



**ST. XAVIER'S COLLEGE – MUMBAI**

**(Est. 1869)**

**(An Autonomous College affiliated with the University of  
Mumbai)**

**Syllabus for Postgraduate Programme as per  
National Education Policy (NEP-2020)**

**Programme: M.Sc**

**Big Data Analytics**

**The academic year 2023–2024**



PRINCIPAL  
ST. XAVIER'S COLLEGE  
AUTONOMOUS  
MUMBAI - 400 001.

**APPROVED SYLLABUS**

**Preamble:**

The National Education Policy 2020 (NEP 2020), as put forth by the Ministry of Human Resource Development (MHRD), is anchored in a set of fundamental principles.

These principles serve as the guiding tenets of the education system and encompass the following key elements:

NEP 2020 advocates for a student-centric approach to education, offering a broad spectrum of courses with emphasis placed on outcome-based learning, ensuring a well-rounded education.

Half of the coursework is designed for conceptual and theoretical understanding, with the other half dedicated to practical application through student engagement in activities, apprenticeships, and internships. Pedagogical methods prioritize problem-centered and project-based learning and activities.

NEP 2020 promotes the integration of technology into teaching, learning, and evaluation processes. It also highlights the need to strengthen research pedagogy within each discipline. The policy emphasizes the integration of skilling and employability initiatives into the curriculum and teaching-learning processes. This integration helps to prepare students for real-world employment opportunities.

NEP 2020 supports flexibility within academic programs, allowing students to exit after every year. Credit transfer mechanisms and the accumulation of credits in the Academic Bank of Credits (ABC) provide learners with options to tailor their educational journey according to their needs and aspirations. The overarching goal of NEP 2020 is to achieve equality in education. To do so, it recognizes equity as a process that fosters inclusivity and ensures that all students feel a sense of belonging in the educational system.

**The framework of the choice-based credit system**

**Major Subject:** It is the primary area of specialization that a student chooses to focus on during their postgraduate studies. It forms the core of their curriculum, allowing them to delve deeply into a specific field of knowledge and build expertise in that particular subject area.

**Elective Course:** Students can choose to study from a list of available options, often as part of their PG degree requirements. These courses provide students with the flexibility to select topics that cater to their interests, academic objectives, and career goals.

**Research Methodology:** In research methodology, students will explore advanced techniques and approaches for conducting rigorous academic research. This comprehensive study will equip them with the skills and knowledge needed to design, implement, and analyze research studies in their respective fields of study.

**On-Job Training (OJT)/Internship/Field Project (FP)/Research Project (RP)/Dissertation:** These are essential components of experiential learning in higher education. These hands-on

© St. Xavier's College (Autonomous), Mumbai, INDIA

experiences provide students with practical exposure, allowing them to apply theoretical knowledge in real-world contexts, thereby fostering skill development and deepening their understanding of their chosen fields.

### Credit Framework

IT/Biotech/Phy PGPCredit Structure for 2023-24								
Level	Sem	Major		RM	OJT, FP	RP	Cum Cr/Sem	Degree/Cum Cr
		Mandatory	Elective					
6 (2023-24)	Sem 1	14	4	4	0	0	22	PG Diploma after TY
	Sem 2	14	4	0	4	0	22	
	Cum Cr	28	8	4	4	0	44	
6.5 (2024-)	Sem 3	12	4	0	0	6	22	PG Degree after TY or after FYUG
	Sem 4	0	0	0	0	22	22	
	Cum Cr	12	4	0	0	28	44	
<b>88 credits (2 years) after TY or 44 credits (1 year) after FYUGP</b>								



**Programme Outcomes aligned to the Vision and Mission of St. Xavier's College (Autonomous), Mumbai (Master's degree programme)**

The completion of a two-year post-graduation program at St. Xavier's College equips students with a range of valuable skills and competencies.

1. Disciplinary knowledge and Core competencies/skills:
  - Gain a deep understanding of the subject-related curriculum.
  - Demonstrate advanced skills and knowledge in their academic field of study.
2. Critical and Creative thinking:
  - Reflect critically on acquired knowledge and skills within their core competencies.
  - Generate creative and resourceful ideas to explore new possibilities.
3. Problem-solving and Analytical reasoning:
  - Identify, investigate, and analyze problems effectively.
  - Collect and interpret relevant qualitative or quantitative data.
  - Formulate evidence-based solutions based on their analysis.
4. Research-related skills:
  - Apply research acumen and skills in identifying research issues.
  - Design research studies and interpret the results.
  - Communicate the findings of their studies effectively and accurately.
5. Social Application of Research and Development:
  - Utilize their core competencies and skills to improve social and environmental conditions.
6. Industry-related skills:
  - Acquire skills and techniques relevant to their chosen industry.
  - Demonstrate maturity and professional ethics in managing responsibilities.
7. Ethical and Moral Integrity:
  - Practice values such as honesty, transparency, and accountability.
  - Commit to interpersonal and social ethics.
8. Collaboration, Teamwork, and Multidisciplinary competence:

- Apply their knowledge and mentoring skills in individual, team, or leadership roles.
- Manage ventures in monodisciplinary, interdisciplinary, or multidisciplinary settings.

9. Leadership and Management:

- Demonstrate effective strategic planning skills.
- Exhibit efficient organizational and transformational leadership abilities.

10. Social Concern:

- Show empathy and care for marginalized and disadvantaged individuals.
- Display respect, compassion, and concern for others.

11. Social and Environmental Well-being:

- Investigate and design strategies to enhance the well-being of society and the environment.

12. Self-motivation and Lifelong learning:

- Cultivate a passion for continuous personal and professional growth.

These outcomes reflect the holistic approach taken by St. Xavier's College to develop well-rounded individuals who are equipped to contribute positively to society, exhibit strong leadership qualities, and adapt to the demands of a dynamic world.

**Abbreviations:**

- OJT: On-job training
- RP: Research Project
- FP: Field Project

**List of Courses offered from Semesters I-IV in M.Sc Big Data Analytics**

Level	Semester	Major Course titles	Elective Course titles	OJT	RP	FP	PR
6.0	Sem I	Linear Algebra and Linear Programming Probability and Stochastic Processes Data Base Management - Relational Basics of Programming	Computing for Data science Data Structures		Research Methodology and Statistical Methods		
	Sem II	Foundation of Data science Advanced Statistical Methods Machine Learning-I Enabling Technologies-I	Operation Research Linux and Cloud Computing Fundamentals				Value Thinking
6.5	Sem III						
	Sem IV						

**Composition of the Board of Studies in Information Technology 2023 – 2024**

<b>Representation</b>	<b>Name</b>	<b>Affiliation</b>
<b>Chairperson: Head of the Department</b>	Roy Thomas	St. Xavier's College
<b>Department faculty members</b>	Subhash Kumar	St. Xavier's College
	Lydia Fernandes	St. Xavier's College
	Aaron Johns	St. Xavier's College
	Dr. Jojan Mathai	St. Xavier's College
<b>VC nominee</b>	Dr. Jyotsna D	Mumbai University
<b>Industry Expert</b>	Mr. Joyson Dsouza	Dream 11
<b>Subject Experts from other Universities</b>	Dr. Seema Shah	NMIMS
	Dr. Paritosh Pandya	IIT Mumbai
<b>Experts from outside the college (co-opted)</b>	Dr. Hiren Dand	MCC College
<b>Other members of staff of the same faculty</b>	Dr. Annapurna S	St. Xavier's College
<b>Postgraduate meritorious alumnus</b>	Miss. Urmi Narsule	TCS

**Two-Year Postgraduate Programme in M.Sc Big Data Analytics**

<b>Year of Implementation</b>	<b>Semester</b>	<b>Course Code</b>	<b>BOS Date</b>	<b>Academic Council Date</b>
2023-2024	I	PSBDA6001CR1	18/03/2023	21/04/2023
		PSBDA6002CR1	29/06/2023	
2023-2024	II	PSBDA6003CR1	30/09/2023	06/10/2023
		PSBDA6004CR1		
		PSBDA6001EL1		
		PSBDA6002EL1		
		PSBDA6001RM1		
		PSBDA6005CR1		
		PSBDA6006CR1		
		PSBDA6007CR1		
		PSBDA6008CR1		
		PSBDA6003EL1		
		PSBDA6004EL1		
		PSBDA6501PR1		



## Programme: M.Sc. Big Data Analytics

### Programme Specific Outcomes (PSOs) for M.Sc. Big Data Analytics

Sr. No.	On completing M.Sc. Big Data Analytics, the student will be able to:
PSO 1	Acquire analytical and problem-solving skills, in order to solve real-world problems.
PSO 2	Acquire the skill of developing predicting and clustering model
PSO 3	Understand the concepts of statistics in order to develop analytical skills
PSO 4	Acquire the skills of data extraction, data cleansing, and data transformation.
PSO 5	Acquire the skill of database management system
PSO 6	Acquire the skill of big data analytics.
PSO 7	Acquire the skill of optimization
PSO 8	Acquire the skill of developing a business model
PSO 9	Develop the skill of logical reasoning.
PSO 10	Gain an aptitude for programming and troubleshooting independently.
PSO 11	Acquire the skill of data visualization.
PSO 12	Acquire the skill of Java and Scala Programming
PSO 13	Acquire the skill of using big data tools and technologies such as Hadoop, Spark, and NoSQL databases to manage and analyze massive datasets.
PSO 14	Acquire the skills in understanding and applying a wide range of research methodologies and techniques.
PSO 15	Acquire the skills to develop and present comprehensive research proposals, including clear research objectives, methodology, and anticipated outcomes.
PSO 16	Acquire the skills of deploying applications and services in the cloud, managing cloud resources, and optimizing cost-effective solutions.
PSO 17	Acquire the skills of using the Linux operating system and also to deploy and manage virtual machines and containers in a cloud environment.
PSO 18	Acquire the skills of Python and R programming

SXCM/Department of Information Technology /NEP/2023-2024

© St. Xavier's College (Autonomous), Mumbai, INDIA

**APPROVED SYLLABUS**