Sungshin Women's University

School of Mathematics, Statistics and Data Science

1. Introduction

School of Mathematics, Statistics and Data Science is an interdisciplinary program that encompasses mathematics and statistics as its foundation, addressing essential fields such as data science and fintech in the era of the Fourth Industrial Revolution. With a robust foundation in mathematics and statistics, the department aims to cultivate talents with strong adaptability to real-world scenarios in the field of mathematical sciences through various practical courses.

- Mathematics Major
The mathematics major offers different career tracks, including the pure mathematics track for research and education, the industrial and applied mathematics track that utilizes mathematics in industries and applications such as data and video analysis, and the startup track related to mathematics. These tracks aim to educate students to grow into professionals in various fields based on mathematics.

- Fintech Major
The fintech major focuses on cultivating specialized professionals optimized for future-oriented financial services. It operates tracks such as ICT-based financial cryptography, AI-based intelligent financial services, and insurance and finance qualifications (such as insurance management and certified public accountants (CPA)). Providing tailored education, the department aims to nurture experts who integrate advanced ICT technology and finance as smart finance professionals based on mathematical sciences.

- Statistics Major
The Statistics major aims to produce statistical analysis experts who can thrive in diverse fields such as national statistics, social surveys, financial data analysis, and bioinformatics. The educational program that incorporates several disciplines like fintech, data science, and AI convergence encourages our students to study statistical methodologies using various softwares such as R, Python, and SAS.

- Big Data Science Major
The Big Data Science major is committed to producing data science professionals who can create additional value by applying scientific analyses. Our educational program is not one-dimensional, but offers integrative courses related the Statistics, Fintech and AI Convergence majors.

2. Educational Objectives

The educational objectives of the Department of Mathematical Statistics and Data Science are to cultivate professionals specialized in fintech and data science, equipped with a foundation in mathematics and statistics along with expertise in ICT and financial knowledge.

3. Qualities of Graduates

- Experts who can actively respond to the digital innovation in the financial market driven by fintech and datatech, based on a foundation in mathematics and statistics.
- Professionals capable of utilizing and analyzing large-scale data to extract valuable information, and actively responding to or predicting changes based on the generated knowledge.
- Experts trained in practical programming skills.
- Professionals who apply mathematics and statistics to industries, creating new value.

Professors

Park Hee Won

Research Areas	Model Evaluation, Bioinformatics, Computational Network Biology
Subjects	Regression Analysis, Data Analysis for Business and Economics, Time Series Analysis
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Shin JoonHo

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Han Beom Seok

Research Areas	Partial Differential Equation and Its Applications,
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Kim Tak Won

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Choi Tae Hwa

Research Areas	Survival Analysis, Semiparametric Models, Dynamic Treatment Rules
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Shin Yong Su

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Professors

Kim Ju Hong

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Hwang Jung Yeon

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Shim Seong A

Research Areas	Applied Mathematics
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Kim Suh Ri

Research Areas	Applied Mathematics(Post-Quantum Cryptography /Elliptic Curve-Based Encryption/Financial Cryptography Implementation)
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Yun Ki Heon

Research Areas	Topology
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Lee Seong-Keon

Research Areas	Statistical Analysis for Big Data, Data Mining
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Professors

Park Man Sik

Research Areas	Spatial Statistics, Categorical Data Analysis
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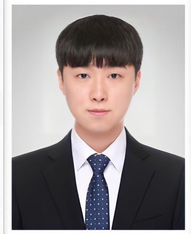

Jung Hohyun

Research Areas	Social Network Analysis, Statistical Modeling,
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Park Seongoh

Research Areas	Multivariate Data Analysis, Graphical Model, Missing Data Nalysis, Modeling Matrix-Variate Data
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Bak Kwan-Young

Research Areas	Nonparametric Inference, Function Estimation
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Kim Dong Ha

Research Areas	Deep learning, Machine Learning, Data Mining
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School of Mathematics, Data Science Major Curriculum

Major(Division)	Subject Name	Semester
Core Major(1)	Combinatorics and graph theory	1
Core Major(1)	Calculus	2
Core Major(1)	Statistical Thinking	1
Core Major(1)	Laboratory in Introductory Statistics	2
Core Major(1)	Introduction to Fintech	2
Core Major(1)	Introduction to Data Science	1
Core Major(1)	Matrix Algebra	2
Core Courses (Empirical and Mathematical Reasoning)	Introduction to Calculus and Vector Analysis (SA045900)	1
Core Courses (Empirical and Mathematical Reasoning)	Introductory Statistics (SA046100)	1
Core Courses (Empirical and Mathematical Reasoning)	Python Programming	1

* View All Courses: https://sugang.sungshin.ac.kr/ (Language : English)

Mathematics Major Curriculum

Major(Division)	Subject Name	Semester
Core Major(1)	Introduction to Calculus and Vector Analysis	1
Core Major(2)	Introduction to Analysis 1	1
Core Major(2)	Linear Algebra 1	1
Core Major(2)	Mathematical Modeling and Differential Equations	1
Core Major(2)	Number Theory	1
Core Major(2)	Multivariable Calculus	1
Core Major(2)	Mathematics for Machine Learning	1
Advanced Major(3)	Modern Algebra 1	1
Advanced Major(3)	Functions of Complex Variables	1
Advanced Major(3)	Theory of Mathematical Problem Solving	1
Advanced Major(3)	Theory and Research in Mathematics Education	1
Advanced Major(3)	Logic and Essay Writing in Mathematics	1
Advanced Major(3)	Financial Society with Mathematics	1
Advanced Major(3)	Topology 1	1
Advanced Major(3)	Advanced Mathematical Programming	1
Advanced Major(4)	Real Analysis	1
Advanced Major(4)	History of Mathematics	1
Advanced Major(4)	Topological Data Analysis	1
Advanced Major(4)	Numerical Data Processing	1
Core Major(2)	Introduction to Analysis 2	2
Core Major(2)	General Geometry	2
Core Major(2)	Linear Algebra 2	2
Core Major(2)	Mathematical Programming	2
Core Major(2)	Introduction to Probability and Statistics	2
Advanced Major(3)	Differential Geometry	2
Advanced Major(3)	Modern Algebra 2	2
Advanced Major(3)	Integrations of Complex Variables	2
Advanced Major(3)	Teaching Materials and Instructional Methods for Mathematics Education	2
Advanced Major(3)	Topology 2	2
Advanced Major(3)	Numerical Analysis with Python	2
Advanced Major(4)	Partial Differential Equation and its Applications	2

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Statistics Major Curriculum

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1 Semester

Major(Division)	Subject Name
Core Major(2)	Statistical Package Programming
Core Major(2)	Actuarial Statistics
Core Major(2)	Mathematical Statistics 1
Core Major(2)	Exploratory Data Analysis
Core Major(2)	Statistics with R
Advanced Major(3)	The practice of Social Research
Advanced Major(3)	Laboratory in Regression Analysis
Advanced Major(3)	Categorical Data Analysis
Advanced Major(3)	Experimental Design
Advanced Major(3)	Statistical Computing and Simulation
Advanced Major(4)	Multivariate Data Analysis I
Advanced Major(4)	Data Analysis for Business and Economics
Advanced Major(4)	Statistical Analysis for Big data
Advanced Major(4)	Recent Statistical Models

2 Semester

Major(Division)	Subject Name
Core Major(1)	Statistics with Excel
Core Major(2)	Laboratory in Statistical Programming
Core Major(2)	Mathematical Statistics 2
Core Major(2)	Regression Analysis
Core Major(2)	Statistics with Python
Core Major(2)	Introduction to Database
Advanced Major(3)	Biostatistics
Advanced Major(3)	Time Series Data Analysis
Advanced Major(3)	Statistics and Marketing
Advanced Major(3)	Statistics with SQL
Advanced Major(3)	Statistical Analysis for Artificial Intelligence
Advanced Major(4)	Multivariate Data Analysis II
Advanced Major(4)	Data Mining
Advanced Major(4)	Financial Data Analysis
Advanced Major(4)	Advanced Statistical Analysis

Fintech Major Curriculum

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1 Semester

Major(Division)	Subject Name
Advanced Major(3)	Financial Database
Advanced Major(3)	AI Fintech Service
Advanced Major(3)	Fintech with Applied Cryptography 1
Advanced Major(3)	Financial Cryptography Implementation 1
Advanced Major(3)	Actuarial Science
Advanced Major(4)	Smart Payment Authentication
Advanced Major(4)	Introduction to Cryptographic Protocols
Advanced Major(4)	Fintech Capstone Design 1

2 Semester

Major(Division)	Subject Name
Core Major(2)	Basic Actuarial Science
Core Major(2)	Mathematical Cryptology 2
Advanced Major(3)	Fintech with Applied Cryptography 2
Advanced Major(3)	Financial Cryptography Implementation 2
Advanced Major(4)	Smart Financial Data Analysis
Advanced Major(4)	Fintech Capstone Design 2

Big Data Science Major Curriculum

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Major(Division)	Subject Name	Semester
Advanced Major(3)	Data-driven Artificial Intelligence 1	1
Advanced Major(3)	Numerical Optimization and Statistical Computing	1
Advanced Major(4)	Text Mining	1
Advanced Major(4)	Advanced Machine Learning	1
Advanced Major(4)	Big Data Capstone Design 1	1
Core Major(1)	Data Science Practice	2
Advanced Major(3)	Data-driven Artificial Intelligence 2	2
Advanced Major(3)	Social Network Analysis	2
Advanced Major(4)	Business Analytics	2
Advanced Major(4)	Big Data Capstone Design 2	2

Sungshin Women's University

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