



**M.Sc. in Statistics**  
**with specialization in**  
**Industrial Statistics/ Business Analytics / Biostatistics**

Faculty of Science  
Department of Statistics  
St. Xavier's University, Kolkata

## **Programme Educational Objectives**

PEO 1: To introduce students to the meaning, concepts and scope of the basic Statistical and Mathematical tools applicable for decision-making.

PEO 2: To familiarize students with the different tools and techniques used for collecting, handling, and managing and interpreting data.

PEO 3: To make the students acquainted with methods of data analysis and interpretation with focus on statistical tools.

PEO 4: To enable students to perform data visualization and analysis using modern statistical software packages such as Python, SPSS, R etc.

PEO 5: To enable students to get familiarized with different techniques of data driven statistical inference.

PEO 6: To encourage students towards various types of research and methodologies of conducting research.

## **Programme Outcomes**

PO 1: Understanding the basic Statistical and Mathematical tools applicable for decision-making.

PO 2: Designing questionnaires or perform other survey methods to collect data from primary sources supporting independent research initiatives.

PO 3: Applying advanced quantitative and statistical tools envisaged in the course in collecting, analyzing and interpreting data.

PO 4: Using statistical software packages in the process of generation of graphs, charts, and other forms of data visualization, data analysis and data interpretation.

PO 5: Enabling to independently solve real life problems.

PO 6: Assisting the policy makers in framing plans on different aspects of national development.

PO 7: Understanding and predicting the movement different data series related to industry, business and healthcare.

**Proposed Curriculum for M.Sc. Statistics**  
**Drafted by Expert Committee**

**Total number of Credits: 96**

**Total Number of Papers: 25**

**Core Papers: 22**

**Electives: 3**

**Semester wise Details**

<b>Semester –I</b>						
<b>Number of Papers: 6</b>						
Course code	Course Title	Course Type	Credits in each course			
			Theory	Practical	Tutorial	Credits
MSTC 101	Mathematical Analysis	Core	4	0	0	4
MSTC 102	Probability Theory	Core	4	0	0	4
MSTC 103	Statistical Inference-I (Estimation Theory / Hypothesis Testing)	Core	3	1	0	4
MSTC 104	Linear Algebra & Linear Models	Core	3	1	0	4
MSTC 105	Sampling Techniques	Core	3	1	0	4
MSTC 106	R Programming	Core	0	4	0	4
<b>Total credits</b>			<b>17</b>	<b>7</b>	<b>0</b>	<b>24</b>

**Semester –II**

<b>Number of Papers: 6</b>						
Course code	Course Title	Course Type	Credits in each course			
			Theory	Practical	Tutorial	Credits
MSTC 201	Multivariate Analysis	Core	3	1	0	4
MSTC 202	Stochastic Processes	Core	4	0	0	4
MSTC 203	Statistical Inference II (Large sample Theory/Nonparametric Methods)	Core	3	1	0	4
MSTC 204	Regression Analysis I	Core	3	1	0	4
MSTC 205	Design of Experiments	Core	3	1	0	4
MSTP 206	Python	Core	0	4	0	4
<b>Total Credits</b>			<b>16</b>	<b>8</b>	<b>0</b>	<b>24</b>

**Semester –III**

<b>Number of Papers: 7</b>						
Course code	Course Title	Course Type	Credits in each course			
			Theory	Practical	Tutorial	Credits
MSTC 301	Bayesian Inference	Core	2	1	0	3
MSTC 302	Applied Multivariate Analysis	Core	3	1	0	4
MSTC 303	Regression Analysis II	Core	3	1	0	4
MSTC 304	Time Series Analysis	Core	2	1	0	3
MSTC 305	Advanced Data Analytic Techniques (Resampling Techniques/ Missing Data/Longitudinal Data)	Core	3	1	0	4
MSTP 306	Elective1	Core	3	1	0	4
MSTP 307	Internship/Mini Project	Core	0	0	2	2
<b>Total Credits</b>			<b>16</b>	<b>7</b>	<b>1</b>	<b>24</b>

**Semester –IV**

<b>Number of Papers: 6</b>						
Course code	Course Title	Course Type	Credits in each course			
			Theory	Practical	Tutorial	Credits
MSTC 401	Statistical Analysis of Big Data	Core	3	1	0	4
MSTC 402	Development Statistics	Core	2	0	0	2
MSTC 403	Elective 2	Elective	3	1	0	4
MSTC 404	Elective 3	Elective	3	1	0	4
MSTC 405	Elective 4	Elective	3	1	0	4
MSTP 406	Project	Core	0	0	6	6
<b>Total Credits</b>			<b>14</b>	<b>10</b>		<b>24</b>

*Elective 1 : Demography, Actuarial Statistics, Optimization Techniques*

*Electives 2, 3 and 4 from any one of the following modules*

**Module 1 : Industrial Statistics**

1. *Operations Research*
2. *Reliability Theory*
3. *Statistical Quality Management*

**Module 2 : Business Analytics**

1. *Econometrics*
2. *Financial Time series*
3. *Machine Learning in Finance / Financial Econometrics*

**Module 3 : Biostatistics**

1. *Survival Analysis*
2. *Clinical Trials*
3. *Statistical Genetics / Epidemiology*