
1.	Statistical Methods, An Introductory Text,	Medhi J.	New Age International Ltd.	Second Edition
2.	Basic Statistics	Agarwal B.L.	New Age International Ltd.	
3.	Theory and Problems of Statistics,	Spiegel M.R.	Tata McGraw-Hill.	
4.	Fundamentals Of Statistics, Volume II	Goon A.M., Gupta M.K., Dasgupta B.	The World Press Private Limited, Calcutta.	
5.	Complete Business Statistics	Aczel Sounderpandian	Tata McGraw Hill	
6.	Excel Data Analysis Modeling and simulation	Hector Gurrero	Springer	Second Edition
7.	Data Analysis And Decision Making	Albright, Wilston, Zappe	Thomson	
8	Statistics for business and economics	Paul Newbold, William L. Carlson, Betty Thorne	Pearson	10 Edition

**Syllabus of courses of FY BSc (Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

2. Minor

2A.a. Precalculus (3 Credits)

Semester I

2.Minor	
2A.a. Precalculus	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To master the number fundamentals, equations and different types of mathematical functions
CObj 2	To review and explain the Exponential and Logarithmic Functions.
CObj 3	To understand Polar Coordinates and Parametric Equation.
Course Outcomes	
COut 1	Learner will apply the knowledge of numbers, graph and functions in real life.
COut 2	Learners will able to Identify and evaluate functions
COut 3	Learners able to Evaluate Exponential functions and Graph exponential functions
COut 4	Learner able to apply Exponential and Logarithmic functions in real life problems.
COut 5	Learners will able to understand Trigonometric Functions
COut 6	Learners will able to evaluate sine and cosine functions
COut 7	Learners able to Identify and use polar coordinates
COut 8	Learners able to evaluate the polar form of complex numbers
COut 9	Learners able to understand concepts of Vectors
COut 10	Learners able to Understand concepts of Conic section.

Modules at a Glance

Precalculus		
Sr.No	Modules	No. of Lectures
1	Fundamentals	15
2	Exponential and Logarithmic Functions	15
3	Polar Coordinates and Parametric Equations	15
Total		45

Sr. No.	Modules	No. of Lectures
1	Fundamentals:	15
	Real Numbers, Exponents and Radicals, Algebraic Expressions, Rational Expressions, Equations, Modeling with Equations, Inequalities, Coordinate Geometry, Making Models Using Variation. Functions: What is function? Graphs of Functions, Getting Information from the Graph of a Function, Average Rate of Change of a Function, Transformations of Functions, Combining Functions, One-to-One Functions and Their Inverses. Polynomial and Rational Functions: Quadratic Functions and Models, Polynomial Functions and Their Graphs, Dividing Polynomials, Real Zeros of Polynomials, Complex Numbers, and Complex Zeros and the Fundamental Theorem of Algebra, Rational Functions.	
2	Exponential and Logarithmic Functions	15
	Exponential Functions, The Natural Exponential Function, Logarithmic Functions, Laws of Logarithms, Exponential and Logarithmic Equations, Modelling with Exponential and Logarithmic Functions. Trigonometric Functions: Unit Circle Approach: The Unit Circle, Trigonometric Functions of Real Numbers, Trigonometric Graphs, Inverse Trigonometric Functions and Their Graphs Trigonometric Functions: Right Triangle Approach: Angle Measure, Trigonometry of Right Triangles, Trigonometric Functions of Angles, The Law of Sines, The Law of Cosines. Analytic Trigonometry: Trigonometric Identities, Addition and Subtraction Formulas, Double-Angle, Half-Angle, and Product-Sum Formulas	

3	Polar Coordinates and Parametric Equations:	15
	Polar Coordinates, Graphs of Polar Equations, Polar Form of Complex Numbers; De Moivre’s Theorem, Plane Curves and Parametric Equations Vectors in Two and Three Dimensions: Vectors in Two Dimensions, The Dot Product, Three-Dimensional Coordinate Geometry, Vectors in Three Dimensions, The Cross Product, Equations of Lines and Planes Conic Sections: Parabolas, Ellipses, Hyperbolas Limits: Finding Limits Numerically and Graphically, Finding Limits Algebraically, Tangent Lines and Derivatives	
Total No. of Lectures:		45

Question Paper Pattern (Academic Year: 2023-2024)
Precalculus
Internal Examination and Semester End Examination – 100 Marks
SEMESTER I

A) Internal Examination – 40 Marks

Method of evaluation	Total marks
Class Test -I	20
Class Test -II	20
TOTAL	40

B) Semester End Examination (SEE)- 60 Marks

Maximum Marks

60

Duration

: 2 Hours

Note: 1. All questions are compulsory

2. All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question E. Numerical / Case study-based question	25	20
Q-2	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question E. Numerical / Case study-based question	25	20
Q-3	Attempt any four from the following. A. Numerical / Case study-based question B. Numerical / Case study-based question C. Numerical / Case study-based question D. Numerical / Case study-based question E. Numerical / Case study-based question	25	20
Total		75	60

Books and References:

Sr. No.	Title	Author/s	Publisher	Year
1.	Precalculus–Mathematics for Calculus	James Stewart, Lothar Redlin, Saleem Watson	Cengage Learning	2013
2.	Precalculus Demystified	Rhonda Huettenmueller	Tata McGrawHill	2005
3.	Contemporary Precalculus: A Graphing Approach	Thomas W. Hungerford, Douglas J. Shaw	Thomson Higher Education	2009
4.	Precalculus	David H. Collingwood, K.David Prince, Matthew M. Conroy	Free Software Foundation	2011

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

3.General Elective / Open Elective

3.A.a Web Technology (3 Credits)

Semester I

3.General Elective /Open Elective	
3.A.a Web Technology	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	Introducing the basic concepts of Internet ,web design and HTML5 to learners
CObj 2	Giving insight of the Page layout and navigation with HTML5.
CObj 3	Making students aware about use of Tables, Forms and Media with HTML5.
CObj 4	Providing knowledge of web page design using CSS and giving knowledge of JavaScript.
Course Outcomes	
COut 1	Learners will able to understand the use of HTML5 concepts
COut 2	Learners will able to understand and use the Page layout, Navigation features of HTML5.
COut 3	Learners able to understand and use of Tables, Forms and Media features of HTML5.
COut 4	Learners able to understand and use Cascading Style sheet for the web pages.
COut 5	Learners will understand graphics concepts in HTML5
COut 6	Learners able to understand the basic requirement of webdesign
COut 7	Learner will analyze a web page and identify its elements and attributes
COut 8	Learners will able to understand JavaScript Language programming concepts and techniques

Modules at a Glance

Web Technology		
Sr.No	Module	No .of Lectures
1	Introduction to Internet	15
2	HTML 5	15
3	Introduction to Style sheet and Javascrpts	15
Total		45

Sr. No.	Modules	No. of Lectures
1	Introduction to Internet:	15
	<p>Internet and the World Wide Web: What is Internet? Introduction to internet and its applications, E-mail, telnet,FTP, e-commerce, video conferencing, e-business. Internetservice providers, domain name server, internet address, World Wide Web (WWW): World Wide Web and itsevolution, uniform resource locator (URL), browsers –internet explorer, Netscape navigator, opera, Firefox,chrome, Mozilla. search engine, web saver – apache, IIS,proxy server, HTTP protocol What Is Web Design?: Defining Web Design, Web Design Themes, Learning Web Design. User-Centered Design: Usability, Who Are Web Users? Common User Characteristics, Memory, Response and Reaction Times, Dealing with Stimulus, Movement Capabilities, The User’s World, General Types ofUsers, Web Conventions, Accessibility, Building a Usable Site HTML5:Introduction, Why HTML5? Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors.</p>	
2	HTML 5:	15
	<p>HTML5 Page layout and navigation: Creating navigational aids: planning site organization, creating text based navigation bar, creating graphics based navigation bar, creating graphical navigation bar, creating image map, redirecting to another URL, creating division basedlayouts:HTML5 semantic tags, creating divisions, creating HTML5 semantic layout, positioning and formatting divisions. HTML5 Tables, Forms and Media: Creating tables: creating simple table, specifying the size of the table, specifying the width of the column,merging table cells, using tables for page layout, formatting tables: applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user</p>	

	forms: creating basic form, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page.	
3	Introduction to Style Sheets and Java Script	15
	<p>Understanding Styles, Constructing Style Rules, Creating Styles for Nested Tags, Creating Classes and IDs for Applying Styles, Applying Styles to Hyperlinks, Creating and Linking to External Style Sheets</p> <p>Formatting Text by Using Style Sheets: Specifying a Font Family, Specifying a Font Size and Color, Applying Bold and Italics, Applying Strikethrough and Underlining, Creating Inline Spans , Adjusting Spacing Between Letters</p> <p>Formatting Paragraphs by Using Style Sheets: Indenting Paragraphs, Applying a Border to a Paragraph, Specifying a Border Style, Setting Border Padding, Specifying Border Width and Color, Formatting Border Sides Individually, Setting All Border Attributes at Once, Specifying the Horizontal Alignment of a Paragraph, Specifying Vertical Space within a Paragraph</p> <p>Displaying Graphics: Selecting a Graphics Format, Preparing Graphics for Web Use, Inserting Graphics, Arranging Elements on the Page, Controlling Image Size and Padding, Hyperlinking from Graphics, Using Thumbnail Graphics, Including Alternate Text for Graphics, Adding Figure Captions</p> <p>Java Script: Introduction, Client- Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security</p> <p>Core JavaScript (Properties and Methods of Each) : Array, Boolean, Date, Function, Math, Number, Object, String, RegExp Document and its associated objects: document, documentobject methods, Link, Area, Anchor, Image, Layer</p>	
Total No. of Lectures:		45

Practical Work (20 Marks)

List of Practical:	
1.	Use of Basic Tags:
a.	Design a web page using different text formatting tags.
b.	Demonstrate use of Font tag with its attributes and HTML various color options in web page.
c.	Design a web page with links to different pages and allow navigation between web pages.
2.	Navigation, list and paragraph:
a.	Design a web page to demonstrate text-based navigation bar.
b.	Demonstrate use of lists and backgrounds in web page.
c.	Demonstrate use of paragraph and its associated tags in web page.
3.	Lists, images and semantics:
a.	Demonstrate use of multiple image tag in web page.
b.	Design a web page with Imagemaps.
c.	Design a web page demonstrating use of various semantics tags
4.	Multimedia and User controls:
a.	Design a web page with a form that uses all types of user controls.
b.	Design a web page embedding with multimedia features.
c.	Design a 3 page static website with appropriate tags and attributes.
5.	CSS with list, links and table:
a.	Create and use different style rules with available types of lists.
b.	Create and use different style rules with hyperlinks.
c.	Create and use different style rules with tables.

Question Paper Pattern (Academic Year: 2023-2024)

Web Technology

Semester End Examination and Practical Examination – 100 Marks

SEMESTER I

A] Semester End Examination (SEE)- 60 Marks

Maximum Marks **60**

Duration : 2 Hours

Note: 1.All questions are compulsory

2.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-2	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-3	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
	Total		60

B] Practical Examination - 40 Marks

A Certified copy journal is essential to appear for the practical examination.

1.	Practical Work	20
2.	Journal	10
3.	Viva Voce	10

Books and References:				
Sr. No.	Title	Author/s	Publisher	Year
1.	HTML5 Step by Step	Faithe Wempen	Microsoft Press	2011
2.	Web Design The Complete Reference	Thomas Powell	TMH	2009
3.	Head First HTML 5 programming	Eric Freeman	O'Reilly	2013

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

4. Vocational & Skill Enhancement Courses (VSEC)

4.A Skill Enhancement Course

4.A.a.Office Automation Course I (2 Credits)

Semester I

4. Vocational & Skill Enhancement Courses (VSEC)	
4.A Skill Enhancement Course	
4.A.a Office Automation	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	To build an understanding of how to use excel from scratch and then gradually scale up to higher levels of competence
Cobj 2	To equip the students with MS Excel features which will develop their foundation of using spreadsheets
Cobj 3	To provide insights into the data analysis tools in Excel so that they can extract meaningful information from vast arrays of data
Cobj 4	To familiarize students with the important functions and data visualization features available in Excel which help in performing data mining
Course Outcomes	
Cout 1	The learner can prevent unintended or malicious intrusions over the workings.
Cout 2	The learners are able to assign validations and protections excel based templates and Files
Cout 3	Learners are able to create Pivot Tables and Pivot Charts
Cout 4	The learner acquires knowledge about Conditional formatting
Cout 5	The learners can analyze Charts of various kinds
Cout 6	Learners is able to analyze more about Data Validation
Cout 7	The learner knows how to Protect Workbook and Worksheet
Cout 8	The learner learns to assign read /write access passwords to files
Cout 9	Learner creates and opens workbooks
Cout 10	The learner is aware of modification of columns, rows and cells

Module at Glance

Office Automation		
Sr.No	Module	No .of Lectures
1	Introduction to Excel	10
2	Essential Functions	10
3	Data Analysis, validation and Visualizations	10
Total		30

Sr. No.	Modules	No. of Lectures
1	Introduction to Excel	10
	<ul style="list-style-type: none"> • Creating and opening workbooks • Cell basics • Modifying columns, rows and cells • Worksheet basics • Introduction to formulas Freeze Panes <ul style="list-style-type: none"> • Formatting features of cells • Sort • Filters • Fill Handle • Copy a sheet • Find and Replace • Relative and Absolute Cell Referencing • Text to columns • Paste Special • Subtotals • Comments 	
2	Essential Functions	10
	<ul style="list-style-type: none"> • Sum, Count, Min, Max, Average, Median, Subtotal • Date, Today, Now • If, And, Or • Vlookup and Hlookup • Round, Roundup and Rounddown • Sumif and Sumifs • Countif and Countifs • Averageif and Averageifs • Concatenate and Trim 	
3	Data Analysis, validation and Visualization	10
	<ul style="list-style-type: none"> • Pivot Tables and Pivot Charts • Remove Duplicates • Conditional formatting • Charts of various kinds 	

	<ul style="list-style-type: none"> • Data Validation • Protect Workbook • Protect Worksheet • Assigning read /write access passwords to files 	
Total No. of Lectures:		30

Question Paper Pattern (Academic Year: 2023-2024)

Office Automation

Internal Examination and Semester End Examination – 50 Marks

SEMESTER I

A] Internal Examination – 20 Marks

Method of evaluation	Total marks
Practical work	20
TOTAL	20

B] Semester End Examination (SEE)- 30 Marks

Maximum Marks **30**
Duration **: 1 Hours**
Note: 1.All questions are compulsory
2.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)
Q-1	Attempt any one from the following. A. Full length question. B. Full length question	10
Q-2	Attempt any one from the following. A. Full length question. B. Full length question	10
Q-3	Attempt any two from the following. A. Short answer. B. Short answer C. Short answer D. Short answer.	10
	Total	30

Books and References

Sr.No	Book Title	Author Name	Publisher
1	Slaying Excel Dragons	Mike Girvin	Holy Macro! Books
2	Ctrl+Shift+Enter Mastering Excel Array Formulas	Mike Girvin	Holy Macro! Books
3	Excel for Beginners (Excel Essentials Book 1)	M.L. Humphrey	Independently Published

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

5. Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System

5.A. Ability Enhancement Course

5.A.a. Language & Literature -I (3 Credits)

Semester I

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System	
5.A Ability Enhancement Course (AEC)	
5.A.a Language and Literature-I	
Course Objectives and Course Outcomes	
Course Objectives	
Cobj 1	To understand the effective use of power point presentation, relevance and importance of interpersonal communication skills
Cobj 2	To enhance written communication skills
Cobj 3	To enable the learners to adapt to the requirements of the industry.
Course Outcomes	
Cout 1	The learners learn to use statistical tools in PowerPoint presentations, write letters of enquiry and letters of complaint.
Cout 2	Practical application of preparing flyers and leaflets help the learners demonstrate their creativity.
Cout 3	Nonverbal communication skills of learners are enhanced.
Cout 4	The learner is able to analyze the components of letter writing
Cout 5	Learners can understand the theories of communication
Cout 6	Learners can differentiate between the different modes of communication
Cout 7	Learners is trained to apply ethics at work place
Cout 8	Learners is able to create a resume and face job interviews with ease
Cout 9	Learners can relate to the barriers of communication and are able to cope with the same
Cout 10	Learners can apply the most appropriate and effective mode of communication

Module at Glance

Language & Literature I		
Sr.No	Module	No .of Lectures
1	Theory of Communication & Obstacles to Communication in Business World	15
2	Business Correspondence	15
3	Language and Writing Skills	15
Total		45

Sr. No.	Modules	No. of Lectures
1	Theory of Communication & Obstacles to Communication in Business World	15
	<p>Concept of Communication: Meaning, Definition, Process, Need, Feedback Emergence of Communication as a key concept in the Corporate and Global world Impact of technological advancements on Communication Channels and Objectives of Communication: Channels- Formal and Informal- Vertical, Horizontal, Diagonal, Grapevine Objectives of Communication: Information, Advice, Order and Instruction, Persuasion, Motivation, Education, Warning, and Boosting the Morale of Employees (A brief introduction to these objectives to be given) Methods and Modes of Communication: Methods: Verbal and Nonverbal, Characteristics of Verbal Communication Characteristics of Non-verbal Communication, Business Etiquette Computers and E- communication: Organizing and use of Video and Satellite. Problems in Communication /Barriers to Communication: Physical/ Semantic/Language / Socio-Cultural / Psychological /Barriers, Ways to Overcome these Barriers Listening: Importance of Listening Skills, Cultivating good Listening Skills Introduction to Business Ethics: Concept and Interpretation, Importance of Business Ethics.</p>	
2	Business Correspondence	15
	<p>Theory of Business Letter Writing: Parts, Structure, Layouts— Full Block, Principles of Effective Letter Writing, Principles of effective Email Writing, Personnel Correspondence: Statement of Purpose, Job Application Letter and Resume, Letter of Acceptance of Job Offer, Letter of Resignation [Letter of Appointment, Promotion and Termination, Letter of Recommendation</p>	

3	Language and Writing Skills	15
	<p>Commercial Terms used in Business Communication Paragraph Writing: Developing an idea, using appropriate linking devices, etc Cohesion and Coherence, etc [Interpretation of technical data, Composition on a given situation, a short informal report & improvisation Activities] Listening, Comprehension, Speaking Skills: Presenting a News Item, Dialogue and Speeches Paragraph Writing: Preparation of the first draft, Revision and Self Editing, Rules of spelling. Reading Comprehension: Analysis of texts from the fields of Commerce and Management</p>	
Total No. of Lectures:		45

Question Paper Pattern (Academic Year: 2023-2024)

Language & Literature -I

Internal Examination and Semester End Examination – 100 Marks

SEMESTER I

A] Internal Examination – 40 Marks

Method of evaluation	Marks
Activity in Language lab	20
Translation of newspaper article	20
TOTAL	40

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks **60**

Duration : 2 Hours

Note: 1.All questions are compulsory

2.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-2	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-3	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
	Total		60

Reference Books

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2. Alien, R.K.(1970) Organisational Management through Communication. Podar : Nurturing Intellect Creating Personalities
3. Ashley,A(1992) A Handbook Of Commercial Correspondence, Oxford University Press.
4. Aswathapa, K (1991)Organisational Behaviour, Himalayan Publication, Mumbai.
5. Atreya N and Guha (1994) Effective Credit Management, MMC School of Management, Mumbai.
6. Bahl,J.C. and Nagamia,S.M. (1974) Modern Business Correspondence and Minute Writing.
7. Balan,K.R. and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi.
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9. Banerjee, Bani P (2005) Foundation of Ethics in Mangement Excel Books 10.Businessworld Special Collector's Issue: Ethics and the Manager
10. Barkar, Alan(1993) Making Meetings Work, Sterling Publications Pvt. Ltd., New Delhi.
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12. Benjamin, James (1993) Business and Professional Communication Concepts and Practices, Harper Collins College Publishers, New York.
13. Bhargava and Bhargava91971) Company Notices, Meetings and Regulations
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15. BoveeCourtland,L and Thrill, John V(1989) Business Communication, Today McGraw Hill, New York, Taxman Publication.
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19. Drucher,P.F.(1974)Management Responsibilities Practices, Heinemann, London. 22.Eyre, E.C. (1985) Effective Communication Made Simple, Rupa and Co.Calcutta
20. Ecouse Barry, (1999), Competitive Communication: A Rhetoric for Modern Business, OUP.
21. Ecouse Barry, (1999), Competitive Communication: A Rhetoric for Modern Business, OUP.
22. Fisher Dalmar, (1999), Communication in Organisation, Jaico Pub House, Mumbai, Delhi.
23. Frailley, L.E. (1982) Handbook of Business Letters, Revised Edn. Prentice Hall Inc.
24. French, Astrid (1993) Interpersonal Skills. Sterling Publishers, New delhi.
- 25.Fritzsche, David J (2005) Business Ethics: A Global and Managerial Perspective McGraw Hil

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)**

5. Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System

5.B. Value Enhancement Course

5.B.a. Computer Application (3 Credits)

Semester I

5. Ability Enhancement Course, Value Enhancement Course, Indian Knowledge System	
5.B. Value Enhancement Course	
5.B.a. Computer Application	
Course Objectives and Course Outcomes	
Course Objectives	
Cobj 1	To impart knowledge in concepts and components of Data Communications and Networking
Cobj 2	To understand the basic concepts of data communication, layered model, protocols and inter- working between computer networks and switching components in telecommunication systems
Cobj 3	To understand use of Internet in business and Ms Office
Course Outcomes	
Cout 1	Learners will able to understand basic concept of Data Communications
Cout 2	Learners will able to understand basic concept of Networks and Infrastructure
Cout 3	Learners will able to understand basic concept of Networks and Protocols.
COut 4	Learners will able to apply various network application such as data transmission between clientand server, file transfer, real-time multimedia transmission.
COut 5	Learners will apply different internet in business sectors
COut 6	Learners will able to understand concepts of MS Word
COut 7	Learners will able to create power slides for power point presentation using techniques of MS power point
COut 8	Can work with I.T Firm

Module at Glance

Computer Application		
Sr.No	Modules/Units	No. of Lectures
1	Data Communication, Networking	15
2	Internet	10
3	MS Word and Power point	20

Sr. No.	Modules	No. of Lectures
1	Data Communication and Networking	15
	Data Communication Component Data representation Distributed processing Network Basics and Infrastructure Network Models LAN, MAN, WAN Network Hardware: Hubs, Bridges, Switches, and Routers Network Structures – Server Based, Client server, Peer to Peer Topologies – Star, Bus, Ring. Network Protocols – TCP /IP, OSI Model	
2	Internet	10
	Definition, Types of connections, Services on net- WWW, Email-BlogsIP addresses, Domain names, URLs, Hyperlinks, Web Browsers Cyber Crime, Hacking, Sniffing, Spoofing	
3	MS Word	20
	Learning Word Creating /Saving of Document Editing and Formatting Document Designing a title page Preparing Index Use of SmartArt Cross Reference, Bookmark and Hyperlink.Mail MergeFeature. MS Power point Creating a presentation with minimum 20 slides with a script. Presenting in different views,Inserting Pictures, Videos, Creating animation effects on them Slide Transitions, Timed PresentationsRehearsal of presentation	
Total No. of Lectures:		45

Question Paper Pattern (Academic Year: 2023-2024)

Computer Application

Internal Examination and Semester End Examination – 100 Marks

SEMESTER I

A] Internal Examination – 40 Marks

Method of evaluation	Total marks
Class Test -I	20
Class Test -II	20
TOTAL	40

B] Semester End Examination (SEE)- 60 Marks

Maximum Marks **60**
Duration : 2 Hours
Note: 1.All questions are compulsory
 2.All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)	Marks (To Be Attempted)
Q-1	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-2	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
Q-3	Answer the following questions (Any 4)		
	A. Theory/Concept-based question	5	20
	B. Theory/Concept-based question	5	
	C. Theory/Concept-based question	5	
	D. Theory/Concept-based question	5	
	E. Theory/Concept-based question	5	
	Total		60

Books and Reference

Sr. No.	Title	Author/s
1.	Data Communication and Networking	Behrouz A Forouzan
2.	Introduction to Computers	Peter Norton

**Syllabus of courses of FY BSc(Data Science & Analytics) Programme
(With effect from the Academic Year 2023-2024)
Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System
5.C Indian Knowledge System (IKS)
5.C.a. Indian traditional approach in conservation and sustainability (2 Credits)
Semester I**

5. Ability Enhancement Courses, Value Enhancement Course, Indian Knowledge System	
5.C Indian Knowledge System (IKS)	
5.C.a. Indian traditional approach in conservation and sustainability	
Course Objectives and Course Outcomes	
Course Objectives	
CObj 1	The course will enable the learner to understand the scientific and moral value of traditional ancient Indian knowledge.
CObj 2	The course is expected to convert the ancient wisdom to the applied aspects of the modern scientific paradigm.
CObj 3	The course is expected to create interest and excitement in the learner to explore more on the specific area of knowledge.
CObj 4	The course is expected to empower the learner to inspire others in learning our own traditional practices of sustainability.
CObj 5	The course is expected to develop the interest in the learner to do further research in the specific area of knowledge.
Course Outcomes	
COut 1	The learners shall be able to acknowledge the contribution of traditional Indian wisdom in various commercial fields.
COut 2	The learner should be able to draw connections between the trade & commercial activities along with their influence on the environment and the efforts to address the same.
COut 3	The learners shall be able to identify traditional eco-friendly options for current modes of transportation.
COut 4	The learner should be able to understand the ancient practices of resource conservation and to have a holistic approach towards sustainable development in modern times.
COut 5	The learners should be able to analyze the current practices of land management with respect to ancient Indian practices for the conservation of the same.
COut6	The syllabus shall enable the learners to correlate the conventional practices of water conservation with special reference to ancient wisdom in the same regards.
COut 7	The learners shall be able to suggest measures for forest conservation through various ancient Indian solutions.
COut 8	The learners should be able to evaluate the Indian contribution in various contemporary fields of social sciences and technologies
COut 9	The learners should be able to describe the case studies to illustrate the significant contribution of Indian scholars in various conventional fields of social sciences.
COut 10	The learners should be able to examine the future perspectives and possibilities of various aspects of the Indian Knowledge System to enrich the society

Modules at a Glance

Indian traditional approach in conservation and sustainability		
Sr. No.	Modules	No. of Lectures
1	Conventional trade & commerce and environment	15
2	Resource conservation and sustainability	15
3	Significant Indian contributions to the world	Internal component/ assessment
Total No. of Lectures:		30

Sr. No.	Modules
1	Conventional trade & commerce and environment
	<p>A. Introduction and overview of Indian Knowledge System. Indian disciplinary knowledge system in different fields like, architecture, science & technology, nature, astronomy, agriculture, health & medicine, Defense (case study of Rani Abbakka Chowta who defeated Portuguese)</p> <p>B. Traditional commercial activities & trade practices with reference to environmental conservation: Agricultural trade, Silk, Cotton, Spices, Metallurgy, Textile industry, etc.</p> <p>C. Transportation and its modes: Grand Trunk road, Boat & ship-building, Energy efficiency in the transport sector: a current scenario, Eco mobility. Impact of transport on climate, impact of climate on transport.</p>
2	Resource conservation and sustainability
	<p>A. Land Management & Conservation: Ancient & traditional agricultural activities, Conservation strategies, Harappan civilization-town planning, etc.</p> <p>B. Water Management & Conservation: Harappan civilization, ancient practices of irrigation, Tanks, Lakes, Stepwells, Traditional rain-water harvesting, Community involvement.</p> <p>C. Forest & Wildlife Conservation: Sacred forests, sacred groves, sacred hills, Social forestry, Agroforestry, Animal worshiping, Worshiping natural forces. Women and conservation- Ecofeminism.</p>

3	Significant indian contributions to the world (internal component/assessment)
	<p>A. Contribution in the field of agriculture: Food crops, Cotton, Animal husbandry, etc.</p> <p>B. Contribution in the field of science & technology: Invention of zero, etc.</p> <p>C. Contributions in the field of health & medicine: Ayurveda, Meditation, Yoga, etc.</p> <p>D. Case studies on Indian Knowledge System on any particular/ specific area of knowledge: Ayurveda, Agriculture, Astronomy, Architecture, Economics, Mathematics, Philosophy, Yoga, Medicine, Nature, Politics, Weaponry, Military science, Literature, Poetics or any other area of knowledge. Indian Knowledge System- Future perspectives: Challenges and Opportunities.</p>

**Indian Knowledge System
Question Paper Pattern (Academic Year: 2023-2024)
Internal Examination & Semester End Examination – 50 Marks**

A] Internals-20 Marks

INTERNAL ASSESSMENT: 20 MARKS

MODULE-III is given for internal assessment. Students will be writing assignments on the selected topics.

B] Semester End Examination (SEE)- 30 Marks

Maximum Marks : 30
Duration : 1 Hour

NOTE: 1. All questions are compulsory.
2. All questions carry equal marks

Question No.	Particulars (Nature of Questions)	Marks (Given)
Q-1	Attempt any one of the following. A. Full length question. B. Full length question	10
Q-2	Attempt any one of the following. A. Full length question. B. Full length question	10
Q-3	Attempt any two of the following. A. Short answer. B. Short answer C. Short answer D. Short answer.	10
	Total	30

