



Rooted in and inspired by the Ignatian charism of forming men and women for others, St. Xavier's University, Kolkata, as a Centre of Excellence, strives to promote a society based on love, freedom, liberty, justice, equality and fraternity.

#### Mission:

- ✓ To set an international standard for Arts, Science, Commerce, Management education contemporary and relevant to the 21st century.
- ✓ To provide all students at St. Xavier's University a unique and exceptional education that will be a transforming experience intellectually, culturally, socially and personally.
- ✓ To excel in all areas of teaching-learning, research, outreach and consultancy.
- ✓ To contribute to the creation of knowledge and to search for the meaning of life.
- ✓ To bridge the rural-urban divide, taking the benefits of education to the poor and the marginalized, aiming at their empowerment.
- ✓ To ensure access to and equity in higher educational opportunity to all deserving and meritorious students with a preferential option for the poor and marginalized, irrespective of caste and creed.
- ✓ To inspire and challenge all segments of the University to raise the realm of good from great to greater, through continuous quality assessment;
- ✓ To offer subjects for competence building, and to motivate/animate a work force imbued with human values.
- ✓ To become a Centre of culture and to consciously promote communal harmony and cultural integration so as to create an atmosphere of dialogue in the campus.
- ✓ To promote academic exchange and academia-industry interfacing, making use of the latest technology.
- ✓ To develop application-oriented courses, with the mandatory view on values, to produce holistic development of persons.
- ✓ To form young men and women of competence, commitment, conscience and compassion.
- ✓ To contribute to the well-being of the nation without counting the cost; in the spirit of *NIHIL ULTRA* (*Nothing Beyond*), the motto of St. Xavier's University, Kolkata.

## Studying at SXUK

- Jesuit Education
- State-of-the-art Infrastructure
- Committed Faculty Members
- Industry ready Curriculum
- Scholarship for Students
- \* Research Oriented Approach
- Good Student-Teacher Ratio
- Holistic Approach



## Vice-Chancellor's Message

A warm and affectionate welcome to all students who aspire to be a part of the intellectual fraternity of St. Xavier's University, Kolkata. This is the start of your academic journey that is bound to give you quality for your bright future.

As a Jesuit University, we are focusing on quality outcomes in access, pedagogy, research, consultancy, innovation in education, enrolment of students and their employability. This University reaches out to everyone, thus maintaining the vision of equity. We are in the process of continuously augmenting our infrastructure with adding new buildings, sports facilities, cafeteria, state-of-the-art classrooms, laboratory, and library. We constantly focus on academic leadership and constructive outcomes.

The University is working tirelessly for academic expansion and diversification, widening the academic canvass in horizontal and vertical dimensions. The knowledge standards of the campus have been meeting intellectual requirements of the society.

It is my pleasure to extend a hearty welcome to all the students, faculty and staff members. May God bless you all to emerge stronger, wiser and build a better world.

Nihil Ultra! Rev. Dr. John Felix Raj, S.J.

## Dean's Message



Welcome to St. Xavier's University, Kolkata! As the Dean of the Faculty of Science, I am extremely happy and proud of the rich tradition of providing practical, experiential – based education that our departments have upheld since its inception. Our post graduate programs in Computer Science and

Statistics prepare our students empowering them to become "men and women for others" who will be agents of needed social change in our country and eventually in the world.

Moreover, the Jesuit education inspired by the Ignatian charism moulds our students to become leaders with the moral depth and intellectual intensity necessary to face the challenges of today. Located in an economic and cultural hub, the St. Xavier's University, Kolkata offers unique opportunities for our students to engage with IT companies and communities.

Therefore, I would be immensely happy to invite all of you who are interested in expanding your knowledge and enriching your careers to explore our departments further either online or through a visit to our campus. I do hope, you will certainly join our community of life-long learners.

May God bless you! Rev. Dr. A. Arockiasamy, S.J.



## Message from the Heads



I, on behalf of Department of Computer Science welcome you to be a part of the thriving computer science community and become visionaries and change makers of the future. The Department of Computer Science came into existence from 2nd August 2022. Our distinguished faculty

members ensure a wide range of diverse learning experiences ranging from the fundamentals of Computer Science, Core Courses, Programming, Emerging Technologies like Data Analytics, Artificial Intelligence, Machine Learning, Cyber security etc.

We, as a team sincerely welcome the young talent who aspire to pursue studies, to educate, or to innovate in Computer Science. So come and join us.

Dr. Tuhin Utsab Paul Associate Professor & HoD **Department of Computer Science** 



I heartily welcome the students to the Department of Statistics at the esteemed St. Xavier's University, Kolkata. The department offers a comprehensive 2year M.Sc. programme in Statistics, with a choice of specialisation in Industrial Statistics, Biostatistics, or Business Analytics. To enrich our students'

learning experience, we arrange workshops and invite eminent statisticians and industry experts to deliver special lectures.

The department's primary goal is to foster excellence and provide an exceptional educational environment, guided by our highly qualified and experienced faculty members. We encourage students to think independently and prepare them to pursue their chosen career paths.

I extend my best wishes to all prospective students for a successful academic journey ahead. Prof. (Dr.) Manisha Pal **Senior Professor & HoD** Courses Offered

**Department of Statistics** 

## Department of Computer Science

M.Sc. in Computer Science with specialization in:

Networking and Cyber Security

Data Analytics



### Department of Statistics

#### M.Sc. in Statistics with specialization in:

- Industrial Statistics
- Business Analytics
- **\*** Biostatistics





## About the Departments

#### Department of Computer Science

The Department of Computer Science has begun from August 2022, with M.Sc. in Computer Science program. The curriculum is prepared to suit the latest requirements of the industry and research organisations. Seminars, workshops and invited lectures are organised on a regular basis to keep up with the latest trends and technologies. The Department is committed to its endeavour to deliver the best and groom men and women who would in future ensure that St. Xavier's University, Kolkata keeps on shining in the academic and industrial world. We strive to produce computer professionals with sound technical and analytic brain, possessing a human face, who would contribute to the building of our Nation.

# Highlights of the Department

- Industry Ready Curriculum
- Master Degree with Specialisation
- > High Industry Requirement
- Lab Oriented Program
- Project & Internship



#### Department of Statistics

The Department of Statistics started its operations from August 2022 with M.Sc. in Statistics. The Department imparts extensive theoretical knowledge and rigorous practical training to its students through a multi-faceted teaching system. The curriculum has been prepared with the requirements of the industry and related research organisations in mind, to offer a well-rounded academic programme. The Department has a well-equipped laboratory with state-of-the-art computing facilities and has plans to further its knowledge base through seminars and workshops that will benefit students and faculty alike and help them keep up with the latest trends and technologies.

### Highlights of the Department

- Comprehensive Curriculum
- Experienced Faculties
- Specialised Buckets of Courses
- Internships & Job Opportunities
- Well Equipped Computer Lab





Rev. Dr. A. Arockiasamy, S.J. Professor & Dean Faculty of Science



Rev. Dr. Maria Joseph Israel, S.J. Assistant Professor



Dr. Suvendu Chattaraj Assistant Professor



Dr. Abhijit Biswas Assistant Professor



Dr. Chayanika Mitra Assistant Professor

## Faculty Members



Prof. (Dr.) Manisha Pal Senior Professor & Head Department of Statistics



Dr. Utpal Pore Assistant Professor



Dr. Priyanka Talukdar Assistant Professor



Dr. Aniket Biswas Assistant Professor



Mr. Malay Mitra IT Coordinator

**Dr. Tuhin Utsab Paul** Associate Professor & Head Department of Computer Science



**Dr. Savan Das** Assistant Professor



Dr. Mrinmoyee Bhattacharya Assistant Professor



**Dr. Tanushree Biswas** Assistant Professor

### Visiting Faculty Members

- Prof. Sugata Sen Roy, Professor, University of Calcutta
- **Prof. Rahul Bhattacharya,** Professor, University of Calcutta

- Prof. Bhaswati Ganguli, Professor, University of Calcutta
- Dr. Bikromadittya Mondal, Associate Professor, BPPIMT, Kolkata

• Dr. Sanghamitra Pal, Assistant Professor, West Bengal State University



# Curriculum of Computer Science

Semester - I			
Course Code	Course Title	Type	
MCSR110C	Advanced Analysis of Algorithms	Th + Pr	
MCSR120C	Distributed System	Th + Pr	
MCSR130T	Automata and Compiler Design	Th	
MCSR140C	Statistical Analysis using Python	Th + Pr	
MCSR150C	Artificial Intelligence and Soft Computing	Th + Pr	

Semester - III				
Course Code	Course Code Course Title			
MCSR310C	Computer Vision	Th + Pr		
MCSR320C	Data Warehouse and Mining	Th + Pr		
MCSR330T	Mobile and wireless Computing	Th		
MCSR360P	Smart Analytics System Design Lab	Pr		
MCSR370J	Project – Phase 1 Project			
Specialization Bucket: 01 (Networking and Cyber Security)				
MCSR341T	Cloud Computing	Th		
MCSR351T	Network Security	111		
Specialization Bucket: 02 (Data Analytics)				
MCSR342T	Business Intelligence	Th		
MCSR352T	Deep Learning	1 11		

	Semester - II				
Course Code Course Title		Туре			
	MCSR210C	Cryptography and Cryptanalysis	Th + Pr		
	MCSR220C	Machine Learning	Th + Pr		
	MCSR230C	Embedded and Real Time Systems	Th + Pr		
	MCSR240C	Advanced Software Engineering	Th + Pr		
	MCSR250C	Operation Research and Research Methodology	Th + Pr		

Semester - IV						
Course Code Course Title Type						
MCSR440J	Term Paper	Project				
MCSR450J	Project – Phase II **	Project				
MCSR460V	General Viva-Voce	Viva				
Specialization B	Specialization Bucket: 01 (Networking and Cyber Security)					
MCSR411T	Cyber Law and Ethics					
MCSR421T	Security for Cyber Physical system	Th				
MCSR431T	IOT and Smart Systems					
Specialization B	ucket: 02 (Data Analytics)					
MCSR412T	Bio-informatics					
MCSR422T	NLP and Text Analytics	Th				
MCSR432T	Social Network Analytics					

Th - Theory

<sup>\*\*</sup> Publication of at least ONE research paper in UGC recognized Journal is Desirable.



## Curriculum of Statistics

Semester - I			
Course Code Course Title Type			
MSTR110T	Mathematical Analysis	Th	
MSTR120T	Probability Theory	Th	
MSTR130C	Statistical Inference-I (Estimation Theory / Hypothesis Testing)	Th + Pr	
MSTR140C	Linear Algebra & Linear Models	Th + Pr	
MSTR150C	Sampling Techniques	Th + Pr	
MSTR160P	R Programming	Pr	

Semester - III				
Course Code	Course Code Course Title			
MSTR310C	Bayesian Inference	Th + Pr		
MSTR320C	Applied Multivariate Analysis	Th + Pr		
MSTR330C	Regression Analysis II	Th + Pr		
MSTR340C	Time Series Analysis and Development Statistics	Th + Pr		
MSTR350C	Advanced Data Analytic Techniques (Resampling Techniques / Missing Data / Longitudinal Data)	Th + Pr		
MSTR361C	Demography			
MSTR362C	Optimization Techniques	Th + Pr		
MSTR363C	Actuarial Statistics			
MSTR370J	Internship	Project		

	Semester - II				
Course (	Code	Course Title	Type		
MSTR21	ОТ	Stochastic Processes	Th		
MSTR22	0C	Multivariate Analysis	Th + Pr		
MSTR23	0C	Statistical Inference II (Large sample Theory / Nonparametric Methods)	Th + Pr		
MSTR24	OC	Regression Analysis I	Th + Pr		
MSTR25	0C	Design of Experiments	Th + Pr		
MSTR26	0P	Python	Pr		

Semester - IV						
Course Code	Course Code Course Title					
MSTR410C	Statistical Analysis of Big Data Th + P					
Specialization I	Bucket: 01 (Industrial Statistics)					
MSTR421C	Operations Research	Th + Pr				
MSTR431C	Reliability Theory	Th + Pr				
MSTR441C	Statistical Quality Management	Th + Pr				
Specialization	Specialization Bucket: 02 (Business Analytics)					
MSTR422C	Econometrics	Th + Pr				
MSTR432C	Financial Time Series	Th + Pr				
MSTR442C	Machine Learning in Finance / Financial Econometrics  Th + Pi					
Specialization	Bucket: 03 (Biostatistics)					
MSTR423C	Survival Analysis	Th + Pr				
MSTR433C	Clinical Trials	Th + Pr				
MSTR443C	Statistical Genetics / Epidemiology	Th + Pr				
MSTR450J	Project	Project				
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Students need to select any 1 specialization bucket



## Eligibility Criteria

#### M. Sc. in Computer Science

- ✓ B.Sc. Honours / Major in Computer Science / Information Technology / Computer and Information Science
- ✓ B.Tech in Computer Science / Information Technology / Electronics & Communication
- Bachelor of Computer Application (BCA)
- B.Sc. Honours / Major in Physics / Mathematics / Statistics / Electronics with Computer Science as general elective subject

#### M. Sc. in Statistics

- ✓ B.Sc. Honours / Major in Statistics
- ✓ B.Sc. Honours/Major in Mathematics and Statistics as general elective subject

## Admission Process

- Step 1 : Apply online in the University Portal.
  Application Link : https://www.sxuk.org/Default.aspx
- Step 2 : Give Online Admission Test. (Date is given in the Portal)
- > Step 3 : Check the Selection List put up in the University Website.
- Step 4 : If selected, pay Admission Fees online.
- > Step 5 : Physical verification of documents in the University.





### Fees Structure

- i. Application Fee: **₹1000** (Non-refundable)
- ii. Components of Fee Structure for Session 2024-2026 (All in Indian Rupee [₹])
  - Admission fee for all courses: ₹30,000 (excluding the candidate who has completed his/her graduation degree in St. Xavier's University, Kolkata)
  - Security deposit (refundable): **₹5,000** (to be paid at the time of admission)
  - Alumni membership fee: ₹5,015 (to be paid along with 4th semester course fees)

Course	Tuition Fee	Development Fee	Examination Fee	Library Fee	Sports & Students' Activities Fee	Total Fees (Per Semester)
M.Sc. in Statistics	54,000.00	7,000.00	2,500.00	1,500.00	1,000.00	66,000.00
M.Sc. in Computer Science	54,000.00	7,000.00	2,500.00	1,500.00	1,000.00	66,000.00

iii. Fee Refund Policy: As per UGC Notification, October 2018

## Scholarship

#### Merit-cum-Means Scholarships offered by the University:

- Loyola Scholarship (100% tuition fee waiver)
- Britto Scholarship (50% tuition fee waiver) ... & many more...
- Check Link: https://www.sxuk.edu.in/scholarship

#### Merit Based Scholarship\*:

- Criteria for 100% Tuition Fee Waiver: 75% or above marks in the UG Examination
- Criteria for 50% Tuition Fee Waiver: 65% or above but less than 75% marks in the UG Examination

#### Scholarships offered by the Govt.:

- Swami Vivekananda Merit-cum-Means Scholarship
- Aikyashree Scholarship
- Single Girl Child Scholarship

Students can also avail facility of West Bengal Student Credit Card Scheme.



## Internship

Our students have successfully completed Internships at various reputed organizations and institutions such as:

- Centre for Development of Advanced Computing (C-DAC), Govt. of India
- Indian Statistical Institute, Kolkata (ISI)
- Chittaranjan National Cancer Institute (CNCI)
- New Town Kolkata Development Authority (NKDA)
- University of Calcutta
- IEM Research & Development Private Limited

### **Placement**

The University hosts a placement cell, that functions actively in engaging student-industry exchange, and there are regular placement directives and sessions held during semesters. The cell is well equipped and committed to provide our students with best and vibrant opportunities of Internship and Placement.

60% students have already been placed in companies like:

**★**PWC **★** Inference Inc. **★** Kantar ... and continuing...

## Industry - Academia Collaboration

St. Xavier's University, Kolkata (SXUK) and WEBEL signed a Memorandum of Understanding (MoU) as part of Industry-Academia collaboration on May 31, 2023 at the university campus.

The MoU shall pave the way for using the Centre of Excellence, Industry 4.0 and Webel Animation Academy for the students, researchers, and faculty members of the university. The major thrust areas of the Centre of Excellence are Data Sciences and Cyber Security, 3D printing and Animation and VFX.

Students, Faculty members and research scholars may use the facilities at the Centre of Excellence.



# Thematic Discussions by Experts

Mr. Saurav Mukherjee, VP – Corporate Treasury, Goldman Sachs Topic: Analytics Life Cycle & its Application in Industry Topic: Scope of Interdisciplinary Study & Research in India &	☐ Dr. Raj Kumar Sharma, Prof. Satish Dhawan Scientist, SAC, ISRO <i>Topic: Remote Sensing Techniques and Applications</i>
Abroad	☐ Dr. Nitis Mukhopadhyay, Professor, Department of Statistics, University of Connecticut – Storrs, USA
Dr. Bikas K. Sinha, Retd. Professor, ISI, Kolkata	Topic: Sufficiency - Completeness - UMVUE and Related Issues:
Topic: Group Testing Designs: A Combinatorial Marvel	Some Personal Reflections
Dr. Tapan Kumar Chakrabarty, Professor, NEHU, Shillong Topic: Statistical Insights Through Resampling Methods	☐ Mr. Rakesh Asthana, Managing Director & CEO, World Informatix Cyber Security, Florida, USA
Prof. Bhaswati Ganguli, Professor, University of Calcutta	Topic: Exploring Cyber Security - How it impacts life
Topic: Machine Learning for Data Analysis	☐ Dr. Ashis Kumar Chakraborty, Professor, ISI, Kolkata
Mr. Sourabh Mukherjee, Associate Managing Director, Accenture	Topic: Evolution of Data Science: A Short Story
Topic: Data AI Cloud - Industry Perspective	☐ Dr. Partha Sarathi Paul, Associate Professor, IIT (ISM) Dhanbad  Topic: Multivariate Statistical Model

## Value Added Courses Offered

Department of Statistics	Department of Computer Science	
RELIABILITY AND SURVIVAL ANALYSIS	LATEX PROGRAMMING	



## Workshop and FDP



One-week Refresher Course on "Data Analytics and Machine Learning" from 21<sup>st</sup> August 2023 to 26<sup>th</sup> August 2023. Participants from various colleges/universities, industry personnel and Government officers had enrolled for the refresher course. The workshop was conducted in blended mode and was conducted as a part of MoU between SXUK and WEBEL.

St. Xavier's University Kolkata and WEBEL jointly organized a

One-week Refresher Course

Faculty of Science celebrated National Technology Day by organizing a 3-day workshop on "Data Analytics and Machine Learning" from 11th May 2023 to 13th May 2023. Students from various colleges/universities pursuing graduation or post-graduation in Computer Science and Statistics had enrolled for the workshop.



3-day workshop



# Students' Achievements

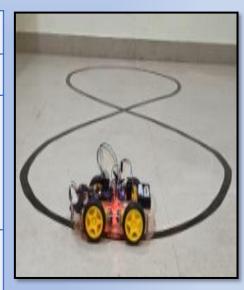
Research Publications					
Paper Name	Author				
ecurity Algorithms in Wearable and nplantable Medical Devices: A omprehensive Overview	Journal	St Xaviers University Kolkata Journal of Interdisciplinary Research	Accepted	<b>Koustav Bal,</b> Dr. Sayan Das, Dr. Tuhin Utsab Paul	
re-to-Post Quantum: A journey bridging ne eras	Journal	InderScience	Communicated	<b>Arnav Das,</b> Dr. Sayan Das	

Pre-to-Post Quantum: A journey bridging the eras	Journal	InderScience	Communicated	<b>Arnav Das</b> , Dr. Sayan Das
A Review of Cryptographic Techniques and Cyber-Physical Systems for E-Voting	Journal	IET Cyber-Physical Systems	Communicated	<b>Keshav Jhunjhunwala,</b> Dr. Sayan Das, Dr. Tuhin Utsab Paul
Deep Learning and Transfer Learning Approaches for Glaucoma Detection: A Comprehensive Review	Conference	QEDS 2024, BIT Mesra	Accepted	<b>Keshav Jhunjhunwala</b> , Dr. Tuhin Utsab Paul, Dr. Sayan Das
Intelligent Web-Scraping based question-asnwering Bot	Conference	Adcomsys, UEM Kolkata	Communicated	<b>Koustav Bal,</b> Dr. Tuhin Utsab Paul, Dr. Mrinmoyee Bhattacharya

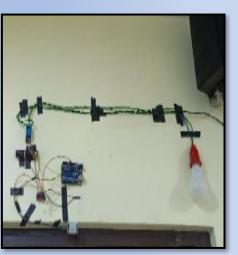


## Students' Achievements

Name	About	Student Name	Guide		
Glaucoma Detection using Deep Learning	This study explores the development of deep learning techniques for fundus image analysis in the diagnosis of glaucoma. Using transformer learning methods and convolutional neural networks (CNNs), the study aims to identify minute anatomical differences such optic nerve cupping and anomalies in the retinal nerve fibre layer.	Keshav Jhunjhunwala	Dr. Tuhin Utsab Paul		
Intelligent Web-Scraping based question-asnwering Bot	LLM-based model capable of scraping a website to solve question-answering tasks	Koustav Bal	Dr. Mrinmoyee Bhattacharya		
Self Repairing Code Synthesis with Code Flow Understanding	An LLM model for "natural language to code" generation with code repairing and code understanding through graphs.		Dr. Sayan Das		
Line Follower	A line follower project is a robotics project where a machine is designed to autonomously follow a black line marked on the ground. The machine typically uses Infrared (IR) sensors, to detect the contrast between the line and the surrounding surface.	Afsana Zeba Yasmin, Ashmita Bhattacharjee, Sara Dhar, Sumit Saha	Dr. Suvendu Chattaraj		
Automatic Room Light Control	Automatic light control is a project that utilizes the Arduino microcontroller and a Passive Infrared (PIR) Sensor to automatically control the lighting in a space based on the presence or absence of motion, where the lights in the room will automatically turn ON when human presence is detected and turn off when no one is present.	Afsana Zeba Yasmin, Ashmita Bhattacharjee, Sara Dhar, Sumit Saha, Aryan Gomes, Niladri Sarkar, Soumyadip Banik	Dr. Suvendu Chattaraj		



Line Follower



Automatic Room Light Control



# **Sports**

















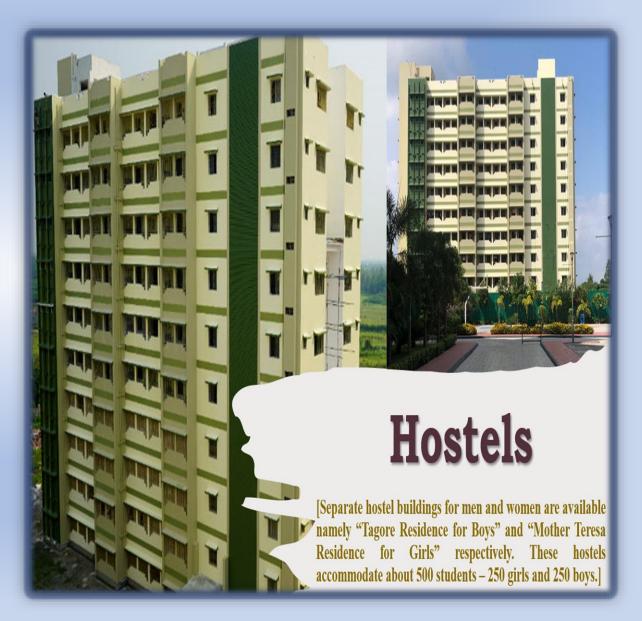






## Infrastructure & Facilities







## Students Speak



"My journey of Master's in Statistics at SXUK was made easier with the right guidance and the hard work of the teachers. This university has provided me with proper environment for better education from study libraries to computer labs to quality study sessions. My experience here has helped me acquire a wider perspective about the depth and possibilities of my domain. The steadfast commitment to empower students to face the future has been the objective of the Department." ~Bratasree Bhuiya, 2<sup>nd</sup> Year, M. Sc. Statistics

"In my experience all the teachers at the Department of Computer Science, St Xavier's University, Kolkata are very supportive and friendly. They helped me enhance my academic and interpersonal skills. SXUK gave me an opportunity to meet different kind of people and learn many things across various domains. I would recommend every student, who wishes to make a career in Computer Science, to join SXUK." ~Keshav [hunjhunwala, 2<sup>nd</sup> Year, M. Sc. Computer Science]





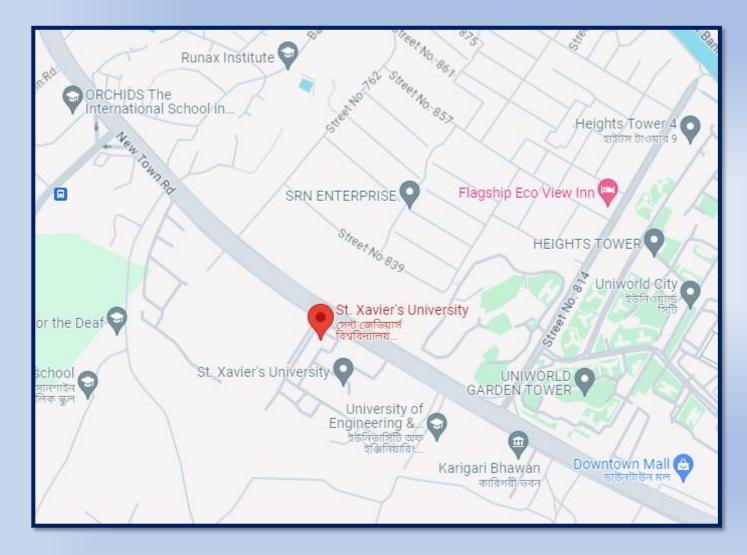
"The SXUK family provides us with an extremely positive and conductive environment to explore academics and various other activities alongside is what give us students a delightful experience for our self-development. My sincere appreciation to the faculty members of the Department of Statistics who are great and engaging with the students. I feel extremely blessed to have the opportunity to learn and grow under the Science Department which provides us with so many facilities like a wonderful organised library for our betterment. I believe to have a more careeristic approach towards life by the end of my course." ~Shreya Nandy, 1st Year, M. Sc. Statistics

"As a student at SXUK, I have found it to be an exceptional place for learning and growth. The dedicated faculty, state-of-the-art facilities, and inclusive atmosphere make it the perfect academic home. I must highlight the outstanding Department of Computer Science. The professors are not only highly knowledgeable but also deeply passionate about their subjects. Their guidance has been instrumental in my academic journey. The department's commitment to staying up-to-date with the latest technology trends and providing cutting-edge resources has been invaluable. The practical and hands-on approach is truly commendable. I am fortunate to be a part of this institution, which is preparing me for a successful future." ~Afsana Zeba Yasmin, 1st Year, M. Sc. Computer Science





### Contact Us





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