MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA

A College with Potential for Excellence

ISO 91001: 2018 Certified

PROGRAMME REGISTER

2023-2026

DEPARTMENT OF STATISTICS

INDEX

PROGRAMME OUTCOMES (POs)

2023-2026

Students of all Undergraduate Programmes at the time of graduation will be able to possess

PO1: Essential Knowledge

Have comprehensive discipline knowledge and understanding, the ability to engage with different schools of thought and to apply their knowledge in practice including in multidisciplinary or multi-professional contexts.

PO2: Creative, Critical Thinking and Problem-Solving Abilities

Be effective problem-solvers, able to apply critical and evidence-based thinking to conceive innovative responses to future challenges.

PO3: Teamwork and Communication Skills

Convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving common goals.

PO4: Motivated, Self-directed, and Life-long Learning

Exhibit life-long skills; broad-based multiple career oriented general skills; self and field-based learning skills; digital skills; preparedness for living, learning and working in any environment.

PO5: Professionalism and Leadership Readiness

Engage in professional behaviour and have the potential to be entrepreneurial and take leadership roles in their chosen occupations and communities.

PO6: Intercultural and Ethical Competency

Be responsible and effective global citizens whose personal values and practices are consistent with their roles as responsible members of society.

PO7: Self-awareness and Emotional Intelligence

Be self-aware and reflective, flexible and resilient and act with integrity and take responsibility for their actions as empowered women.

PO8: Social Responsibility and Effective Citizenship

Exhibit social responsibility and compassionate commitment; Be sensitive to and demonstrate institution in matters of environment, gender and other social issues to promote an equitable society and sustainable development.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

2023-2026

At the end of the programme the student will be able to possess

PSO1: Quantitative Analysis

Interpret principles, classifications, concepts, theories and mechanisms learnt.

PSO2: Practical and Analytical Skills

Analyse hypotheses, procedures, properties, experimental facts and draw conclusions.

PSO3: Logical and Critical Thinking

Apply knowledge and techniques in sample analysis, problem-solving, results, and production.

PSO4: Teamwork and Communication

Develop communicative competence, creative and critical thinking, practical, technical and employability skills, social sensibility and responsibility.

Course Outcomes (COs)
2023-2026

S. No.	Sem	Course Code	Course Title	Course Outcomes (COs)
1	I	23SCCCEA14	Essentials and Applications of Mathematical, Physical & Chemical Sciences	**CO1**:Apply mathematical principles to solve various problems across complex numbers, trigonometry, vectors, and statistical analysis involving data sets.
				CO2: Summarize key physics principles, including measurements, motion, thermodynamics, wave behaviour, electromagnetism, atomic structure, and theories of the universe.
				CO3: Outline the fundamental concepts of chemistry and their relevance in daily life.
				CO4: Elaborate the interconnectedness of math, physics and chemistry and explain how they predict phenomena in diverse contexts.
				CO5: Discuss about computer evolution, including the internet, network types and understand ethical issues in network security, cryptography, privacy and data protection.
2	I	23SCCCAS14	Advances in Mathematical, Physical & Chemical Sciences	**CO1:** Identify the applications of mathematics in physics and chemistry to solve real-world problems.
				CO2: Explain renewable energy generation, storage, energy-efficient materials and recent advancements in nanotechnology, biophysics, medical physics, and materials science.
				CO3: Outline computer-aided drug design, Nano sensors, chemical biology, the impact of chemical pollutants on ecosystems and human health, and methods for dye removal using catalysis.
				CO4: Elaborate the interconnectedness of math, physics and chemistry and apply these principles to explain phenomena in diverse contexts.

				CO5: Summarize the advanced computer science topics, such as number systems, signals, error detection and correction, multiplexing, transmission media, and networking devices.
3	II	23STCCDS23	Descriptive Statistical methods	**CO1:** Understand the role of statistics in different fields
				CO2: Present the data in the format most applicable to their own data.
				CO3: Apply the measures of central tendency and dispersion to reduce the data to a single value which is useful for making comparative studies.
				CO4: Explain the basics of probability, types, theorems and be able to apply it in real life situations where there is uncertainty and to measure it.
4	II	23STP1DS21	Descriptive Statistical methods -Practical	**CO1:** Interpret diagrammatic data presentation.
				CO2: Determine the reliability of an average using central tendency measures and compare the variability of two or more series with the help of Dispersion measures.
5	II	23STCCME23	Random Variables & Mathematical Expectations	**CO1:** Understand the role of statistics in dealing with the univariate and Bivariate random variables.
				CO2: Apply the univariate data and bivariate data to different real life situations.
				CO3: Interpret the given data by using mathematical expectations.
				CO4: Understand and interpret the generating functions, law of large numbers and central limit theorem.
6	II	23STP2ME21	Random Variables & Mathematical Expectations - Practical	**CO1:** Solve the problems with univariate and Bivariate random variables.
				CO2: Apply mathematical expectations to the given data.
				CO3: Understand and interpret the generating functions.
7	II	23STCCSM24	Statistical Methods for Business Analytics	**CO1:** Describe the fundamentals of Statistics and its application in the field of Business.
				CO2: Explain and evaluate measures of central tendency and

				Dispersion.
				CO3: Discuss the basic concepts of Correlation and Regression and their applications.
				CO4: Understand the concepts of Index Numbers and time series and apply them to the business data.
8	III	23STCCDD33	Theoretical Discrete Distributions	**CO1:** Differentiate different types of discrete distributions.
				CO2: Explain different properties of discrete distributions
				CO3: Derive the characteristics of different discrete distributions.
				CO4: Identify different real life problems and apply discrete distributions to draw valid inferences.
9	III	23STP3DD31	Theoretical Discrete Distributions-Practical	**CO1:** Apply Binomial, Poisson distributions to the real life data to draw inferences.
				CO2: Apply Negative Binomial, Geometric and Hypergeometric distributions to the real life situations to draw valid conclusions.
10	III	23STCCCD33	Theoretical Continuous Distributions	**CO1:** Differentiate different types of continuous distributions.
				CO2: Derive the characteristics of different continuous distributions.
				CO3: Identify different real life problems and apply continuous distributions to draw valid inferences.
				CO4: Interpret t, F and $\chi 2$ distributions and derive their properties.
11	III	23STP4CD31	Theoretical Continuous Distributions - Practical	**CO1:** Apply Uniform, Exponential and Gamma distributions to the real life data to draw inferences.
				CO2: Apply Normal distribution to real life situations to draw valid conclusions.
12	III	23STCCSM33	Statistical Methods	**CO1:** Interpret bivariate data and estimate future values by using curve fitting.
				CO2: Calculate the relationship between bivariate and multivariate data using Correlation methods.
				CO3: Forecast business data by using regression techniques.

				CO4: Estimate the association of the categorical data by using attributes.
13	III	23STP5SM31	Statistical Methods - Practical	**CO1:** Apply least square method to the given data and to fit different curves
				CO2: Apply correlation and regression methods to the given data to understand the relationship between the variables under study.
				CO3: To find the association of the categorical data by using attributes.
14	III	23STCCIS33	Inferential Statistics	**CO1:** Examine different methods of estimation.
				CO2: Explain the definitions and concepts of hypothesis testing
				CO3: Differentiate the types of sample sizes and apply large and small sample tests to real data.
				CO4: Distinguish between parametric and non-parametric tests and apply them to real life data.
15	III	23STP6IS31	Inferential Statistics - Practical	**CO1:** Apply Large sample tests and small sample tests to different real life situations
				CO2: Apply the non-parametric tests to real life data.
16	III	23STCCRM34	Business Research Methods	**CO1:** Identify nature and scope of business research and define its characteristics.
				CO2: Differentiate between the Exploratory, Descriptive and Experimental research.
				CO3: Construct the questionnaire and apply them in different sampling methods.
				CO4: Analyze the data by using different statistical techniques.
				CO5: Write a proper research report and present it effectively.
17	IV	23STCCST43	Sampling Techniques	**CO1**: Design and implement surveys using sampling techniques.
				CO2: Estimate the characteristics of different sampling techniques.

				CO3: Differentiate between different types of sampling techniques and compare their variances.
				CO4: Understand the real-time inputs for policies and stronger dissemination practices for the public.
18	IV	23STP7ST41	Sampling Techniques-Practical	**CO1:** Estimate the characteristics of different sampling techniques.
				CO2: Compare the efficiencies of different sampling techniques for a given data.
19	IV	23STCCDE43	Design & Analysis of Experiments	**CO1**: Interpret the results of ANOVA through computation.
				CO2: Summarize the principles, phases and scope of designs
				CO3: Apply and analyze basic designs (CRD, RBD and LSD)by taking real time data.
				CO4: Interpret the analysis of full factorial designs and apply them to the real data.
20	IV	23STP8DE41	Design & Analysis of Experiments-Practical	**CO1**: Apply the ANOVA technique to the given data to draw valid conclusions.
				CO2: Apply the Basic designs (CRD, RBD and LSD) to real life situations and interpret the results.
				CO3: Analyze the results of the full Factorial designs.
21	IV	23STCCNA43	Numerical Analysis	**CO1**: Learn the different difference operators and applications.
				CO2: Identify and apply the interpolation techniques with equal and unequal intervals to the real life data.
				CO3: Analyze the real time data by using numerical differentiation tools.
				CO4: Analyze the real data by applying numerical integration methods.
22	IV	23STP9NA41	Numerical Analysis-Practical	**CO1:** Apply the interpolation techniques with equal and unequal intervals to the real life data.
				CO2: Analyze the real time data by using numerical differentiation tools.
				CO3: Analyze the real data by applying numerical integration methods.
23	IV	23STCCQC44	Statistical Quality Control	**CO1:** Differentiate between process control and product control

				CO2: Construct different control charts for variables and attributes
				CO3: Identify different acceptance sampling plans and differentiate them.
				CO4: Understand the Six Sigma concepts and its role in quality management.
24	IV	23MDCBS42	Basic Statistics	**CO1:** Understand the role of statistics in different fields
				CO2: Apply the measures of central tendency and dispersion to reduce the data to a single value which is useful for making comparative studies.
				CO3: Understand and apply the correlation and regression concepts to the real life data.
25	V	23STCCAS53	Applied Statistics	**CO1:** Analyze Time Series Components and Evaluate Trends Using Various Methods.
				CO2: Analyze Seasonal Indices and Interpret Deseasonalized Data to Identify Trends.
				CO3: Estimate and Calculate Various Index Numbers to Analyze Economic Trends.
				CO4: Analyze Vital Statistics, Develop Life Tables, and Evaluate Population Growth Measures.
26	V	23STP10AS51	Applied Statistics - Practical	**CO1:** Analyze trends and seasonal indices using various methods.
				CO2: Calculate index numbers, mortality and fertility rates, reproduction rates, and construct life tables to analyze demographic trends.
27	V	23STCCCR53	Computational Statistics & R Programming	**CO1:** Identify components and applications, explain languages and files, operate software and systems, classify software and analyze CPU's role.
				CO2: Apply Excel tools for data management, calculations, graphing and prediction. Use Data Analysis Pak for statistical tests and interpret P-values.
				CO3: Understand R and RStudio features, apply basic concepts, data structures, and control structures. Work with vectors and handle missing values. Perform filtering, subsetting, and vectorized operations.
				CO4: Create and manipulate matrices and data frames,

				perform exploratory data analysis and handle missing values, apply R visualization techniques, including 3D plots.
28	V	23STP11CR51	Computational Statistics & R Programming - Practical	**CO1:** Install and Configure R and RStudio, create a working directory, and install essential packages.
				CO2: Perform basic operations with vectors and matrices, and manage data structures effectively.
				CO3: Conduct statistical analysis and create visualizations to interpret and present data.
29	V	23STEC11OR53	Operations Research	**CO1:** Understand Operations Research principles and apply mathematical modeling to Linear Programming Problems.
				CO2: Analyze and solve linear programming problems graphically, addressing exceptional cases and understanding convex and non-convex hulls.
				CO3: Define key concepts of General Linear Programming Problems and solveLPP using the Simplex method.
				CO4: Apply artificial variable techniques, solve degeneracy and non-feasible solutions, and use Duality and Dual Simplex for primal problems.
30	V	23STP1211OR51	Operations Research - Practical	**CO1:** Solve Linear Programming Problems graphically, addressing unbounded and infeasible solutions.
				CO2: Apply the Simplex method to find optimal solutions for Linear Programming Problems.
				CO3: Solve LPPs using the Big-M and Two-Phase methods, handle special cases like unbounded and multiple solutions, and apply duality and the Dual Simplex method.
31	V	23STEC12QC53	Statistical Quality Control	**CO1:** Understand how SQC improves quality, recognize the 4 M's, and distinguish between assignable and chance causes of variation.
				CO2: Construct and interpret control charts for variables and attributes, identify out-of-control processes, and determine corrective actions.
				CO3: Design and implement sampling, apply concepts like Producers and Consumer's risk and OC curves, and calculate AOQ and AOQL.

				CO4: Develop the ability to compute acceptance probabilities, determine sampling plans, and graphically find AOQL to enhance quality assurance.
32	V	23STP1312QC51	Statistical Quality Control - Practical	**CO1:** Construct and interpret control charts like Mean and R, Mean and Standard Deviation, p, np, C, and U charts to monitor process stability and quality.
				CO2: Apply statistical tools like the OC curve, risks, AOQ, AOQL, and ATI to enhance process quality with single sampling plans for attributes.
				CO3: Determine and apply single sampling plans using lot quality and average quality approaches to ensure desired quality levels and minimize risks.
33	V	23STEC21OT53	Optimization Techniques	**CO1:** Apply North-West Corner, Lowest Cost Entry, Vogel's Approximation, and MODI methods to solve transportation problems with degeneracy and maximization.
				CO2: Analyze and solve assignment problems.
				CO3: Solve sequencing problems with Johnson's algorithm and apply game theory to two-person zero-sum games using strategies, Maximin/Minimax principles, and graphical methods.
				CO4: Apply network scheduling techniques, including network components, time calculations, and CPM/PERT for effective project management.
34	V	23MTP1421OT51	Optimization Techniques - Practical	**CO1:** Apply and analyze various methods for solving Transportation problems and Assignment problems.
				CO2: Maximize work time and profits in an industry by efficiently allocating jobs to the most suitable individuals.
				CO3: Minimize project elapsed time using CPM and PERT, and solve basic game theory models to enhance decision-making and strategy optimization.
35	V	23STEC22AS53	Applied Statistics II	**CO1:** Fit growth curves, analyze detrending effects, and calculate index numbers with base shifting, splicing, and deflation.
				CO2: Estimate elasticities and interpret economic data using demand analysis techniques.

				CO3: Apply psychological and educational statistics techniques, such as scaling test items, Z-scores, T-scores, and percentile scores, to interpret test data.
				CO4: Evaluate test reliability and validity using various methods and compare them in test scores.
36	V	23MTP1522AS51	Applied Statistics II - Practical	**CO1:** Analyze and apply curve fitting techniques using methods like three selected points and partial sums to derive accurate models.
				CO2: Calculate and evaluate index numbers using base shifting, deflation, and splicing to improve data interpretation and comparison.
				CO3: Assess economic concepts like elasticities, Pareto's curve, and test reliability by analyzing difficulty values, standard deviations, and mean scores for insights.

Mapping of Cos with PSOs & POs

S. No.	Sem	Course Code	Course Title	COs	PSOs	POs
1	I	23SCCCEA14	Essentials and Applications of Mathematical, Physical & Chemical Sciences	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO5	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
2	I	23SCCCAS14	Advances in Mathematical, Physical & Chemical Sciences	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO5	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
3	II	23STCCDS23	Descriptive Statistical methods	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
4	II	23STP1DS21	Descriptive Statistical methods-Practical	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
5	II	23STCCME23	Random Variables &	CO1	PSO1,PSO2,	PO1,PO2,PO3,PO4

			Mathematical Expectations		PSO3,PSO4	
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
6	II	23STP2ME21	Random Variables & Mathematical Expectations - Practical	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
7	II	23STCCSM24	Statistical Methods for Business Analytics	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
8	III	23STCCDD33	Theoretical Discrete Distributions	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
9	III	23STP3DD31	Theoretical Discrete Distributions- Practical	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
10	III	23STCCCD33	Theoretical Continuous Distributions	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4

				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
11	III	23STP4CD31	Theoretical Continuous Distributions-Practical	CO1	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
12	III	23STCCSM33	Statistical Methods	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
13	III	23STP5SM31	Statistical Methods - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
14	III	23STCCIS33	Inferential Statistics	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
15	III	23STP6IS31	Inferential Statistics - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
16	III	23STCCRM34	Business Research Methods	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4

				CO5	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
17	IV	23STCCST43	Sampling Techniques	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
18	IV	23STP7ST41	Sampling Techniques - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
19	IV	23STCCDE43	Design & Analysis of Experiments	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO3,PSO4	PO1,PO2,PO3,PO4
20	IV	23STP8DE41	Design & Analysis of Experiments-Practica l	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
21	IV	23STCCNA43	Numerical Analysis	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
22	IV	23STP9NA41	Numerical Analysis - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4

				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
23	IV	23STCCQC44	Statistical Quality Control	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
24	IV	23MDCBS2	Basic Statistics	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
25	V	23STCCAS53	Applied Statistics	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
26	V	23STP10AS51	Applied Statistics - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
27	V	23STCCCR53	Computational Statistics & R Programming	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
28	V	23STP11CR51	Computational Statistics & R Programming - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5

				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
29	V	23STEC11OR53	Operations Research	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
30	V	23STP1211OR51	Operations Research - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
31	V	23STEC12QC53	Statistical Quality Control	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
32	V	23STP1312QC51	Statistical Quality Control - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
33	V	23STEC21OT53	Optimization Techniques	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
34	V	23MTP1421OT51	Optimization Techniques - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5

				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4,PO5
35	V	23STEC22AS53	Applied Statistics II	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
36	V	23MTP1522AS51	Applied Statistics II - Practical	CO1	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO2	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4
				CO3	PSO1,PSO2, PSO 3,PSO4	PO1,PO2,PO3,PO4

Mapping of Courses with PSOs

S. No.	Semester	Course	PSO1	PSO2	PSO3	PSO4
1	I	23SCCCEA14	✔	✔	✔	✔
2	I	23SCCCAS14	✔	✔	✔	✔
3	II	23STCCDS23	✔	✔	✔	✔
4	II	23STP1DS21	✔	✔	✔	✔
5	II	23STCCME23	✔	✔	✔	✔
6	II	23STP2ME21	✔	✔	✔	✔
7	II	23STCCSM24	✔	✔	✔	✔
8	III	23STCCDD33	✔	✔	✔	✔
9	III	23STP3DD31	✔	✔	✔	✔
10	III	23STCCCD33	✔	✔	✔	✔
11	III	23STP4CD31	✔	✔	✔	✔
12	III	23STCCSM33	✔	✔	✔	✔
13	III	23STP5SM31	✔	✔	✔	✔
14	III	23STCCIS33	✔	✔	✔	✔
15	III	23STP6IS31	✔	✔	✔	✔
16	III	23STCCRM34	✔	✔	✔	✔
17	IV	23STCCST43	✔	✔	✔	✔
18	IV	23STP7ST41	✔	✔	✔	✔
19	IV	23STCCDE43	✔	✔	✔	✔
20	IV	23STP8DE41	✔	✔	✔	✔
21	IV	23STCCNA43	✔	✔	✔	✔
22	IV	23STP9NA41	✔	✔	✔	✔
23	IV	23STCCQC44	✔	✔	✔	✔
24	IV	23MDCBS2	✔	✔	✔	✔
25	V	23STCCAS53	✔	✔	✔	✔
26	V	23STP10AS51	✔	✔	✔	✔

27	V	23STCCCR53	✔	✔	✔	✔
28	V	23STP11CR51	✔	✔	✔	✔
29	V	23STEC11OR53	✔	✔	✔	✔
30	V	23STP1211OR51	✔	✔	✔	✔
31	V	23STEC12QC53	✔	✔	✔	✔
32	V	23STP1312QC51	✔	✔	✔	✔
33	V	23STEC21OT53	✔	✔	✔	✔
34	V	23STP1421OT51	✔	✔	✔	✔
35	V	23STEC22AS53	✔	✔	✔	✔
36	V	23STP1522AS51	✔	✔	✔	✔

Mapping of Courses with POs

S. No.	Semester	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
1	I	23SCCCEA14	✔	✔	✔	✔	-	-	-	-
2	I	23SCCCAS14	✔	✔	✔	✔	-	-	-	-
3	II	23STCCDS23	✔	✔	✔	✔	-	-	-	-
4	II	23STP1DS21	✔	✔	✔	✔	-	-	-	-
5	II	23STCCME23	✔	✔	✔	✔	-	-	-	-
6	II	23STP2ME21	✔	✔	✔	✔	-	-	-	-
7	II	23STCCSM24	✔	✔	✔	✔	-	-	-	-
8	III	23STCCDD33	✔	✔	✔	✔	-	-	-	-
9	III	23STP3DD31	✔	✔	✔	✔	-	-	-	-
10	III	23STCCCD33	✔	✔	✔	✔	-	-	-	-
11	III	23STP4CD31	✔	✔	✔	✔	-	-	-	-
12	III	23STCCSM33	✔	✔	✔	✔	-	-	-	-
13	III	23STP5SM31	✔	✔	✔	✔	-	-	-	-
14	III	23STCCIS33	✔	✔	✔	✔	-	-	-	-
15	III	23STP6IS31	✔	✔	✔	✔	-	-	-	-
16	III	23STCCRM34	✔	✔	✔	✔	-	-	-	-
17	IV	23STCCST43	✔	✔	✔	✔	-	-	-	-
18	IV	23STP7ST41	✔	✔	✔	✔	-	-	-	-
19	IV	23STCCDE43	✔	✔	✔	✔	-	-	-	-
20	IV	23STP8DE41	✔	✔	✔	✔	-	-	-	-
21	IV	23STCCNA43	✔	✔	✔	✔	-	-	-	-
22	IV	23STP9NA41	✔	✔	✔	✔	-	-	-	-
23	IV	23STCCQC44	✔	✔	✔	✔	-	-	-	-
24	IV	23MDCBS2	✔	✔	✔	✔	-	-	-	-
25	V	23STCCAS53	✔	✔	✔	✔	-	-	-	-
26	V	23STP10AS51	✔	✔	✔	✔	-	-	-	-

27	V	23STCCCR53	✔	✔	✔	✔	✔	-	-	-
28	V	23STP11CR51	✔	✔	✔	✔	✔	-	-	-
29	V	23STEC11OR53	✔	✔	✔	✔	✔	-	-	-
30	V	23STP1211OR51	✔	✔	✔	✔	✔	-	-	-
31	V	23STEC12QC53	✔	✔	✔	✔	✔	-	-	-
32	V	23STP1312QC51	✔	✔	✔	✔	✔	-	-	-
33	V	23STEC21OT53	✔	✔	✔	✔	✔	-	-	-
34	V	23STP1421OT51	✔	✔	✔	✔	✔	-	-	-
35	V	23STEC22AS53	✔	✔	✔	✔	-	-	-	-
36	V	23STP1522AS51	✔	✔	✔	✔	-	-	-	-