



SARDAR PATEL UNIVERSITY
NAAC 'A' Grade (10-01-2023 To 09-01-2028)
Vallabh Vidyanagar
Gujarat

Academic Program Structure
&
Curriculum
(Aligned with NEP-2020)

Bachelor of Science Statistical Science

NHEQF Level: 6

Entry NHEQF Level	:	5
Duration	:	Four Years (Eight Semesters)
Total Courses	:	50
Total Learning Hours	:	5,280
Total Credits	:	176
Total Marks	:	4,400



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Graduate Attributes (GAs)

Upon successful completion of the B.Sc. programme, graduates are expected to attain the following Graduate Attributes:

GA1. Disciplinary Knowledge

Demonstrate comprehensive understanding of statistical theory, probability, and inferential methods.

GA2. Statistical Computing

Proficiency in programming languages for data manipulation, visualization, and analysis, while bridging the gap between raw data, complex statistical modeling, and actionable business decisions.

GA3. Data Analysis and Modelling

Expertise in building, assessing, and refining statistical models to solve real-world problems.

GA4. Critical Thinking and Problem Solving

Ability to translate abstract scientific questions into statistical inquiries and work with uncertainty.

GA5. Communication and Data Visualization

Skill in communicating complex statistical ideas, findings, and uncertainty to both technical and non-technical audiences, using visualization tools.

GA6. Ethical Practice

Maintaining integrity, honesty, and understanding the ethical implications of data privacy, confidentiality, and algorithmic bias.

GA7. Research and Independent Inquiry

Capability to independently research and apply new statistical methods in a rapidly evolving field.

GA8. Collaboration

Collaborate effectively with non-statistical experts, such as researchers, data engineers, and stakeholders, to understand their requirements and provide analytical insights.

GA10. Statistical consultancy

Work respectfully with diverse teams and perspective utilizing collaborative tools and platforms to conduct joint projects.

GA12. Analytical Reasoning and Synthesizing Information

Ability to formulate research questions, design experiments, surveys, and evaluate the reliability of data, identifying logical flaws in arguments.

GA13. Communication and Data Storytelling

Converting insights into easy-to-understand visual forms, such as graphs and dashboards, for stakeholders and communicate in a story telling form.



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Program Educational Objectives (PEOs):

Within 3-5 years of completing the B.Sc. programme, graduates will be able to:

- PEO1. Apply statistical techniques combined with proficiency in data structures and algorithms to analyze complex datasets and solve real-world problems in diverse fields such as biology, economics, and government, facilitating data-driven decision-making.
- PEO2. Integrate economic theory with data analytics to provide actionable insight for decision-making incorporate government and financial sectors.
- PEO3. Use statistical software and programming languages for data extraction, manipulation, processing and visualization.
- PEO4. Pursue career as analysts, researchers, consultants or higher studies in statistics or economics.
- PEO5. Function effectively as team members or leaders, adhering to ethical standard in data management and professional practices.
- PEO6. Adapt to new methodology and technology in the rapidly evolving fields of data science and economics.



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Program Learning Outcomes (PLOs):

Upon successful completion of the B. Sc. Programme learners will be able to:

- PLO 1. Demonstrate comprehensive knowledge of probability theory, statistical inference, official statistics to analyze data sets across diverse fields.
- PLO 2. Design and implement efficient algorithms and data structures using MS Excel, SPSS, Python, R and SAS to manage, manipulate, and analyze large datasets.
- PLO 3. Apply specialized statistical models to real-world problems in biology, pharmaceutical science, economics and government data.
- PLO 4. Visualize data effectively and communicate complex statistical findings and modeling results using Power BI.
- PLO 5. Formulate research problems, design appropriate methodology and evaluate academic or industry literature using rigorous statistical tools.
- PLO 6. Identify, analyze, and solve complex, unstructured problems by applying appropriate statistical methodologies and computational tools.
- PLO 7. Engaging continuous learning, higher education and professional development in statistics, data science, economics and related field.
- PLO 8. Collaborate effectively in interdisciplinary teams, applying statistical expertise to contribute to projects in science, industry, and policy.
- PLO 9. Analyze Government and Public Sector categorical data and assess the quality of a statistical analysis for decision-making.
- PLO 10. Communicate technical findings clearly to non-specialist audiences through narrative reports and interactive visual tools.
- PLO 11. Evaluate the ethical implications of data collection and algorithmic bias, particularly when handling sensitive biological or governmental information.



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Semester-I

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits /hour/ week	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
Major	US01MASTS01	Data Structures and Algorithms	4-0-0	120	4/4	25	25	50	50	100
Major	US01MASTS02	Elements of Statistics	4-0-0	120	4/4	25	25	50	50	100
Minor	US01MISTS01	Fundamentals of Economics - I	4-0-0	120	4/4	25	25	50	50	100
MD	US01MDSTS01	Set Theory and Calculus	4-0-0	120	4/4	25	25	50	50	100
AEC	US01AESTS01	Functional English - I	2-0-0	60	2/2	15	10	25	25	50
SEC	US01SESTS01	Computer Applications for Economics	0-2-0	60	2/3	15	10	25	25	50
VAC/IKS	US01IKSTS01	Kautilya’s Arthashastra	2-0-0	60	2/2	15	10	25	25	50
				660	22			350	200	550

Major: Discipline Specific Major **Minor** **MD:** Multidisciplinary Course **AEC:** Ability Enhancement Course **SEC:** Skill Enhance Course

VAC: Value Enhancement Course **IKS:** Indian Knowledge System

L: Lecture **P:** Practical **T:** Tutorial **FA:** Formative Assessment **SA:** Summative Assessment



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Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits/ hour/ week	Assessment Scheme & Marks				
			L-P-T	Total Notio nal Hour s		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
Major	US02MASTS01	Research Methodology	4-0-0	120	4/4	25	25	50	50	100
Major	US02MASTS02	Elements of Probability and Discrete Distributions	4-0-0	120	4/4	25	25	50	50	100
Minor	US02MISTS01	Fundamentals of Economics -II	4-0-0	120	4/4	25	25	50	50	100
MD	US02MDSTS01	Vectors and Matrices	4-0-0	120	4/4	25	25	50	50	100
AEC	US02AESTS01	Functional English – II	2-0-0	60	2/4	15	10	25	25	50
SEC	US02SESTS01	Descriptive Statistics using MS Excel	0-2-0	60	2/4	15	10	25	25	50
VAC/IKS	US02VASTS01	Fundamentals of Financial Literacy	2-0-0	60	2/2	15	10	25	25	50
				660	22			300	250	550

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