Master of Statistics

Apply now for entry in September 2020

- Big data analytics
- Data mining
- Social Network
- Spatial data analysis
- Risk management & Basel accords
- Algorithmic trading
- Marketing analytics

Advanced Knowledge

Practical Skills

Professional Views
The degree of Master of Statistics is a one-year full-time / two-year part-time programme, which has been restructured from the previous degree of Master of Social Sciences in Applied Statistics that was launched in September 1987. Since the first graduation in 1989, we expect to have about 1,000 graduates when the present cohort completes the programme.

This programme is designed to provide a rigorous training in the principles and the practice of statistics. It emphasizes in applications and aims to prepare candidates for further study, research, consulting work and administration in various fields through computer-aided and hands-on experience.

Programme Highlights
- Ranked No.34 worldwide overall*
- Based on the Quacquarelli Symonds (QS) World University Ranking by Subject 2019
- A knowledge able statistician in principles and practice
- Experience hands-on applications of methodologies with powerful statistical software
- Could select up to seven electives from the Department’s research postgraduate courses
- Join the programme of more than 30 years in curriculum development and delivery
- Select a theme of your interest (Risk Management theme / Data Analytics theme)
- Ranked No.34 worldwide overall*

Programme Learning Outcomes
- To critically evaluate and to make proper use of models and techniques for data analyses and risk management, and to encounter in the data explosion era analytic jobs which require advanced computational skills
- To equip with hands-on experience in statistical and risk analyses using commercial statistical software and be competent for data-analytic jobs which require advanced computational skills
- To make informed decisions on complex real-life problems encountered in the data explosion era
- To communicate effectively with the layman on statistical issues
- To equip with hands-on experience in statistical and risk analyses using commercial statistical software and be competent for data-analytic jobs which require advanced computational skills
- To make informed decisions on complex real-life problems encountered in the data explosion era

Master of Statistics Outstanding Performance Scholarship
One scholarship of HK$50,000 shall be awarded annually to an MStat student on the basis of academic merit and quality of coursework.

Lifelong Learning Prizes in Statistics
There are Lifelong Learning Prizes in Statistics, each from $5,000 to $10,000, awarded to students on the basis of academic achievement.

Reimbursable Course(s) by Continuing Education Fund (CEF)*
Six courses in the programme:
- STAT7006 Design and analysis of sample surveys
- STAT8007 Statistical methods in economics and finance
- STAT8015 Risk management and Basel Accords
- STAT8016 Actuarial statistics
- STAT8017 Data mining techniques
- STAT8019 Marketing Analytics

Six courses in the programme:
- STAT7006 Design and analysis of sample surveys
- STAT8007 Statistical methods in economics and finance
- STAT8015 Risk management and Basel Accords
- STAT8016 Actuarial statistics
- STAT8017 Data mining techniques
- STAT8019 Marketing Analytics

* The mother programme (Master of Statistics) of these courses is recognised under the Qualifications Framework (QF) Level 6.

Programme Curriculum
Comming in September, the curriculum is composed of a total of 60 credits of courses in either one year for full-time study, or two years for part-time study. The programme offers great flexibility for students who wish to take a general approach or a specialised theme in Risk Management or Data Analytics. A student may choose to have his/her theme printed on the transcript if he/she has satisfied the requirement of one of the themes. If a student selects an MStat course whose contents are similar to a course (or courses) which he/she has taken in his/her previous study, the Department may not approve the selection in question. Students must obtain a cumulative GPA of at least 2.0 to graduate.

Curriculum study applicable for both full-time and part-time modes

Two compulsory courses (12 credits)
STAT7101 Fundamentals of statistical inference (6 credits)
STAT7102 Advanced statistical modelling (6 credits)

Students with prior background has to take a more advanced course from the same area as replacement:
REPLACE... WITH...
STAT7101 Fundamentals of statistical inference (6 credits) with STAT6002 Research methods in statistics (6 credits)
or
STAT7102 Advanced statistical modelling (6 credits) with STAT7005 Multivariate methods (6 credits)
Any other course

Risk Management theme
Risk Management theme plus 24 credits from
- STAT6015 Financial data analysis (6 credits)
- STAT6016 Advanced quantitative risk management and finance (6 credits)
- STAT6017 Operational risk and insurance analytics (6 credits)
- STAT8005 Time series forecasting (6 credits)
- STAT8007 Statistical methods in economics and finance (6 credits)
- STAT8014 Risk management and Basel Accords (6 credits)
- STAT8015 Actuarial statistics (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8020 Quantitative strategies and algorithmic trading (6 credits)
- STAT8021 Big data analytics (6 credits)
- STAT8016 Biostatistics (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8018 Programming for data science (6 credits)
- STAT8019 Marketing analytics (6 credits)
- STAT8021 Big data analytics (6 credits)
- STAT8022 Structural equation modelling (6 credits)
- STAT8023 Bayesian statistics (6 credits)
- STAT8024 Statistical methods for network data (6 credits)
- STAT6009 Research methods in statistics (6 credits)
- STAT6010 Advanced probability (6 credits)
- STAT7006 Design and analysis of sample surveys (6 credits)
- STAT7002 Socio-economic statistics for business and public policies (6 credits)
- STAT8000 Workshop on spreadsheet modelling and database management (6 credits)
- STAT8001 Career development and communication workshop (Non-credit-bearing)
- STAT8004 Current topics in statistics (6 credits)
- Any capstone course

Data Analytics theme
Data Analytics theme plus 24 credits from
- STAT6011 Computational statistics (6 credits)
- STAT6012 Spatial data analysis (6 credits)
- STAT7002 Multivariate methods (6 credits)
- STAT7007 Categorical data analysis (6 credits)
- STAT7008 Programming for data science (6 credits)
- STAT8003 Time series forecasting (6 credits)
- STAT8016 Biostatistics (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8018 Programming for data science (6 credits)
- STAT8019 Marketing analytics (6 credits)
- STAT8021 Big data analytics (6 credits)
- STAT8022 Structural equation modelling (6 credits)
- STAT8023 Bayesian statistics (6 credits)
- STAT8024 Statistical methods for network data (6 credits)
- STAT6009 Research methods in statistics (6 credits)
- STAT6010 Advanced probability (6 credits)
- STAT7006 Design and analysis of sample surveys (6 credits)
- STAT7002 Socio-economic statistics for business and public policies (6 credits)
- STAT8000 Workshop on spreadsheet modelling and database management (6 credits)
- STAT8001 Career development and communication workshop (Non-credit-bearing)
- STAT8004 Current topics in statistics (6 credits)
- Any capstone course

Other elective courses (18 credits)
plus at least 18 credits from
- STAT6009 Research methods in statistics (6 credits)
- STAT6010 Advanced probability (6 credits)
- STAT7006 Design and analysis of sample surveys (6 credits)
- STAT7004 Socio-economic statistics for business and public policies (6 credits)
- STAT8000 Workshop on spreadsheet modelling and database management (6 credits)
- STAT8001 Career development and communication workshop (Non-credit-bearing)
- STAT8004 Current topics in statistics (6 credits)
- Any other course

Capstone requirement (6 credits)
plus 6 credits from
- STAT8002 Project (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8038 Practicum (6 credits)
- STAT8039 Capstone project (6 credits)

Apart from the two compulsory courses and capstone requirement, candidates may choose not to follow any theme and may take 42 credits of elective courses in any order, whenever feasible.

“Working with numbers is in great demand in the years to come, evidenced in the impressive growth outlook numbers that help bolster the rankings of jobs like Data Scientist and Statistician.”


“Integration of statistical inference principles as part of Big Data will be essential to resolve these (big data) challenges.”

Extracted from the Federal Big Data Research and Development Strategic Plan by the Executive Office of the President of the USA.
The degree of Master of Statistics is a one-year full-time / two-year part-time programme, which has been restructured from the previous degree of Master of Social Sciences in Applied Statistics that was launched in September 1987. Since the first graduation in 1989, we expect to have about 1,000 graduates when the present cohort completes the programme.

This programme is designed to provide a rigorous training in the principles and the practice of statistics. It emphasizes in applications and aims to prepare candidates for further study, research, consulting work and administration in various fields through computer-aided and hands-on experience.

Programme Highlights
- Ranked No 34 worldwide overall
- A knowledge base and practical skills
- Experience hands-on applications of methodologies with powerful software
- Could select up to seven electives from the Department's research postgraduate courses
- Join the programme of more than 30 years in curriculum development and delivery
- Select a theme of your interest (Risk Management theme / Data Analytics theme)

Master of Statistics Outstanding Performance Scholarship
One scholarship of HK$$50,000 shall be awarded annually to an MStat student on the basis of academic merit and quality of coursework.

Lifelong Learning Prizes in Statistics
There are Lifelong Learning Prizes in Statistics, each from $5,000 to $10,000, awarded to students on the basis of academic achievement.

Reimbursable Course(s) by Continuing Education Fund (CEF)*
Six courses in the programme:
- STAT7006 Design and analysis of sample surveys
- STAT8007 Statistical methods in economics and finance
- STAT8014 Risk management and Basel Accords
- STAT8015 Actuarial statistics
- STAT8017 Data mining techniques
- STAT8019 Marketing Analytics

* The programme (Master of Statistics) of these courses is recognised under the Qualifications Framework (QF) Level 6.

Programme Curriculum
Comprising in September, the curriculum is composed of a total of 60 credits of courses in either one year for full-time study, or two years for part-time study. The programme offers great flexibility for students who wish to take a general approach or a specialised theme in Risk Management or Data Analytics. A student may choose to have his/her theme printed on the transcript if he/she has satisfied the requirement of one of the themes. If a student selects an MStat course whose contents are similar to a course (or courses) which he/she has taken in his/her previous study, the Department may not approve the selection in question. Students must obtain a cumulative GPA of at least 2.0 to graduate.

Curriculum study (applicable for both full-time and part-time modes)

Two compulsory courses (12 credits)
- STAT7101 Fundamentals of statistical inference (6 credits)
- STAT7102 Advanced statistical modelling (6 credits)

Students with prior background has to take a more advanced course from the same area as replacement:
- REPLACE... with STAT6009 Research methods in statistics (6 credits)
- or STAT7005 Multivariate methods (6 credits)
- Any other course

Risk Management theme
- STAT6015 Financial data analysis (6 credits)
- STAT6017 Advanced quantitative risk management and finance (6 credits)
- STAT60189 Risk management and Basel Accords (6 credits)
- STAT8005 Time series forecasting (6 credits)
- STAT8007 Statistical methods in economics and finance (6 credits)
- STAT8014 Risk management and Basel Accords (6 credits)
- STAT8015 Actuarial statistics (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8020 Quantitative strategies and algorithmic trading (6 credits)
- STAT8021 Big data analytics (6 credits)

Data Analytics theme
- STAT6011 Computational statistics (6 credits)
- STAT6016 Spatial data analysis (6 credits)
- STAT7005 Multivariate methods (6 credits)
- STAT7007 Categorical data analysis (6 credits)
- STAT7008 Programming for data science (6 credits)
- STAT8003 Time series forecasting (6 credits)
- STAT8016 Biostatistics (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8019 Marketing analytics (6 credits)
- STAT8021 Big data analytics (6 credits)
- STAT8022 Structural equation modelling (6 credits)
- STAT8035 Bayesian statistics (6 credits)
- STAT8036 Statistical methods for network data (6 credits)

Other elective courses (18 credits)
- STAT6009 Research methods in statistics (6 credits)
- STAT6010 Advanced probability (6 credits)
- STAT7006 Design and analysis of sample surveys (6 credits)
- STAT7011 Socio-economic statistics for business and public policies (9 credits)
- STAT8000 Workshop on spreadsheet modelling and database management (5 credits)
- STAT8001 Career development and communication workshop (Non-credit-bearing)
- STAT8004 Current topics in statistics (5 credits)
- Any them-specific elective courses
- Any capstone courses

Capstone requirement (6 credits)
- STAT8002 Project (6 credits)
- STAT8017 Data mining techniques (6 credits)
- STAT8009 Practicum (6 credits)
- STAT8009 Capstone project (6 credits)

Apart from the two compulsory courses and capstone requirement, candidates may choose not to follow any theme and may take 42 credits of elective courses in any order, whenever feasible.
STAT8005 Research methods in statistics (6 credits)
This course introduces some statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on understanding the role of state of the art statistical techniques and their underlying theory. Contents may be selected from: (1) Basic asymptotic methods; models of classical statistical inference, central limit theorems, delta method; (2) Parametric and nonparametric likelihood methods; high order approximations, profile likelihood and its variants; (3) Nonparametric statistical inference: sign and rank tests, Kolmogorov-Smirnov test, nonparametric regression estimation, kernel density estimation; (4) Estimation of operational risk and Basel regulation, loss distribution, estimation of risk variables and two stage least squares; panel time series model; unit root tests, regression with heteroscedastic and/or autocorrelated errors; instrumental estimating equations. 

Assessment: 1-hour written examination; coursework component.

STAT8013 Advanced computation in statistics (6 credits)
This course aims to give postgraduate students in statistics a background in modern computationally intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods. Contents include: numerical linear algebra; the Expectation-Maximization algorithm, methods of data sampling, Monte Carlo methods, randomization tests, simulation of complex sampling schemes, bootstrapping

Assessment: 2-hour written examination; coursework component.

STAT8014 Risk management and Basel Accords (6 credits)

STAT8015 Actuarial statistics (6 credits)

STAT8016 Biostatistics (6 credits)

STAT8017 Data mining techniques (6 credits)

STAT8020 Quantitative strategies and algorithmic trading (6 credits)

Quantitative trading is a systematic investment approach that consists of identification of trading opportunities via statistical data analysis and implementation through computer algorithms. This course introduces various methodologies that are commonly employed in quantitative trading. The course focuses on the industry be fully aware of the relevant risk management, including the nature of high frequency trading and its regulation, the evolution of market microstructure, algorithmic trading and strategies and the relatively new field of operational risk and Basel Accords. This course also provides an overview of the variety of sources (e.g. Excel, web-scraping, APIs and others), object-oriented programming, and various computational tools such as R and Python libraries. Students will learn to create their own R packages or Python libraries.

Assessment: 1-hour written examination; coursework component.

STAT8030 Operational risk and insurance analytics (6 credits)

This course aims to introduce students to the fundamental concepts and methods involved in modelling data which are correlated in space. Applications can be found in many fields including epidemiology and public health, environmental sciences and ecology, and others. Covered topics include: (i) Outline of three types of statistical data: point-count, point-pattern, spatial point process; (ii) Model-based geostatistics: covariance functions and the variogram, spatial trend models and random fields; (iii) Exploratory spatial data analysis: visualisation of large data sets, fitting of statistical models to data; (iv) Spatial prediction: kriging and simulation, maximum likelihood; spatial prediction by least squares, by simple and ordinary kriging using the linear model of coregionalisation and the multigaussian model, in random fields; (v) Spatial regression with heterogeneous variance; (vi) Hierarchical modelling for univariate spatial response data, including spatial correlation and spatial scale. Spatial data analysis and spatial prediction examples will be presented.

Assessment: 2-hour written examination; coursework component.

STAT8031 Financial data analysis (6 credits)

This course provides an introduction to the analysis of financial data. Special emphasis will be put on the analytical and modeling techniques for financial and operational risk. Contents include fundamental concepts of statistical inference, financial models and their use for risk management, financial time series models. Random variables, random processes, random vectors, random functions, convergence of random variables, Hilbert spaces, conditional expectation, martingales.

Assessment: 2-hour written examination; coursework component.

STAT8040 Bayesian statistics or equivalent

Assessment: 2-hour written examination; coursework component.

STAT8042 Introduction to risk management (6 credits)

This course introduces the basic concepts and principles of statistical inference and decision-making. Contents include: probability, independence, Bayes’ theorem, maximum likelihood, likelihood estimation, hypothesis testing, likelihood ratio test, chi-square test, analysis of variance, statistical decision theory, estimation and hypothesis testing using empirical and computer methods. Only under exceptional academic circumstances can this compulsory course be replaced by an elective course.

Assessment: 2-hour written examination; coursework component.

STAT8043 Design and analysis of sample surveys (6 credits)

This course covers classical concepts and techniques involved in survey sampling, which are relevant to conducting and analyzing surveys, as well as to generalizing results from samples to populations. Topics include: sampled design, sampling error, random sampling, stratified sampling, cluster sampling, systematic sampling, sample survey analysis, and nonresponse bias. 

Assessment: 1-hour written examination; coursework component.

STAT8045 Risk management and Basel Accords (6 credits)

Being an important and comprehensive course, Hong Kong has always been on the alert for risk in the banking and financial system. We have weathered many attacks and challenges, while maintaining the deep and broad financial crisis in 2007, 2008, and has been the primary focus of most people. The Basel Accords are intended to provide a level playing field to the industry to be fully aware of the relevant risk management, including the nature of high frequency trading and its regulation, the evolution of market microstructure, algorithmic trading and strategies and the relatively new field of operational risk and Basel Accords. This course also provides an overview of the variety of sources (e.g. Excel, web-scraping, APIs and others), object-oriented programming, and various computational tools such as R and Python libraries. Students will learn to create their own R packages or Python libraries.

Assessment: 1-hour written examination; coursework component.

STAT8050 Risk management and Basel Accords (6 credits)

This course introduces some statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on understanding the role of state of the art statistical techniques and their underlying theory. Contents may be selected from: (1) Basic asymptotic methods; models of classical statistical inference, central limit theorems, delta method; (2) Parametric and nonparametric likelihood methods; high order approximations, profile likelihood and its variants; (3) Nonparametric statistical inference: sign and rank tests, Kolmogorov-Smirnov test, nonparametric regression estimation, kernel density estimation; (4) Estimation of operational risk and Basel regulation, loss distribution, estimation of risk variables and two stage least squares; panel time series model; unit root tests, regression with heteroscedastic and/or autocorrelated errors; instrumental estimating equations.

Assessment: 1-hour written examination; coursework component.

STAT8052 Statistical models in economics and finance (6 credits)
This course aims to introduce various statistical models and methodology used in financial applications and provide students with the tools necessary to analyze and interpret financial data. The types of statistical problems encountered will be motivated by experimental data sets. Important topics include design and analysis of randomized clinical trials, group sequential designs and crossover trials, survival studies, disease risk, statistical analysis of the medical process.

Assessment: 1-hour written examination; coursework component.

STAT8053 Introduction to risk management (6 credits)

This course introduces the basic concepts and principles of statistical inference and decision-making. Contents include: probability, independence, Bayes’ theorem, maximum likelihood, likelihood estimation, hypothesis testing, likelihood ratio test, chi-square test, analysis of variance, statistical decision theory, estimation and hypothesis testing using empirical and computer methods. Only under exceptional academic circumstances can this compulsory course be replaced by an elective course.

Assessment: 2-hour written examination; coursework component.

STAT8054 Risk management and Basel Accords (6 credits)

This course introduces some statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on understanding the role of state of the art statistical techniques and their underlying theory. Contents may be selected from: (1) Basic asymptotic methods; models of classical statistical inference, central limit theorems, delta method; (2) Parametric and nonparametric likelihood methods; high order approximations, profile likelihood and its variants; (3) Nonparametric statistical inference: sign and rank tests, Kolmogorov-Smirnov test, nonparametric regression estimation, kernel density estimation; (4) Estimation of operational risk and Basel regulation, loss distribution, estimation of risk variables and two stage least squares; panel time series model; unit root tests, regression with heteroscedastic and/or autocorrelated errors; instrumental estimating equations.

Assessment: 1-hour written examination; coursework component.

STAT8055 Quantitative strategies and algorithmic trading (6 credits)

Quantitative strategies and algorithmic trading: A systematic investment approach that consists of identification of trading opportunities via statistical data analysis and implementation through computer algorithms. This course introduces various methodologies that are commonly employed in quantitative trading. The course focuses on the industry be fully aware of the relevant risk management, including the nature of high frequency trading and its regulation, the evolution of market microstructure, algorithmic trading and strategies and the relatively new field of operational risk and Basel Accords. This course also provides an overview of the variety of sources (e.g. Excel, web-scraping, APIs and others), object-oriented programming, and various computational tools such as R and Python libraries. Students will learn to create their own R packages or Python libraries.

Assessment: 1-hour written examination; coursework component.
STAT7120 Advanced statistical modelling (6 credits)
This course introduces modern methods for constructing and evaluating statistical models applied to computer-intensive computing and numerical software, such as R or Python. It will cover both the underlying principles of modern statistical methods and model-fitting techniques, and the use of computer software for estimating models. Topics include: (i) linear regression models; (ii) Generalized linear models; (iii) Mixed models; (iv) Kernel and local polynomial regression; selection of smoothing parameters; and (v) Binary Markov models and Bayesian networks.
Assessment: One 2-hour written examination; 50% coursework and 50% examination

Elective Courses

STAT8009 Research methods in statistics (6 credits)
This course introduces some standard concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. It also aims to enhance students’ understanding of the role of statistical techniques and their underlying theory. Contents may be selected from: (i) Basic asymptotic methods: modes of convergence; Slutsky’s theorem; central limit theorems; delta method; (ii) Parametric and nonparametric likelihood methods: high order approximations, profile likelihood and its variants; (iii) Nonparametric statistical inference: sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression; optimal and near optimal nonparametric estimation and adaptive methods; (iv) Generalized linear and nonparametric regression models; cross-validation, bootstrap, permutation methods; (v) Robust methods: measurement of influence; R estimation; R estimation functions; (vi) Other topics as determined by the instructor.
Assessment: One 2-hour written examination; 25% coursework and 75% examination

STAT8100 Advanced probability (6 credits)
This course provides an introduction to theoretical probability. The course will focus on some basic concepts in theoretical probability which are important for students to develop in actuarial science, probability and statistics. Contents include: sigma-algebra, measurable space, measure and probability, measurable functions and measurable spaces, measurable functions, random variables, integration and expectations, characteristic functions, convergence of random variables, Hilbert spaces, conditional expectations, martingales.
Assessment: One 2-hour written examination; 25% coursework and 75% examination

STAT8101 Computational statistics (6 credits)
This course aims to give postgraduate students in statistics a background in modern computationally intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods. Contents include Monte Carlo Markov chain methods including Gibbs sampler, the Metropolis-Hastings algorithm and data augmentation, Generalized random variable methodology and Markov chain Monte Carlo methods including Gibbs sampler, the Metropolis-Hastings algorithm and data augmentation, Generalized random variable methodology and Markov chain Monte Carlo methods including Gibbs sampler, the Metropolis-Hastings algorithm and data augmentation.
Assessment: One 2-hour written examination; 25% coursework and 75% examination

STAT8008 Programming for data science (6 credits)
This course introduces fundamental programming languages for data science in an engaging and hands-on manner. This course provides students with an introduction to programming for data science in R, Python, MySQL, SQL and big data. Students will learn how to work with the Web, data visualization and interactive graphics, statistics and statistical computing, and big data for social sciences and humanities. This course provides students with an introduction to data science, including data visualization, data analysis, and big data.
Assessment: One 2-hour written examination; 40% coursework and 60% examination

STAT8006 Design and analysis of sample surveys (6 credits)
A time series consists of a set of observations on a random variable taken over time. Such series arise naturally in climatology, economics, finance, environment and many other fields. tourists to the industry be fully aware of the relevant risk management, including the use of financial models, market microstructure, (8) stylized features and models of high frequency data. Students are required to learn how to use the data to make better inference.
Assessment: One 1.5-hour written examination; 40% coursework and 60% examination

STAT8020 Quantitative strategies and algorithmic trading (6 credits)
Quantitative strategies and algorithmic trading is a systematic investment approach that consists of identification of trading opportunities via statistical data analysis and implementation of these strategies using computer algorithms. This course introduces various methodologies which are commonly employed in quantitative trading.
Assessment: One 2-hour written examination; 40% coursework and 50% examination

STAT8014 Risk management and Basel Accords (6 credits)
Being an important component of the financial system, Hong Kong has always been on the alert for the risk in the banking and financial industry. We have witnessed many attacks and threats, especially in the finance crisis started in 2007/08, this risk has been the primary focus of most people. This course will teach students how to use data analytics to manage their risk and to the industry be fully aware of the relevant risk management, including the use of financial models, market microstructure, (8) stylized features and models of high frequency data. Students are required to learn how to use the data to make better inference.
Assessment: One 2-hour written examination; 50% coursework and 50% examination

STAT8015 Actuarial statistics (6 credits)
Course Code: CEF 2120265-5I
The main focus of this module will be on financial mathematics of compound interest with an introduction to life contingencies and statistical theory of risks. Topics covered include: (1) compound interest; (2) yield curve; (3) term structure; (4) valuation of bonds and swaps; (5) life contingencies; (6) life distributions and mortality models; and (7) risk management. Students will learn how to use data to make better inference.
Assessment: One 3-hour written examination; 50% coursework and 50% examination

STAT8013 Financial data analysis (6 credits)
This course introduces various statistical models and methodology used in financial data analysis. The course is intended to be use as a second half of a semester course on financial mathematics, and will cover topics such as: (1) Basics of financial mathematics; (2) Financial time series and market microstructure; (3) Financial regression; (4) Computationally-intensive methods for operational risk and insurance. Contents include fundamentals of financial mathematics, the prediction of future behaviour of these variables, and the design and implementation of forecasting models.
Assessment: One 2-hour written examination; 25% coursework and 75% examination

STAT7104 Risk management and Basel Accords (6 credits)
Course Code: CEF 2120265-4
Being an important component of the financial system, Hong Kong has always been on the alert for the risk in the banking and financial industry. We have witnessed many attacks and threats, especially in the finance crisis started in 2007/08, this risk has been the primary focus of most people. This course will teach students how to use data analytics to manage their risk and to the industry be fully aware of the relevant risk management, including the use of financial models, market microstructure, (8) stylized features and models of high frequency data. Students are required to learn how to use the data to make better inference.
Assessment: One 2-hour written examination; 50% coursework and 50% examination

STAT7103 Financial data analysis (6 credits)
This course aims to provide the foundation of operational risk management and insurance. Special emphasis will be put on the analytical and modeling techniques for operational risk and insurance. Contents include fundamentals of insurance and operational risk management, the prediction of future behaviour of these variables, and the design and implementation of forecasting models.
Assessment: One 2-hour written examination; 25% coursework and 75% examination
The recent explosion of social media and the computerization of every aspect of life has fueled the increasing importance of data science. This course is designed for students who are eager to gain exposure to the field of data science. It provides a comprehensive overview of the discipline, covering topics such as data mining techniques, machine learning, natural language processing, sentiment analysis, and topic modeling. Students are required to possess basic knowledge of Python language.

Pre-requisites: Pass in STAT8070 Data mining techniques or equivalent Assessment: 100% coursework

STAT8089 Capstone project (6 credits)

This course is open to students of Master of Statistics Programme only. It provides students with hands-on experience in the applications of academic knowledge in real-life work environments. To be eligible, students should be undertaking a statistics-related or risk-management-related practicum with no less than 160 hours at least 30 working days spent in a past or unpaid position. It is possible for part-time students to complete their practicum within their current place of employment. The practicum will normally take place in the second semester or the summer semester for full-time students or during the second year for part-time students.

Assessment: Upon completion of the practicum, each student is required to submit a written report and to give an oral presentation on his/her practicum experience. Supervisors will assess the students based on their performance during the practicum period. Assessment of this course is on a Pass or Fail or Distinction basis with 3 criteria: (1) supervisor’s evaluation; (2) written report; (3) oral presentation. Please note that fail in fulfilling any of the 3 criteria satisfactorily would lead to a “Fail” grade in the course.

Pre-requisites: Passing STAT8088 Practicum (6 credits) or equivalent Assessment: 100% coursework

Summer Elective Courses:

STAT8031 Structural equation modelling (3 credits)

The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics of Structural Equation Modeling. These topics will build on the theory and methods covered in the compulsory courses. The topics include essential tools and strategies that are not normally taught in management and advanced internship study, and enhance students’ overall competitiveness in the employment market.

Assessment: 100% coursework; assessment of this course is on a pass or fail or distinction basis

STAT8034 Current topics in Statistics (3 credits)

The master of statistics of the University of Hong Kong is well designed for students to join industries with advanced analytical requirement. Most of the courses are suitable for both professionals to polish their quantitative skills and graduates to pursue further study. It offers me great exposure in statistical analysis, mathematical statistics, data science, and big data analytics, which are essential skills valued by international companies. It is also a challenging and up-to-date program, the state-of-the-art of statistical learning. Throughout the program, I was given a lot of support from the department, both academically and financially, to pursue my next career goal.

Wei Conghui [MStat Part-time Graduate 2019]

Assistant Manager, OCBC Wing Hang Bank

I thoroughly enjoyed my time as a MStat student. During my time here, apart from theory I was able to develop many skills which have proven to be vital to me for my career going forward. These include skills such as problem solving skills, advanced data analytics techniques, and also soft skills like job hunting skills. Currently I am working as a data analyst at 1% where I use the tools and skills I have developed during my MStat course to improve our business strategy to client. Working as a data analyst is exciting, each day brings new challenges.

Wu Qiyun [MStat Full-time Graduate 2019]

Senior Accountant, Data Analytics, Ernst & Young

The master of statistics of the University of Hong Kong enables students to acquire both a solid understanding of statistical theory and extensive knowledge about state-of-the-art applications. Thanks to the variety of courses, I could learn a lot about different applications of statistics and data analytics in different fields. Moreover, the programme provides me with the opportunity to meet with people from different backgrounds and we shared experience with each other. I am an actuary and there is an increasing focus on predictive analytics in my current field. A lot of the courses gave me an opportunity to meet and work with people from a wide range of professions. These all have definitely sharpened our techniques to cope with hands-on problems – an essential lifelong learning skill. Highly recommend this Programme to prospective students who are eager to gain exposure to the field of data science.

HD Chun To [IMStat Part-time Graduate 2019]

Quantitative Strategist, Asia Quantitative Equity Research, Morgan Stanley

The programme extends over not less than one academic year for full-time study and not less than two academic years for part-time study. Teaching will take place inMonday to Thursday from 9:30 a.m. – 12:30 p.m. and afternoons (2:00 – 5:00 p.m.) for full-time study and Monday to Friday from 9:30 a.m. – 12:30 p.m. and afternoons (2:00 – 5:00 p.m.) for part-time study. Teaching will take place in

Programme Duration and Class Schedules

The programme offers over not less than one academic year for the full-time study, and not less than two academic years for the part-time study. Teaching will take place on the following dates from Monday to Saturday for courses having course codes STATXXXX, and on weekday evenings (7:00 – 10:00 p.m.) and Saturday mornings (9:30 a.m. – 12:30 p.m.) for courses having course codes STATXXXXX or STATXXXXX. All lectures are conducted in English at HKU.

Optional Summer Courses

- **Preparatory summer courses in matrices and calculus, and introductory statistics, for part-time students who need to revitalize their skills during August:**
  - **Introductory course to the use of the language R for data analysis and graphics.**
  - **Tutorials in SAS for all the students who need to revitalize their skills in data management using SAS (August, 2020).**

Examples of backgrounds of admitted students in recent years:

- **funding administration and operation**
  - **Senior Consultant, Technical Service Delivery Management**
  - **Equity Manager**
  - **Software Engineer**
  - **Solution Consultant**
  - **Product Manager**
  - **Digital Marketer**
  - **Digital Marketer**
  - **Senior Consultant, Technical Service Delivery Management**
  - **Senior Consultant, Technical Service Delivery Management**
  - **Senior Consultant, Technical Service Delivery Management**

**Examples of students who are eager to gain exposure to the field of data science.**

The master of statistics of the University of Hong Kong is well designed for students to join industries with advanced analytical requirement. Most of the courses are suitable for both professionals to polish their quantitative skills and graduates to pursue further study. It offers me great exposure in statistical analysis, mathematical statistics, data science, and big data analytics, which are essential skills valued by international companies. It is also a challenging and up-to-date program, the state-of-the-art of statistical learning. Throughout the program, I was given a lot of support from the department, both academically and financially, to pursue my next career goal.

Wei Conghui [MStat Part-time Graduate 2019]

Assistant Manager, OCBC Wing Hang Bank

I thoroughly enjoyed my time as a MStat student. During my time here, apart from theory I was able to develop many skills which have proven to be vital to me for my career going forward. These include skills such as problem solving skills, advanced data analytics techniques, and also soft skills like job hunting skills. Currently I am working as a data analyst at 1% where I use the tools and skills I have developed during my MStat course to improve our business strategy to client. Working as a data analyst is exciting, each day brings new challenges.

Wu Qiyun [MStat Full-time Graduate 2019]

Senior Accountant, Data Analytics, Ernst & Young

The master of statistics of the University of Hong Kong enables students to acquire both a solid understanding of statistical theory and extensive knowledge about state-of-the-art applications. Thanks to the variety of courses, I could learn a lot about different applications of statistics and data analytics in different fields. Moreover, the programme provides me with the opportunity to meet with people from different backgrounds and we shared experience with each other. I am an actuary and there is an increasing focus on predictive analytics in my current field. A lot of the courses gave me an opportunity to meet and work with people from a wide range of professions. These all have definitely sharpened our techniques to cope with hands-on problems – an essential lifelong learning skill. Highly recommend this Programme to prospective students who are eager to gain exposure to the field of data science.

HD Chun To [IMStat Part-time Graduate 2019]

Quantitative Strategist, Asia Quantitative Equity Research, Morgan Stanley

The programme extends over not less than one academic year for full-time study and not less than two academic years for part-time study. Teaching will take place on the following dates from Monday to Saturday for courses having course codes STATXXXX, and on weekday evenings (7:00 – 10:00 p.m.) and Saturday mornings (9:30 a.m. – 12:30 p.m.) for courses having course codes STATXXXXX or STATXXXXX. All lectures are conducted in English at HKU.
The master of statistics of the University of Hong Kong is well designed for students to join industries with advanced analytics, machine learning, data science and other fields. The courses are suitable for both professionals to polish their quantitative skills and graduates to pursue further study. It offers me great exposure in statistical analysis, machine learning, data mining and data analysis, which are essential skills valued by international companies. It is also a challenging and up-to-date programme that is well-regarded by the state of the art and industries. Throughout the program, I was given a lot of support from the department, both academically and financially, to pursue my next career goal.

Wei Conghui [MStat Part-time Graduate 2019]

Regulatory Reporting Manager, OCBC Wing Hang Bank

Over the past 2 years, the MStat program brought me a fruitful experience. Not only did I learn about advanced data analytics techniques, but I also got a lot of hands-on experience in applying them to practical problems. It provided me with the right mix of statistical theory and statistical analysis and great exposure in statistical data mining and data analysis in different fields. Moreover, the program provides me with the opportunity to meet people from different backgrounds and we shared experience with each other. I am actuary and there is an increasing focus on predictive analytics in my current field. Hence the program gives me exposure in research foundation and ideas for how to apply the techniques I learnt to discover predictive patterns and relationships for business use.

Wong Cheuk Yin [MStat Part-time Graduate 2018]

Senior Actuarial Consultant, HSBC insurance (HK) Ltd

The Master of Statistics of the University of Hong Kong enables students to acquire both a solid understanding of statistical theory and extensive knowledge about the data analytics techniques. Due to the wide range of academic training and statistical data mining and data analysis industry, I have been able to learn more about new areas in statistics, data analytics and risk management. I have also enjoyed my time as an MStat student, and I would like to thank everyone for their support and encouragement. I am very grateful for the knowledge I have gained in my MStat studies. The program has prepared me well for my future career in financial services industry.

Alejandro COB/PENENO (MStat Full-time Graduate 2017)

Analyst in Finance Division, Morgan Stanley Asia International Limited

Innovative Data Mining Application Award Winning Team 2019

Programme Duration and Class Schedules

The programme extends over not less than one academic year for the full-time study, and not less than two academic years for the part-time study. Teaching time for Monday to Saturday for courses having course codes STATXXX, and on weekday evenings 7.00 – 10.00 p.m., and Saturday mornings 9.30 a.m. – 1.30 p.m. (and afternoons 2.00 – 5.00 p.m.). For courses having course codes STATXXXX or STATXXXX, all lectures are conducted in English at HKU.

Examples of backgrounds of admitted students in recent years:

- **HKSA Government departments/units**
  - Research Manager
  - Researcher/Scientist
  - Programmer
  - Statistical Writer
  - Statistical Officer

- **Education profession:**
  - Student Lecturer
  - Teacher
  - Officer/Editor
  - Research Assistant
  - Teaching Assistant

- **Current topics in Statistics (3 credits)**
  - The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics in statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics are selected based on research findings and the topics to follow the needs of the job market. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real-life problems.

- **STATA805 Bayesian statistics (3 credits)**
  - This course introduces Bayesian methodologies and computational techniques of Mark-to-chain Monte Carlo (MCMC) methods, which require integration of the knowledge they have learnt in the curriculum. A substantial written report is required.

- **STAT8017 Data mining techniques or equivalent (3 credits)**
  - This course is designed for students who wish to enhance their skills in data management using SAS (August, 2020).

- **STAT8021 Big data analytics (6 credits)**
  - The course aims at discussing the common properties of real networks and the recent development of statistical network models. Topics may include common network structures, community detection, centrality measures, and network analysis techniques.

- **STAT8036 Statistical methods for network data (3 credits)**
  - The six degrees of separation theorems that human interactions could be easily represented in the form of a network. Examples of networks include social networks, the World Wide Web, social networks such as Facebook or Twitter, genetic interaction networks and various collaboration networks such as movie actor collaboration networks and scientific paper collaboration networks. Despite the diversity in the nature of sources, the networks exhibit some common properties. For example, the distribution of the number of edges per node in the network follows a power-law distribution. The six degrees of separation theorems are of great importance in the field of social sciences and psychology. The course aims at discussing the common properties of real networks and the recent development of statistical methods for network analysis. Topics covered include network measures, community detection in graphs, preferential attachment random network models, exponential random graph models, models based on random point processes and the hidden network discovery on a set of dependent random variables.

- **STAT8044 Current topics in Statistics (3 credits)**
  - The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics in statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics are selected based on research findings and the topics to follow the needs of the job market. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real-life problems.

- **STATA808 Bayesian statistics (3 credits)**
  - This course introduces Bayesian methodologies and computational techniques of Mark-to-chain Monte Carlo (MCMC) methods, which require integration of the knowledge they have learnt in the curriculum. A substantial written report is required.

- **STAT8017 Data mining techniques or equivalent (3 credits)**
  - This course is designed for students who wish to enhance their skills in data management using SAS (August, 2020).

- **STAT8021 Big data analytics (6 credits)**
  - The course aims at discussing the common properties of real networks and the recent development of statistical network models. Topics may include common network structures, community detection, centrality measures, and network analysis techniques.

- **STAT8036 Statistical methods for network data (3 credits)**
  - The six degrees of separation theorems that human interactions could be easily represented in the form of a network. Examples of networks include social networks, the World Wide Web, social networks such as Facebook or Twitter, genetic interaction networks and various collaboration networks such as movie actor collaboration networks and scientific paper collaboration networks. Despite the diversity in the nature of sources, the networks exhibit some common properties. For example, the distribution of the number of edges per node in the network follows a power-law distribution. The six degrees of separation theorems are of great importance in the field of social sciences and psychology. The course aims at discussing the common properties of real networks and the recent development of statistical methods for network analysis. Topics covered include network measures, community detection in graphs, preferential attachment random network models, exponential random graph models, models based on random point processes and the hidden network discovery on a set of dependent random variables.

- **STAT8044 Current topics in Statistics (3 credits)**
  - The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics in statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics are selected based on research findings and the topics to follow the needs of the job market. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real-life problems.

- **STATA808 Bayesian statistics (3 credits)**
  - This course introduces Bayesian methodologies and computational techniques of Mark-to-chain Monte Carlo (MCMC) methods, which require integration of the knowledge they have learnt in the curriculum. A substantial written report is required.

- **STAT8017 Data mining techniques or equivalent (3 credits)**
  - This course is designed for students who wish to enhance their skills in data management using SAS (August, 2020).

- **STAT8021 Big data analytics (6 credits)**
  - The course aims at discussing the common properties of real networks and the recent development of statistical network models. Topics may include common network structures, community detection, centrality measures, and network analysis techniques.

- **STAT8036 Statistical methods for network data (3 credits)**
  - The six degrees of separation theorems that human interactions could be easily represented in the form of a network. Examples of networks include social networks, the World Wide Web, social networks such as Facebook or Twitter, genetic interaction networks and various collaboration networks such as movie actor collaboration networks and scientific paper collaboration networks. Despite the diversity in the nature of sources, the networks exhibit some common properties. For example, the distribution of the number of edges per node in the network follows a power-law distribution. The six degrees of separation theorems are of great importance in the field of social sciences and psychology. The course aims at discussing the common properties of real networks and the recent development of statistical methods for network analysis. Topics covered include network measures, community detection in graphs, preferential attachment random network models, exponential random graph models, models based on random point processes and the hidden network discovery on a set of dependent random variables.

- **STAT8044 Current topics in Statistics (3 credits)**
  - The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics in statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics are selected based on research findings and the topics to follow the needs of the job market. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real-life problems.

- **STATA808 Bayesian statistics (3 credits)**
  - This course introduces Bayesian methodologies and computational techniques of Mark-to-chain Monte Carlo (MCMC) methods, which require integration of the knowledge they have learnt in the curriculum. A substantial written report is required.

- **STAT8017 Data mining techniques or equivalent (3 credits)**
  - This course is designed for students who wish to enhance their skills in data management using SAS (August, 2020).

- **STAT8021 Big data analytics (6 credits)**
  - The course aims at discussing the common properties of real networks and the recent development of statistical network models. Topics may include common network structures, community detection, centrality measures, and network analysis techniques.

- **STAT8036 Statistical methods for network data (3 credits)**
  - The six degrees of separation theorems that human interactions could be easily represented in the form of a network. Examples of networks include social networks, the World Wide Web, social networks such as Facebook or Twitter, genetic interaction networks and various collaboration networks such as movie actor collaboration networks and scientific paper collaboration networks. Despite the diversity in the nature of sources, the networks exhibit some common properties. For example, the distribution of the number of edges per node in the network follows a power-law distribution. The six degrees of separation theorems are of great importance in the field of social sciences and psychology. The course aims at discussing the common properties of real networks and the recent development of statistical methods for network analysis. Topics covered include network measures, community detection in graphs, preferential attachment random network models, exponential random graph models, models based on random point processes and the hidden network discovery on a set of dependent random variables.

- **STAT8044 Current topics in Statistics (3 credits)**
  - The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics in statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics are selected based on research findings and the topics to follow the needs of the job market. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real-life problems.
Tuition Fees
The composition fee for the full-time programme is HK$186,000# for the 2020 intake and that for the part-time programme is HK$93,000# per year for two years. The fee shall be payable in two instalments over one year for full-time study or in four instalments over two years for part-time study. In addition, students are required to pay Caution Money (HK$350), refundable on graduation subject to no claims being made, and Graduation Fee (HK$350).

The University allows Occasional Students to enroll in individual courses without registering in any particular programme of study. Tuition Fee for an Occasional Student is HK$3,100# per credit in the academic year 2020-21. # Subject to approval

Target Students
It is a programme ideal for
1. those whose wish to advance their quantitative and analytical skills to prepare for a data-focused career path, and
2. those who wish to pursue further study in the field of statistics after studying science, social sciences, engineering, medical sciences, information systems, business and finance in their undergraduate studies.

Admission Requirements
A Bachelor's degree with Honours, or an equivalent qualification, with knowledge of matrices and calculus, introductory statistics and linear modelling.

Application
Main Round: December 15, 2019
Clearing Round: 12 noon, January 31, 2020

Programme Details:
https://saasweb.hku.hk/programme/mstat.php

Online application:
https://aal.hku.hk/tpg/

Enquiries
Ms Clara Lian
Department of Statistics & Actuarial Science
Tel: 3917 6042   Email: mstat@saas.hku.hk

Support for International Students
https://cedars.hku.hk/
Useful information for students:
https://cedars.hku.hk/publication.php