

Sheth NKTT College of Commerce and Sheth JTT College of Arts, Thane (Autonomous)
F. Y. B. Sc (Data Science) 2024-25

	Semester I Subjects	Credits		Semester II Subjects	Credits
Major BDI101	Introduction to Programming Using Python	2	BDR201	R-Programming	2
BDD102	Descriptive Statistics	2	BDP202	Probability and Distribution	2
Major BDIDP103	Introduction to Programming Using Python and Descriptive Statistics Practical	2	BDRPP203	R-Programming and Probability and Distribution Practical	2
Minor	-	-	BDC204	Calculus	2
BDA104	OE 1: Basic Accounting and Practices	2	BDF205	1. OE1: Financial Markets	2
BDE105	OE2: Business Economics	2	BDD206	2. OE2: Digital Marketing	2
BDO106	VSC: Object oriented programming	2	BDM207	VSC: Database Management System	2
BDOP107	SEC: Object oriented Programming Practical	2	BDMP208	SEC: Database Management System Practical	2
BDC108	AEC :Corporate Communication- I	2	BDW209	1. AEC :Corporate communication-II	2
BDG109	VEC : Green Technology -I	2	BDG210	2. VEC : Green Technology -II	2
BDK110	IKS : Evolution of IT	2			
BDS1011 BDL1011 BDP1011	1. CC: NSS/ Sports/ Cultural/ Yoga	2	BDS2011 BDL2011 BDP2011	2. CC : NSS/ Sports/ Cultural Yoga	2
	Total	22			22


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Programme Name: B.Sc.(Data Science)	Semester: II
Course Category/Vertical: Major	
Name of the Dept: Science and Technology	
Course Title: R Programming	
Course Code: BDR201	Course Level:4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO): (List the course objectives) CO1: Master the use of the R interactive environment and expanding by installing R packages CO2: Read Structured Data into R from various sources CO3: Import & Export data to & from R CO4: Understand basic graphical function	
Course Outcomes (OC): (List the course outcomes) After completion of the course, learners would be able to: OC1: Understand R Studio and explore the features & functions of R programming OC2: Work with import and use the data and represent the data into tables, manipulating Data Frames & plot the graph using basic graphical function	
Description the course: (Including but not limited to)	R programming is highly relevant in various industries and fields due to its robust statistical and data analysis capabilities. This introductory R programming course insights into its relevance and demand in the industry.

Syllabus: NEP 2020 w.e.f 2024-25

Unit No.	Content	Hours
I	<p>Getting started with R: R Software Getting started: R as a big calculator, Assignment, Basic operators</p> <p>R Interfaces - Example Datasets in R, R Packages, installing new R libraries, Customizing R Start-up</p> <p>Objects in R: Using ls and rm to managing R Objects, Types of R Objects, attributes of object, Creating, accessing, modifying objects</p> <p>Introduction to programming and writing Functions in R: Functions, Conditional statements (if, ifelse, switch), Repetitive execution: For and While loops, The Apply Functions</p>	15
II	<p>Reading and writing data to and from R: Importing and reading text files data into RStudio, Importing data using R command read.table(), Exercise, Importing text files Using scan(), Parsing each line – Redlines, Writing Data table from R, Exercise, Importing Data from other Software, Reading data from Excel into R</p> <p>Introduction to graphics in R: The R function plot(), Customize plot with low-level plotting commands,</p> <p>Advanced Graphics: Advanced plotting using Trellis; ggplots2, Lattice, Examples that Present Panels of Scatterplots using xyplot()</p> <p>Importing Data- readr, Reformatting Tables – tidy, Manipulating Data Frames – dplyr: Selecting Columns, Filter, Sorting, Modifying Data Frames</p>	15
Total Hours		30

References:

1. Introduction to Programming and Statistical Modelling in R, Aedin Culhane, HARVARD SCHOOL, 1st Edition 2013
2. Statistics - An introduction using R. John Wiley, Crawley, M. J. (2006), London
3. R Data Science Quick Reference, Thomas Mailund Apress 1st Edition 2019
4. THE BOOK OF R, Tilman M. Davies No starch press 1st 2016

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ProgrammeName: B.Sc.(Data Science)	Semester: II
Course Category/Vertical: Major	
Name of the Dept: Science and Technology	
Course Title: Probability and Distribution	
Course Code: BDP202	Course Level:4.5
Type: Theory	
Course Credit: 2	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO): (List the course objectives)	
CO1: To explore about random variables and implement various distribution functions, to familiarize with concepts of probability.	
CO2: Learn and implement the concept of expectation, related theorems, to know the concept and implementation of discrete distributions including Bernoulli, Binomial distributions to get acquainted with theory and practical implementation of concepts of continuous distributions.	
Course Outcomes (OC): (List the course outcomes)	
OC1: After completion of the course, a student should be able to use discrete and continuous probability distributions, mean and variance.	
OC2: Understand the concept of Mathematical Expectation and its properties, Different theoretical discrete distributions like Binomial, Bernoulli's, Poisson's and different theoretical continuous distribution like Uniform, Normal, Gamma, and Exponential.	
Description the course: (Including but not limited to)	Probability Distribution is one of the important concept in statistics. It has huge applications in business, Finance Investing science and other sectors. It is majorly used to make future predictions based on a sample for a random experiment.

Syllabus: NEP 2020 w.e.f 2024-25

Unit No.	Content	Hours
I	<p>Theory of Probability: Introduction, History, Different terms Axiomatic approach to probability, Mathematical notation, Independent events, multiplication law and conditional probability, Bayes theorem,</p> <p>Random Variables and Distribution Functions: Random Variable, distribution function, discrete random variable, continuous random variable, joint probability law.</p>	15
II	<p>Mathematical Expectation: Mathematical expectation and its properties, Expectation of a Function of a Random Variable, Addition Theorem of Expectation, Multiplication Theorem of Expectation, Conditional Expectation and Conditional Variance.</p> <p>Theoretical Discrete Distributions: Introduction, Bernoulli Distribution, Binomial Distribution, Poisson Distribution, Discrete Uniform Distribution.</p> <p>Theoretical Continuous Distributions: Rectangular or Uniform Distribution, Normal Distribution, Gamma Distribution, The Exponential Distribution.</p>	15
Total Hours		30

References:

Sr. No.	Title	Author/s	Publisher	Edition
1	Fundamentals of Mathematical statistics	S. C. Gupta and V. K. Kapoor	S. Chand and Sons	Tenth
2	Applied Statistics and Probability for Engineers	Douglas C. Montgomery and George C. Runger	Wiley	Sixth
3	Probability, Statistics, and Stochastic Processes	Peter Olofsson and Mikael Andersson	Wiley	second

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Programme Name: B.Sc(Data Science)	Semester: II
Course Category/Vertical: Major	
Name of the Dept: Science and Technology	
Course Title: R- Programming and Probability & Distribution Practical	
Course Code: BDRPP203	Course Level: 4.5
Type: Practical	
Course Credit: 2	
Hours Allotted: 60 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO): (List the course objectives)	
CO1: Learn and implement expressions & control flow in R	
CO2: Explore and use basic data structures & graphs in R	
CO3: To provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications in engineering and science	
.CO4: To practically learn the theory concepts and apply in real time.	
Course Outcomes (OC): (List the course outcomes)	
After completion of the course, learners would be able to:	
OC1: Use R object, simple statistical function for data analysis.	
OC2: To create Tabulation for presentation of data and operation of them and get the knowledge about various ways of plotting data	
OC3: Course will make students understand to create different formulas to find probability, Conditional probability, Expected mean, variance, and standard deviation, Joint Probability in Excel.	
OC4: Understand how to use and analyze statistical functions to calculate normal, Poisson's, Exponential Distribution by using excel.	

Syllabus: NEP 2020 w.e.f 2024-25

Sr. No.	Content	Hours
I	R-Programming	
1	Introduction to R Programming Elements	
A	Write a R Program to implement expressions, assignment and decision making	
B	Write a R program to demonstrate the use of essential data structures in R [Hint: Vectors, Matrix, Arrays]	
2	Using List, Data Frames and Functions in R	
A	Write an R program to manage data and exhibit operations on it using List data structure	
B	Write an R program to manage data and exhibit operations on it using Data Frames	
C	Write an R program to demonstrate the use of : i. user-defined functions ii. built-in numeric function, character functions etc.	
3	Implementing Strings in R	
A	Write an R program to store and access string in R objects (vectors, matrix, arrays, data frames, and lists)	
B	Write an R program to demonstrate use of various string manipulation functions. [Hint: paste(), print(), noquote(), format(), cat(), toString(), sprint()]	
4	Performing Statistics with R-I	
A	Write an R program to apply statistical functions mean, median, mode & standard deviation etc.	
B	Write an R program to demonstrate Linear and Multiple Regression analysis.	
5	Performing Statistics with R-II	
A	Write an R program to implement i. Normal Distribution. [Hint: dnorm(), pnorm(), qnorm(), rnorm()] ii. Binomial Distribution: [Hint: dbinom(), pbinom(), qbinom(), rbinom()]	
B	Write an R program to perform time-series analysis for the given data.	
6	Data Interfaces using CSV file in R	
A	Write a R program to read CSV file with & without Row names	
B	Write a R program to Write & append to CSV file	
C	Write a R program to calculate mean, sum, count of CSV file	

7	Data Interfaces using Excel file in R	
A	Write a R program to import to & Export from an Excel Fil	
B	Write a R program to convert an Excel column into a list, vector, dataframe	
C	Write a R program to delete rows with empty cells from Excel	
8	Data Visualization	
A	Write an R program to learn about Tabulation and related concepts [Hint: Contingency Tables, Selection of Parts, Conversion, Complex Tables, Cross Tabulation]	
B	Write an R program to demonstrate various ways of performing Graphical analysis.[Hint: Plots, Special Plots, Storing Graphics]	
9	Object Oriented Programming in R	
A	Write an R program to demonstrate OOP concepts, the construction and use of S3 and S4 classes	
B	Write an R program to define reference class and operations on them.	
10	Measuring Performance	
A	Write R program to measure the performance with the help of bult-in function like mrocrbechmark().	
II	Probability Distribution	
1.	Discover Probability using formulas:	
a.	Design and spreadsheet experiment to compute the probability by using formulas.	
b.	Create a spreadsheet application to compute the Conditional Probability, Independent events.	
2.	Bayes Theorem:	
a.	Formulate and apply Bayes' Theorem Calculations for problems like The "TwoSupplier Example".[Hint: Use Prior Probabilities and Conditional Probabilities to compute Joint and Posterior Probabilities]	
3.	Random Variables and Distribution Function:	
a.	Create spreadsheet application to Compute the Expected Value, Variance, and Standard Deviation of discrete and continuous random variables.	
4.	Joint Probability Distribution:	
a.	Create a spreadsheet application to implement joint probability law.	
b.	Create a spreadsheet application to calculate the expected mean and variance for Joint probability Distribution.	
5.	Mathematical Expectation Addition and Multiplication theorem:	
a.	Create a spreadsheet application to verify Addition theorem of expectation.	
b.	Create a spreadsheet application to verify Multiplication theorem of expectation.	
6.	Conditional Variance and Conditional variance:	
A	Create a spreadsheet application to find conditional variance and conditional expectation.	
7	Theoretical Discrete Distributions 1:	

A	Create spreadsheet application to demonstrate Bernoulli Distribution.	
B	Create spreadsheet application to Calculate Binomial Distribution in Excel. [Hint: Use BINOM.DIST]	
8	Theoretical Discrete Distributions 2:	
A	Create a spreadsheet application to Poisson Probability Distribution. [Hint: Use POISSON]	
B	Create spreadsheet application to demonstrate Uniform Discrete Distribution.	
9	Theoretical Continuous Distributions 1:	
A	Create spread application for computing probabilities and z values for the standard normal distribution. [Use NORMSDIST and NORMSINV]	
B	Create spreadsheet application to demonstrate Uniform Continuous Distribution.	
10	Theoretical Continuous Distributions 2:	
A	Create spread application for computing probabilities for the Gamma probability distribution. [Hint: Use GAMMA.DIST]	
B	Create spread application for computing probabilities for the exponential probability distribution. [Hint: Use EXPONDIST].	
	Total Hours	30

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Programme Name: B.sc (Data science)	Semester: II
Course Category/Vertical: Minor	
Name of the Dept: Science and Technology	
Course Title: Calculus	
Course Code: BDC204	Course Level:4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO):	
CO 1. To give the insight of calculus starting with continuity and derivatives.	
CO 2. To gain proficiency in integration.	
Course Outcomes (OC):	
OC 1. Quickly and easily find the derivative of a function.	
OC 2. Performing the integration of functions with ease	
Description the course:	The course introduces learners to understanding the sudden changes or spikes in the data by calculating its derivative and integration can then be applied to smooth the data by averaging or filtering out these fluctuations.

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Unit No.	Content	Hours
I	Continuity and Derivatives: Limits at Infinity;Horizontal Asymptotes, Derivatives and Rates of Change, The Derivative as a Function. Differentiation rules: Derivatives of Polynomials and Exponential Functions, The Product and Quotient Rules, The Chain Rule, Implicit Differentiation, Derivatives of Logarithmic Functions, Rates of Change in the Natural and Social Sciences, Exponential Growth and Decay, Related Rates, Linear Approximations and Differentials, Hyperbolic Functions	15
II	Integrals: Areas and distances ,The Definite Integral ,The Fundamental Theorem of Calculus ,Indefinite Integrals and the Net Change Theorem ,The Substitution Rule, Integration by Parts, Trigonometric Integrals , Trigonometric Substitution , Integration of Rational Functions by Partial Fractions , Strategy for Integration , Integration Using Tables and Computer Algebra Systems , Approximate Integration ,Improper Integrals.	15
	Total Hours	30

References:

- (1) Calculus– Early Transcendents James Stewart Thomson 6th edition 2008.
- (2) Calculus and Analytical Geometry by George B.Thomas Jr. , RossL. Finney M aurice D.Weir Addison Wesley Publishing Company 1998
- (3) Schaum's 3000 Solved Problems in Calculus Elliot Mendelson Tata Mc Graw Hill s1988

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Programme Name: B.Sc.(Data Science)	Semester: II
Course Category/Vertical: Open Elective	
Name of the Dept: Science and Technology	
Course Title: Financial Markets	
Course Code: BDF205	Course Level: 4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO):	
CO1: To provide students with the complete understanding of Indian financial Markets and its evolution.	
CO2: To give an overview of financial markets, its classification and importance	
Course Outcomes (OC):	
OC1: After the successful completion of the course the student will have Knowledge about Indian financial Markets as well as a brief understanding of financial systems in other nations.	
OC2: Students will be aware about financial markets and its types.	
Description the course: (Including but not limited to)	Basic Knowledge of Indian Financial Market, Types and Understanding of Financial System

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Unit No.	Content	Hours
I	<p>Module-1: Indian Financial System And Financial Markets</p> <p>An introduction to the financial system, Components of Financial System</p> <p>Financial Markets, Definition, Functions</p> <p>Classification: Primary Market & Secondary Market</p> <p>Financial Markets Structure, Financial instruments</p>	15
II	<p>Module-2: Commodity And Derivative Market</p> <p>Introduction to Commodities Market - Meaning History & Origin, Types of Commodities Traded, Structure of Commodities Market in India</p> <p>Participants in Commodities Market, Introduction to Derivatives Market – Meaning, Elements of a Derivative Contract, Types of Derivatives, Types of Underlying Assets</p> <p>Participants in Derivatives Market, Difference Between Forwards & Futures</p>	15
	Total Hours	30

References:

- Financial Services and Markets By Dr. S. Gurusamy- Thomson Publication
- Banking & Financial Markets in India By Niti Bhasin - New NC Century
- Indian Financial System By Dr. S. C. Bihari - International Book House Pvt Ltd
- Financial Institutions And Markets By Bhole and Mahakud – Mc Graw Hill

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Programme Name: B.Sc.(Data Science)	Semester:II
Course Category/Vertical: Open Elective	
Name of the Dept: Science and Technology	
Course Title: Digital Marketing.	
Course Code: BDD206	Course Level:4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO):	
CO1: To acquaint the students with the knowledge of growing integration between the traditional and digital marketing concepts and practices in the digital era	
CO2: To familiarize the students with the tools and techniques used by the digital marketers for driving the marketing decisions to attain marketing objectives.	
Course Outcomes (OC):	
OC1: Students will be able to understand the concept of digital marketing and its integration with traditional marketing as well as examining various tactics for enhancing a website's position and ranking with search engines.	
OC2: Students will be able to understand social media marketing and apply the learnings to create digital media campaigns.	
Description the course: (Including but not limited to)	Digital marketing comprises all marketing efforts that use the Internet. These include digital channels such as search engines, email, websites, social media, etc., that can be used to connect with current and prospective customers.

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Unit No.	Content	Hours
I	<p>1. Introduction to digital marketing- Meaning of Digital Marketing, Differences from Traditional Marketing, Return of Investments on Digital Marketing vs. Traditional Marketing, E Commerce, Tools used for successful marketing, SWOT Analysis of Business for Digital Marketing, Meaning of Blogs, Websites, Portal and Their Differences, Visibility, Visitor Engagement, Conversion Process, Retention, Performance Evaluation.</p> <p>2. Search Engine Optimization (SEO): On page Optimization Techniques, Off Page Optimization Techniques, Preparing Reports, Creating Search Campaigns, Creating Display Campaigns. Social Media Optimization (SMO): Introduction to Social Media Marketing, Advanced Facebook Marketing</p>	15
II	<p>1. Word press Blog Creation: Twitter Marketing, LinkedIn Marketing, Instagram Marketing, social media Analytical Tools. Search Engine Marketing: Meaning and Use of Search Engine Marketing, Tools used — Pay Per Click, Google Adwords, Display Advertising Techniques, Report Generation</p> <p>2. Website Traffic Analysis, Affiliate Marketing and Ad Designing: Google Analytics, Online Reputation Management, EMail Marketing, Affiliate Marketing, Understanding Ad Words Algorithm, Advertisement Designing</p>	15
Total Hours		30

References:

1. Digital Marketing by Seema Gupta McGraw Hill
2. Internet Marketing: A practical approach in the Indian context: Oxford Publishing
3. Digital Marketing: Strategy, Implementation & Practice – Dave Chaffey & Fiona Ellis
4. Art of SEO (3rd edition) – Eric Enge

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Programme Name: B.Sc. (Data Science)	Semester:II
Course Category: Vocational Skill Course	
Name of the Dept: Science and Technology	
Course Title: Database Management System	
Course Code: BDM207	Course Level:4.5
Type: Theory	
Course Credit: 2	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO):	
<ol style="list-style-type: none"> 1. The objective of the course is to present an introduction to fundamentals of database management systems. 2. To learn how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS 	
Course Outcomes (OC):	
<p>OC1: Understand Database as a Relational model for Organizing, structuring, storing of data and SQL to retrieve data.</p> <p>OC2: To understand creation, manipulation and querying of data in databases.</p>	
Description the course: (Including but not limited to)	"Database Management System" introduces learners to the fundamental principles and practices of organizing, storing, and accessing data efficiently. This course provides a comprehensive overview of database concepts, including relational database design, SQL querying, normalization, and indexing. Participants will gain practical skills in designing, implementing, and managing databases to meet the information needs of businesses and organizations

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Unit No.	Content	Hours
I	<p>Introduction: Why Databases? Data versus Information, Introducing the Database, Role and Advantages of the DBMS, Types of Databases</p> <p>Entity Relationship Model: Conceptual modelling and database design: Data modelling using the Entity Relationship model (ER). The enhanced entity relationship model. Relational database design by ER and EER model. Practical database design methodology and use of UML diagrams.</p> <p>Normalization of Database Tables: Database Tables and Normalization, The Need for Normalization, The Normalization Process, Improving the Design, Surrogate Key Considerations, HigherLevel Normal Forms, Normalization and Database Design, Denormalization, Data-Modeling Checklist</p>	15
II	<p>Structured Query Language (SQL): Introduction to SQL, Basic SELECT Queries, SELECT Statement Options, FROM Clause Options, ORDER BY Clause Options, WHERE Clause Options, Aggregate Processing, Subqueries, SQL Functions, Relational Set Operators, Crafting SELECT Queries</p> <p>Advanced SQL: Data Definition Commands, Creating Table Structures, Altering Table Structures, Data Manipulation Commands, Virtual Tables: Creating a View, Sequences, Function and Procedural SQL.</p> <p>Transaction Management and Concurrency Control: What Is a Transaction? Concurrency Control with Locking Methods, Concurrency Control with Time Stamping Methods, Concurrency Control with Optimistic</p>	15
Total Hours		30

References:

1. Fundamentals of Database systems. Ramez Elmasri, Shamkant B Navathe Pearson. 6th Edition.
2. Database Management Systems, Ramakrishnam, Gehrke, McGraw- Hill, 2007
3. The Programming Language of Oracle, 4th Revises Edition, Ivan Bayross
4. Oracle PL/SQL Programming, Steven Feuerstein with Bill Pribyl

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Programme Name: B.Sc. (Data Science)	Semester:II
Course Category: Skill Enhancement Course	
Name of the Dept: Science and Technology	
Course Title: Database Management System Practical	
Course Code: BDMP208	Course Level:4.5
Type: Practical	
Course Credit: 2	
Hours Allotted: 60 Hours	
Marks Allotted: 50 Marks	
Course Objectives(CO):	
CO1: he objective of the course is to present an introduction to fundamentals of database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS	
Course Outcomes(OC):	
OC1 - Understand Database as s Relational model for Organizing, structuring, storing of data and SQL to retrieve data.	
OC2 - To understand creation, manipulation and querying of data in databases.	
Description the course: (Including but not limited to)	"Database Management System" introduces learners to the fundamental principles and practices of organizing, storing, and accessing data efficiently. This course provides a comprehensive overview of database concepts, including relational database design, SQL querying, normalization, and indexing. Participants will gain practical skills in designing, implementing, and managing databases to meet the information needs of businesses and organizations.

Unit No.	Content	Hours
1.	List of Practical: (Can be done in Oracle / SQL Server / MySQL)	
a	Draw E-R diagram and convert entities and relationships to relation table for a given scenario: Bank	
b	College	
2	Write relational algebra queries for a given set of relations	
3	Defining data	
a	Using CREATE statement	
b	Using ALTER statement	
c	Using DROP statement	
d	Using TRUNCATE statement	
e	Using RENAME statement	
4	Manipulating data	
a	Using INSERT statement	
b	Using UPDATE statement	
c	Using DELETE statement	
d	Using SELECT statement	
5	Creating and managing the tables	
a	Creating table with constraints: NOTNULL, UNIQUE, PRIMARY KEY , FOREIGN KEY	
6	Restricting and sorting data	
a	Using DISTINCT, IN, AS, SORT, LIKE, ISNULL, OR	
b	Using Group By, Having clause, Order By clause	
7	Aggregate and Mathematical functions	
a	AVG, MIN,MAX,SUM,COUNT	
b	ABS, SQRT, ROUND, TRUNCATE, SIGN, POWER, MOD, FLOOR, CEIL	
8	Views and Joins: For a given set of relation tables perform the following	
a	Creating view	
b	Dropping view	
c	Selecting from a view	
9	Database trigger	
a	Using CREATE OR REPLACE TRIGGER	
10	Functions and Procedures.	

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Programme Name : B.Sc. (Data Science)	Semester: II
Course Category/Vertical: Ability Enhancement Course	
Name of the Dept: Science and Technology	
Course Title: Corporate Communication-II	
Course Code: BWD209	Course Level: 4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO):	
CO1: To inculcate the knowledge of basic communication skills in learners and make learners aware of how non-verbal communication impacts daily communication.	
CO2: To inculcate effective business writing skills in learners and create awareness about ethics in information	
Course Outcomes (OC):	
OC1: Learners would develop their basic communication skills and gain knowledge of how verbal and non-verbal communication impacts the business world.	
OC2: Develop effective business writing skills	
Description the course:	The course introduces learners to the basic concepts of communication required in personal and professional lives. It will assist them in making effective use of both verbal and non-verbal methodologies of communication. The course will inculcate effective writing skills in learners enabling them to overcome the communication challenges they may face in the corporate world. With these skills they can turn out to be communication experts and PR experts as well.

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Unit No.	Content	Hours
I	<p>Introduction to Soft Skills – I Soft skills – Meaning, features, scope, importance, relevance of soft skills in the corporate world, relevance of soft skills in personal space, Soft skills v/s hard skills</p> <p>Listening skills – Meaning, Importance, Essentials of good listening skills, Qualities of a good listener, Types of listening skills, Barriers to effective listening, Process of listening, Active v/s Passive Listening</p> <p>Leadership – Meaning, Attributes of a good leader, Styles of leadership, Leading through change</p>	15
II	<p>Personality Development and Etiquettes</p> <p>Personality – Meaning, Determinants of personality, Personality Traits – Locus of Control, Type A and Type B Personality, Machiavellianism, Self-Monitoring</p> <p>Time Management – Meaning, Importance, principles of time management, 4 P's, 4D's of time management, Challenges in time management, Tips for good time management.</p> <p>Etiquettes – Meaning, Importance, Ethics v/s Etiquettes.</p> <p>Types of Etiquettes – Telephone Etiquettes, Email Etiquettes, Meeting Etiquettes, Dining Etiquettes, Cubicle Etiquettes, Dressing and Grooming Etiquettes, Social media Etiquettes, Internet Etiquettes, Workplace Etiquettes</p>	15
Total Hours		30

References:

1. Daniel Coleman, Emotional Intelligence, Bantam Book, 20 ICT Academy of Kerala, "Life Skills for Engineers", McGraw Hill Education (India) PrivateLtd.,2016.
2. Caruso, D. R. and Salovey P, "The Emotionally Intelligent Manager: How to Develop and Use the Four Key Emotional Skills of Leadership", John Wiley & Sons, 2004.
3. Kalyana, "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd,

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Programme Name: B.Sc. (Data Science)	Semester:II
Course Category/Vertical: Value Education Course	
Name of the Dept: Science and Technology	
Course Title: Green Technology – II	
Course Code: BDG210	Course Level:4.5
Type: Theory	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Course Objectives (CO):	
CO1.Understand issues and modern approaches of Green Computing and alternatives for cooling your data center and the need for making computer networks and communications energy efficient.	
CO2.Understand cloud computing in the context of environmental sustainability and various elements of clouds that contribute to total energy consumption	
Course Outcomes (OC):	
OC1. Develop knowledge about the concept green IT standards and certifications related to sustainable IT products as well as Describe green IT in relation to technology.	
OC2. Evaluate IT use in relation to environmental perspectives and Formulate plans for reducing IT heating and cooling requirements as well as Implement Green IT in Real Life	
Description the course: (Including but not limited to)	The course introduces the learners to the concept of sustainable approach to IT resource management, focusing on minimizing environmental impact in the context of environmental concerns. The learners could upgrade their current understanding towards Green IT practices, reducing energy consumption and electronic waste, promoting efficient, cost-effective, and environmentally sustainable IT systems. Students would be able to explore new areas of IT professionals with expertise in Green IT.

Unit No.	Content	Hours
I	<p>•Overview and Issues: Problems: Toxins, Equipment Disposal, Company's Carbon Footprint: Measuring, Global Initiatives: United Nations, Basel Action Network, Basel Convention, North America: The United States, Canada, Australia, Europe, WEEE Directive, RoHS, National Adoption, Asia: Japan, China, Korea.</p> <p>•Minimizing Power Usage: Power Problems, Monitoring Power Usage, Servers, Low-Cost Options, Power Consumption, Reducing Power Use, Data De-Duplication, Virtualization, Monitors, Power Supplies, Wireless Devices</p>	15
II	<p>•Cooling: Cooling Costs, Power Cost, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, HP's Solution, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Cable Management, Vapour Seal, Prevent Recirculation of Equipment Exhaust, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling, Fluid Considerations, System Design, Datacentre Design, Centralized Control, Design for Your Needs.</p> <p>Green Networks and Communications : Introduction, Objectives of Green Network Protocols, Green Network Protocols and Standards.</p> <p>•Green Cloud Computing and Environmental Sustainability: Introduction, What is Cloud Computing?, Cloud Computing and Energy Usage Model: A Typical Example, Features of Clouds Enabling Green Computing, Green Cloud Architecture</p>	15
	Total Hours	30

References:

Green IT Toby Velte, Anthony Velte, & Robert Elsenpete McGraw Hill 2008
 Harnessing Green It Principles And Practices San Murugesan, G.R. Gangadharan WILEY
 Green Computing Tools and Techniques for Saving Energy, Money and Resources Bud E. Smith CRC Press 2014

Sheth T. J. Education Society's
 Sheth N.K.T.T College of Commerce and
 Sheth J.T.T College of Arts,(Autonomous) Thane (W)

Programme Name: All programmes	Semester: II
Course Category: Certificate Course (CC)	
Name of the Department: Sociology	
Course Title: National Service Scheme Paper II	
Course Code: As per course structure	Course Level:4.5
Type: Theory / Practical	
Course Credit: 2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)	
Hours Allotted: 30 Hours	
1. Marks Allotted: 50 Marks	
Course Objectives:	
1. To make aware the students about NSS ideology ii. To make students understand Youth Development Program in India and Role of Youth Leaders	
Course Outcomes:	
1. Students will be inspired from social reformer 2. Students will understand social issues in India.	
Introduction: The NSS introduces students to the concept of voluntary community service as a means of personal development and nation-building. It typically involves engaging in various activities such as environmental conservation, literacy campaigns, health awareness drives, and disaster relief efforts.	
Relevance and Usefulness: In today's society, where there is a growing need for civic engagement and social cohesion, the NSS plays a crucial role. It instills a sense of civic duty and social responsibility in young people, empowering them to contribute positively to their communities and society at large.	
Application: Through hands-on participation in community service projects, NSS volunteers gain practical experience in leadership, teamwork, problem-solving, and communication skills. They also develop a deeper understanding of social issues and learn how to address them effectively through grassroots initiatives.	
Interest and Connection with Other Courses: The NSS intersects with various academic disciplines such as social work, public administration, sociology, and development studies. It provides students with opportunities to apply theoretical knowledge in real-world settings and reinforces the importance of active citizenship and social justice.	
Demand in the Industry: Employers increasingly value candidates who demonstrate a commitment to community service and civic engagement. Participation in the NSS signals to potential employers that an individual is socially conscious, proactive, and capable of working collaboratively towards common goals.	

Job Prospects: Graduates who have participated in the NSS often find themselves well-equipped for a wide range of career paths. They may pursue roles in the nonprofit sector, government agencies, corporate social responsibility departments, international development organizations, or even entrepreneurship ventures with a social impact focus.

Syllabus: NEP 2020 w.e.f 2024-25

Unit No.	Content	Hours
I	<p>UNIT I: Youth Development</p> <ul style="list-style-type: none"> - National Youth Policy - Role and Importance of youth leadership, -Leadership capability and its development, 	15
II	<p>UNIT II: Social Reformers</p> <ul style="list-style-type: none"> - Social Reformers: Mother Teresa, Baba Amte, Dr. Abhay Bang and Dr. Rani Bang. - Role and Responsibility of youth in various activities of N.S.S 	15
	Total Hours	30

References:

1. National Service Scheme Manual (Revised) 2006, Government of India, Ministry of Youth Affairs and Sports, New Delhi.
2. University of Mumbai National Service Scheme Manual 2009.
3. <http://nss.nic.in>
4. <https://www.rccmindore.com/wp-content/uploads/2023/04/NSS-Notes-II.pdf>

Scheme of Examination

Internal : 20 Marks

External: 30 Marks

Internal	Marks: 20
Assignment	5 marks
Active participation/Attendance	5 Marks
Class test	10 Marks

Paper Pattern for Internal and External Examination

Internal Examination – Class Test

Q.1.MCQ question . 10 marks

External Examination-

Assignment based on Community work. 30 marks

Sheth T. J. Education Society's
 Sheth N.K.T.T College of Commerce and
 Sheth J.T.T College of Arts, Thane (W)
 (Autonomous)

Programme Name: All programmes	Semester: II
Course Category/Vertical: Co-Curricular (CC)	
Name of the Dept: Psychology	
Course Title: Yoga	
Course Code: As mentioned in course structure	Course Level: 4.5
Type: Theory / Practical	
Course Credit: 2 credits	
Hours Allotted: 30 Hours	
Marks Allotted: 50 Marks	
Learning Objectives:	
<ol style="list-style-type: none"> 1. To impart to the students the knowledge of teachings and philosophy of yoga tradition. 2. To provide the knowledge of various Yoga therapy practices like asana (posture), pranayama (voluntarily regulated breathing techniques). 	
Course Outcomes (CO):	
OC 1. Students will be able to understand the basic principles and applications of Yoga.	
OC 2. Students will be able to use the Practical knowledge in their day to day life.	
Description the course: (Including but not limited to)	Yoga practices will be important for the upcoming lifestyle hence students can seek a career in the same. Students will understand the importance of yoga in life. Students will be having practical exposure. Hence, practicing yoga will help students to maintain their health.

Syllabus: NEP 2020 w.e.f 2024-25

Unit No.	Content	Hours
I	Theory of Yoga A) Yoga Meaning and Definition: Micro Circulatory and Macro Circulatory Practices B) Shuddhi Kriya: Shwasan Marg Shuddhi, Kapalbhati Meditation: Yoga Nidra	10
II	Practical A) Standing Yogasana : Hastapadasana, Urdhva Hastasana, Kati Chakrasana, Sitting Yogasana : Yogmudra Prone Asana : Urdhvamukh Shvanasana, Samkonasana, Supine Yogasana : Utthita Ekpadasana, Supta Ardha Matsyendrasana, Supta Tadasana, Uttan Vakrasana B) Pranayama: Chandrabhyas, Suryabhyas Abdominal Breathing, Thoracic Breathing, Clavicle Breathing	20
	Total Hours	30

References:

1. Rajayoga - Swami Vivekananda - Ramakrishna Ashrama Publications.
2. C.D. Sharma: Critical Survey of Indian Philosophy, Motilal Banarsi Dass Publications 2003
3. G. V. Kadam - Yoga Life Sutra, Girish Vasant Kadam (2012)

Scheme of Examination

Paper Pattern for External Examination

Practical demonstration of asanas	30 marks
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Paper Pattern for Internal Examination: 20 Marks

Internal	Marks: 20
Viva	10 marks
Quiz	5 marks
Class Participation	5 marks

