Master of Statistics
Rejuvenating skills of professionals in statistical analysis

Practical skills
Professional views
Advanced knowledge

Big data analytics
Data mining
Social network
Spatial data analysis
Blockchain data analytics
Algorithmic trading
Marketing analytics

Apply now for entry in September 2021
IS THE PROGRAMME FOR YOU

Why this Programme
- Be a knowledgeable statistician in principles and practice
- Experience hands-on applications of methodologies with powerful statistical software
- Select a theme of your interest (Risk Management / Data Analytics)
- Could select up to 7 electives from the Department's research postgraduate courses
- Join the programme of more than 30 years in curriculum development and delivery

What the Programme Covers
- Advanced knowledge in statistics and practical skills of applying appropriate statistical models and techniques, and developing new knowledge and skills through life-long learning
- Hands-on training in statistical and risk analyses using commercial software, enhancing competency in data analytic jobs which require advanced computational skills
- Critically evaluates and makes proper use of models and techniques for data analyses and risk management, and appraises related ethical issues

World-class Rankings of HKU

- Times Higher Education (THE)
  - #3 Asia Rankings 2020
  - #22 World Rankings 2021
- Quacquarelli Symonds (QS)
  - #3 Asia Rankings 2020
  - #22 World Rankings 2021
- Eminent Subject Ranking
  - QS World University Rankings by Subject 2020:
    - #50 Statistics & Operational Research

Top-notch Scientists in the Faculty
- Clarivate Analytics’ Essential Science Indicators 2019
  - 15.4% of our professoriate staff are the world’s Top 1% scholars

Tuition fees
- Composition fee: HK$195,000
  - 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 enrol in individual courses without registering in any particular programme of study; tuition fee for an Occasional Student is HK$3,250 per credit

Programme duration
- Full-time: 1 year
- Part-time: 2 years

Study load
- Credits: 60 credits
- Learning hours: 1,500 hours* (including 120-180 hours for project (for students taking STAT8002 or STAT8089) and contact hours of 216-360)

Class schedule/format
- Teaching takes place mainly on weekday evenings and Saturdays
- Optional summer courses (August, 2021)
  - Preparatory courses in matrices and calculus, and introductory statistics, for all students who need to rejuvenate their skills
  - Tutorials in R covering data handling, graphics, mathematical functions and some basic statistical techniques
  - Tutorials in SAS for all the students who need to rejuvenate their skills in data management using SAS

Medium of Instruction
- English

Assessment
- Mainly written coursework and/or examinations
- A project on a topic of the student’s choice

Department of Statistics and Actuarial Science

Strongly tied with international professional bodies in statistics and actuarial science, the Department of Statistics and Actuarial Science (SAAS) enjoys a very high profile in both teaching and research. SAAS research areas span from classical areas of statistics, to a range of applied domains, and the rapidly developing areas of big data and artificial intelligence. The Big Data Research Cluster and the HKU-TCL Joint Research Centre for Artificial Intelligence have been established to serve as platforms for interdisciplinary research.
Where will this Programme Lead You

Targeted Taught Postgraduate Programmes Fellowships Scheme

Master of Statistics Outstanding Performance Scholarship

Entrance Scholarship for the Master of Statistics

Examples of backgrounds of admitted students in recent years:

HKSAR Government departments/units:
- Research Manager
- Researcher (Statistics)
- Immigration Officer
- Statistical Officer

Education profession:
- Consultant
- Senior Lecturer
- Teacher
- Website Editor
- Research Assistant

Banking and finance profession:
- Executive Director
- Vice President
- Head of Business Intelligence
- Senior Manager
- Business Analyst Manager
- Credit Risk Manager
- Financial Crime Compliance Assistant Manager

Private companies:
- Director
- Assistant Vice President
- Assistant Vice President
- Director
- Head of Corporate Administration and Operation
- Consulting Engineer
- Technical Service Delivery Manager
- Deputy Manager
- Data Scientist
- Business Intelligence Analyst
- Marketing Executive
- Solution Scheme Specialist
- Software Engineer
- Analyst Programmer
- Quantitative Developer
- Software Developer
- System Analyst
- Trading Analyst
- Senior Industrial Engineering Officer
- Data Analytics Engineer

Transferable skills
- Equips students to make informed decisions on complex real-life problems encountered in the data explosion era
- Students will be able to communicate effectively with the layman on statistical issues
- Emphasises 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

Career development
- To nurture confident statisticians who are able to provide professional views on statistical issues

"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."

—The 2019 Jobs Related Report by www.careerast.com

"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, USA

Targeted students

Those who wish to advance their quantitative and analytical skills to prepare for a data-focused career path

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

Showcase your academic merit by applying for one of these academic merit scholarships.

"The Master of Statistics programme is well designed to offer extensive training in theories and practice of statistics. It provides a wide range of courses from fundamentals of statistics to more theme-specific elective courses, such as data mining techniques and big data analytics. During my two-years’ time at HKU, I was able to not only hone my knowledge in statistics but also gain exposure in programming languages such as Python, SAS, and R, which are essential skill sets in many industries. Most of the courses generally have a good balance between theories and practical applications, I would highly recommend this programme to anyone who would like to gain knowledge in the field of statistics and data science."

Bohyun KIM, Class of 2020
Associate, PIMCO Asia Limited

"My two-year part-time study in MStat has been very fruitful and rewarding, preparing me for my career and beyond. Having worked in the financial sector for some time, I have seen first-hand how important it is to have a statistical mindset, and the MStat programme has been very fulfilling in this regard. Not only did it provide me with the analytical and quantitative skill sets required to navigate the age of Big Data, it also has deep coverage on the theoretical aspects underlying the statistical techniques used. A significant proportion of the coursework also focuses on real-life applications, so students of this programme can expect to bring immediate impact on their jobs."

Kwan Wah CHAN, Class of 2020
Associate Director, UBS Group AG

Lifelong Learning Prizes in Statistics Scholarship

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

Entrance Scholarship for the Master of Statistics

There is an Entrance Scholarship for Master of Statistics of HK$20,000, awarded annually to new MStat students on the basis of academic merit, financial need upon admission and, if necessary, interview performance.

Reimbursable Courses by Continuing Education Fund (CEF)*

6 courses in the programme have been included in the list of reimbursable courses under the CEF:
- 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

All CEF applicants are required to attend at least 70% of the courses before they are eligible for fee reimbursement under the CEF.

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

**Compulsory courses**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>STAT7101 Fundamentals of statistical inference</td>
</tr>
<tr>
<td>6</td>
<td>STAT7102 Advanced statistical modelling</td>
</tr>
</tbody>
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**Students with prior background have to take a more advanced course from the same area as replacement:**

<table>
<thead>
<tr>
<th>REPLACES...</th>
<th>WITH...</th>
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<tbody>
<tr>
<td>STAT7101</td>
<td>STAT6009 Research methods in statistics (6 credits) or STAT7102 Multivariate methods (6 credits)</td>
</tr>
</tbody>
</table>

**Theme-specific elective courses**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course Name</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Risk Management theme</td>
</tr>
<tr>
<td>plus 24 credits from</td>
<td>STAT6003 Financial data analysis (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6005 Advanced quantitative risk management and finance (6 credits)</td>
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<tr>
<td></td>
<td>STAT6006 Operational risk and insurance analytics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6007 Time series forecasting (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6008 Statistical methods in economics and finance (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6009 Risk management and Basel Accords (6 credits)</td>
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<tr>
<td></td>
<td>STAT6010 Actuarial statistics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6011 Data mining techniques (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6012 Quantitative strategies and algorithmic trading (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6020 Big data analytics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6021 Blockchain data analytics (3 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6022 Structural equation modelling (3 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6023 Bayesian statistics (2 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6024 Statistical methods for network data (3 credits)</td>
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<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course Name</th>
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<tbody>
<tr>
<td></td>
<td>Data Analytics theme</td>
</tr>
<tr>
<td>plus 24 credits from</td>
<td>STAT6001 Computational statistics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6002 Spatial data analysis (6 credits)</td>
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<td></td>
<td>STAT6003 Multivariate methods (6 credits)</td>
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<td></td>
<td>STAT6004 Programming for data science (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6005 Time series forecasting (6 credits)</td>
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<tr>
<td></td>
<td>STAT6006 Biostatistics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6007 Data mining techniques (8 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT6008 Structural equation modelling (3 credits)</td>
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<td></td>
<td>STAT6009 Marketing analytics (6 credits)</td>
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<td></td>
<td>STAT6010 Financial data analysis (6 credits)</td>
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<td></td>
<td>STAT6011 Data mining techniques (6 credits)</td>
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<tr>
<td></td>
<td>STAT6012 Quantitative strategies and algorithmic trading (6 credits)</td>
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<td></td>
<td>STAT6013 Big data analytics (6 credits)</td>
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<td></td>
<td>STAT6014 Blockchain data analytics (3 credits)</td>
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<tr>
<td></td>
<td>STAT6015 Bayesian statistics (2 credits)</td>
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<tr>
<td></td>
<td>STAT6016 Statistical methods for network data (3 credits)</td>
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**Other elective courses**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>plus at least 18 credits from</td>
<td>STAT6009 Research methods in statistics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT610 Advanced probability (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT7006 Design and analysis of sample surveys (6 credits)</td>
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<tr>
<td></td>
<td>STAT7007 Socio-economic statistics for business and public policies (3 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT8000 Workshop on spreadsheet modelling and database management (3 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT8300 Career development and communication workshop (non-credit bearing)</td>
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<tr>
<td></td>
<td>STAT8304 Current topics in statistics (3 credits)</td>
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<tr>
<td></td>
<td>Any theme-specific elective courses</td>
</tr>
<tr>
<td></td>
<td>Any capstone courses</td>
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</table>

**Capstone requirement**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>plus 6 credits from</td>
<td>STAT8002 Project (8 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT8007 Data mining techniques (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT8008 Practicum (6 credits)</td>
</tr>
<tr>
<td></td>
<td>STAT8009 Capstone project (6 credits)</td>
</tr>
</tbody>
</table>

Remarks:
1. Apart from the 2 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.
2. 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.
3. 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.
4. The programme structure will be reviewed from time to time and is subject to change.

Compulsory Courses

**STAT7101 Fundamentals of statistical inference**

Motivated by real problems involving uncertainty and variability, this course introduces the basic concepts and principles of statistical inference and decision-making. Contents include: large-sample theories; estimation theory; likelihood principle; maximum likelihood estimation; hypotheses testing; likelihood ratio tests; nonparametric inference; computer-intensive methods such as EM algorithm and bootstrap methods. (Only under exceptional academic circumstances can this compulsory course be replaced by an elective course.)

**STAT7102 Advanced statistical modelling**

This course introduces modern methods for constructing and evaluating statistical models and their implementation using popular computing software, such as R or Python. It will cover both the underlying principles of each modelling approach and the model estimation procedures. Topics from: (i) Linear regression models; (ii) Generalised linear models; (iii) Model selection and regularisation; (iv) Kernel and local polynomial regression; selection of smoothing parameters; (v) Generalised additive models; (vi) Hidden Markov models and Bayesian networks.

Elective Courses

**STAT6009 Research methods in statistics**

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 applications of state-of-the-art statistical techniques and their underlying theory. Contents may be selected from: (1) Basic asymptotic methods: modes of convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; (2) Parametric and nonparametric likelihood methods: high-order approximations; profile likelihood and its variants; signed likelihood ratio statistics; empirical likelihood; (3) Nonparametric statistical inference: sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression: density estimation; kernel methods; (4) Computationally-intensive methods: cross-validation; bootstrap; permutation methods; (5) Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator; estimating functions; (6) Other topics as determined by the instructor.

**STAT6010 Advanced probability**

This course provides an introduction to measure theory and probability. The course will focus on some basic concepts in theoretical probability which are important for students to do research in actuarial science, probability and statistics. Contents include: sigma-algebra, measurable space, measure and probability, measure space and probability space, measurable functions, random variables, integration theory, characteristic functions, convergence of random variables, conditional expectations, martingales.

**STAT6011 Computational statistics**

This course aims to give postgraduate students in statistics a background in modern computationally intensive methods in statistics. It emphasises 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: Bayesian statistics, Markov chain Monte Carlo methods including Gibbs sampler, the Metropolis-Hastings algorithm, and data augmentation; Generation of random variables including the inversion methods, rejection sampling, the sampling/importance resampling method; Optimisation techniques including Newton’s method, expectation-maximisation (EM) algorithm and its variants, and minorisation-maximisation (MM) algorithms; Integration including Laplace approximations, Gaussian quadrature, the importance sampling method, Numerical optimisation and integration, EM algorithm and its variants, Simulation and Monte Carlo integration, Importance sampling and variance reduction techniques; and other topics such as Hidden Markov models, neural networks, and Bootstrap methods.
STAT6013 Financial data analysis
This course aims at introducing statistical methodologies in analysing financial data. Financial applications and statistical methodologies are intertwined in all lectures. Contents include: recent advances in modern portfolio theory, copula, market microstructure and high frequency data analysis, FinTech applications with various computational tools such as artificial neural networks, Kalman filters and blockchain data analysis.

STAT6015 Advanced quantitative risk management and finance
This course covers statistical methods and models of importance to risk management and finance and links finance theory to market practice via statistical modelling and decision making. Emphasis will be put on empirical analyses to address the discrepancy between finance theory and market data. Contents include: Elementary Stochastic Calculus; Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Simulating the value of options and the value-at-risk for risk management; Review of univariate volatility models; multivariate volatility models; Value-at-risk and expected shortfall; estimation, back-testing and stress testing; Extreme value theory for risk management.

STAT6017 Operational risk and insurance analytics
This course aims to provide the foundation of operational risk management and insurance. Special emphasis will be put on the analytical and modelling techniques for operational risk and insurance. Contents include fundamentals of operational risk and Basel regulation, loss distribution, estimation of risk models, copula and modelling dependence, insurance and risk transfer for operational risk.

STAT705 Multivariate methods
In many disciplines the basic data on an experimental unit consist of a vector of possibly correlated measurements. Examples include the chemical composition of a rock; the results of clinical observations and tests on a patient; the household expenditures on different commodities. Through the challenge of problems in a number of fields of application, this course considers appropriate statistical models for explaining the patterns of variability of such multivariate data. Topics include: multiple, partial and canonical correlation; multivariate regression; tests on means for one-sample and two-sample problems; profile analysis; test for covariances structure; multivariate ANOVA; principal components analysis; factor analysis; discriminant analysis and classification.

STAT7006 Design and analysis of sample surveys
Inferring the characteristics of a population from those observed in a selection or sample from that population is a situation often forced on us for economic, ethical or technological reasons. Against the background of practical situations, this course considers the basic principles, practice and design of sampling techniques to produce objective answers free from bias. Emphasis will be on current and local problems.

STAT7007 Categorical data analysis
Many social and medical studies, especially those involving questionnaires, contain large amounts of categorical data. Examples of categorical data include presence or absence of disease (yes / no), mode of transportation (bus, taxi, railway), attitude toward an issue (strongly disagree, disagree, agree, strongly agree). This course focuses on analysing categorical response data with emphasis on hands-on training of analysing real data using statistical software such as SAS. Consulting experience may be presented in the form of case studies. Topics include: classical treatments of 2 and 3-way contingency tables, measures of association and nonparametric methods; generalised linear models, logistic regression for binary, multinomial and ordinal data, loglinear models, Poisson regression; Modelling repeated measurements; generalised estimating equations.

STAT7008 Programming for data science
In the big data era, it is very easy to collect huge amounts of data. Capturing and exploiting the important information contained within such datasets poses a number of statistical challenges. This course aims to provide students with a strong foundation in computing skills necessary to use R or Python to tackle some of these challenges. Possible topics to be covered may include exploratory data analysis and visualisation, collecting data from a variety of sources (e.g., Excel, web-scraping, APIs and others), object-oriented programming concepts and scientific computation tools. Students will learn to create their own R packages or Python libraries.

STAT7301 Socio-economic statistics for business and public policies
Huge volumes of socio-economic statistics are compiled and published on society and the economy by Governments and other bodies locally and elsewhere. Strong ability of business managers and authorities concerned to make effective reference to relevant data greatly enhances the quality of decision making in business and public policy processes. Students will learn about globally adopted standards for the compilation and dissemination of important data, such as those on population, labour, economic structure (in particular GDP), productivity, prices, trade, finance, housing, health and education; how to obtain them; and appropriate methods of utilising them for the purposes of understanding socio-economic phenomena and making sound decisions. Ample practical examples drawn from Hong Kong and elsewhere will be presented.

STAT8000 Workshop on spreadsheet modelling and database management
This course aims to enhance students’ IT knowledge and skills which are essential for career development of statistical and risk analysts. The course contains a series of computer hands-on workshops on Excel VBA programming, MS-Access and SQL and C++ basics.

STAT8002 Project
A project in any branch of statistics or probability will be chosen under the supervision of individual staff member. A substantial written report is required. Availability of this course is subject to approval.

STAT8003 Time series forecasting
A time series consists of a set of observations on a random variable taken over time. Such series arise naturally in climatology, economics, finance, environmental research and many other disciplines. In additional to statistical modelling, the course deals
WHAT YOU WILL LEARN

with the prediction of future behaviour of these time series. This course distinguishes different types of time series, investigates various representations for them and studies the relative merits of different forecasting procedures.

STAT8007 Statistical methods in economics and finance
This course provides a comprehensive introduction to state-of-the-art statistical techniques in economics and finance, with emphasis on their applications to time series and panel data sets in economics and finance. Topics include: regression with heteroskedastic and/or autocorrelated errors; instrumental variables and two-stage least squares; panel time series model; unit root tests, co-integration, error correction models; and generalised method of moments.

STAT8014 Risk management and Basel Accords
Being an important financial centre, Hong Kong has always been on the alert for risk in the banking and financial industry. We have weathered many attacks and crises over the past decades. Following the deep and long lasting global financial crisis started in 2007/08, this risk has been the primary focus of most people. This course will provide, and it is paramount for people in or related to the industry be fully aware of the relevant risk management, including the nature, the culture, the framework, the cycle, the measurement (with focus on market, credit and operational risks) and the mitigation techniques, along with the knowledge of the Basel Accords and practical critical issues.

STAT8015 Actuarial statistics
The main focus of this module will be on financial mathematics of compound interest with an introduction to life contingencies and statistical theory of risk. Topics include simple and compound interest, annuities certain, yield rates, survival models and life tables, population studies, life annuities, assurances and premiums, reserves, joint life and last survivor statuses, multiple decrement tables, expenses, individual and collective risk theory.

STAT8016 Biostatistics
Statistical methodologies and applications in fields of medicine, clinical research, epidemiology, public health, biology and biomedical research are considered. The types of statistical problems encountered will be motivated by experimental data sets. Important topics include design and analysis of randomised clinical trials, group sequential designs and crossover trials; survival studies; diagnosis; risks; statistical analysis of the medical process.

STAT8017 Data mining techniques
With the rapid developments in computer and data storage technologies, the fundamental paradigms of classical data analysis are mature for change. Data mining techniques aim at helping people to work smarter by revealing underlying structure and relationships in large amounts of data. This course takes a practical approach to introduce the new generation of data mining techniques and show how to use them to make better decisions. Topics include data preparation, feature selection, association rules, decision trees, bagging, random forests and gradient boosting, cluster analysis, neural networks, introduction to text mining.

STAT8019 Marketing analytics
This course aims to introduce various statistical models and methodology used in marketing research. Special emphasis will be put on marketing analytics and statistical techniques for marketing decision making including market segmentation, market response models, consumer preference analysis and conjoint analysis. Contents include market response models, statistical methods for segmentation, targeting and positioning, statistical methods for new product design.

STAT8020 Quantitative strategies and algorithmic trading
Quantitative trading is a systematic investment approach that consists of identification of trading opportunities via statistical data analysis and implementation via computer algorithms. This course introduces various methodologies that are commonly employed in quantitative trading.
WHAT YOU WILL LEARN

The first half of the course focuses at strategies and methodologies derived from the data snapshotted at daily or minute frequency. Some specific topics are: (1) techniques for trading trending and mean-reverting instruments, (2) statistical arbitrage and pairs trading, (3) detection of “time-series” mean reversion or stationarity, (4) cross-sectional momentum and contrarian strategies, (5) back-testing methodologies and corresponding performance measures, and (6) Kelly formula, money and risk management. The second half of the course discusses statistical models of high frequency data and related trading strategies. Topics that planned to be covered are: (7) introduction of market microstructure, (8) stylised features and models of high frequency transaction prices, (9) limit order book models, (10) optimal execution and smart order routing algorithms, and (11) regulation and compliance issues in algorithmic trading.

STAT8021 Big data analytics
The recent explosion of social media and the computerisation of every aspect of life resulted in the creation of volumes of mostly unstructured data (big data): web logs, e-mails, videos, speech recordings, photographs, tweets and others. This course aims to provide students with knowledge and skills of some advanced analytics and statistical modelling for solving big data problems. Topics include recommender system, deep learning: CNN, RNN, LSTM, GRU, natural language processing, sentiment analysis and topic modelling. Students are required to possess basic understanding of Python language.

STAT8088 Practicum
This course is open to students of Master of Statistics Programme only. It provides students with first-hand experience in the applications of academic knowledge in a real-life work environment. To be eligible, students should be undertaking a statistics-related or risk-management-related practicum with no less than 160 hours in at least 20 working days spent in a paid 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 summer semester for full-time students or during the second year for part-time students.

STAT8089 Capstone project
This project-based course aims to provide students with capstone experience to work on a real-world problem and carry out a substantial data analysis project which requires integration of the knowledge they have learnt in the curriculum. Students will work in small groups under the guidance of their supervisor(s). The project topic is not limited to academic context, but can also be extended to a community or corporate outreach project. Students will need to find an interesting topic of their own, conduct literature search regarding the most recent research related to the problem, make suggestions to improve the current situations or even solve the problem identified in their project. A substantial written report is required.

STAT8300 Career development and communication workshop
The course is specially designed for students who wish to sharpen their communication and career preparation skills through a variety of activities including lectures, skill-based workshops, small group discussion and role plays. All of which aim to facilitate students in making informed career choices, provide practical training to enrich communication, presentation, time management and advanced interview skills, and to enhance students’ overall competitiveness in the employment markets.

STAT8302 Structural equation modelling
Structural Equation Modelling (SEM) is a general statistical modelling technique to establish relationships among variables. A key feature of SEM is that observed variables are understood to represent a small number of “latent constructs” that cannot be directly measured, only inferred from the observed measured variables. This course covers the theories of structural equation models and their applications. Topics may include path models, confirmatory factor analysis, structural equation models with latent variables, Sub-models including multiple group analysis, MIMIC model, second order factor analysis, two-wave model, and simplex model, model fitness, model identification, and Comparison with competing models.

STAT8304 Current topics in statistics
The purpose of this course is to broaden the students’ knowledge of statistics by studying some contemporary topics motivated by applications of statistics. These topics will build on the theory and methods covered in the compulsory courses. The topics offered each year depend on student interests and staff availability. After completing the course, students will acquire knowledge and skills of some advanced statistical techniques for solving real life problems.

STAT8305 Bayesian statistics
This course introduces Bayesian methodologies and computational techniques of Markov chain Monte Carlo (MCMC). It covers fundamental Bayesian concepts, modelling and inference, including prior specification, posterior distribution, posterior predictive, Bayes factor, Bayesian hypothesis testing, Bayesian hierarchical modelling, and Bayesian decision theoretic analysis. From the computational perspective, it covers rejection sampling, importance sampling, Metropolis-Hastings algorithm, Gibbs sampling, and data augmentation MCMC techniques. Statistical software R and Python will be used for Bayesian computation.
STAT8308 Blockchain data analytics

In this course, we start by studying the basic architecture of a blockchain. Then we move on to several major applications including (but not limited to) cryptocurrencies, fintech and smart contracts. We conclude by examining the cybersecurity issues facing the blockchain ecosystems.

Staff List

Dr Y K CHUNG
BSc, MPhil CUHK; PhD HK

The paradigm shift from traditional statistical techniques to big data analytics opens up new opportunities and challenges. There is no better time to be a statistician than now.

WHAT YOU WILL LEARN

Course Description

STAT8306 Statistical methods for network data

The six degrees of separation theorises that human interactions could be easily represented in the form of a network. Examples of networks include router networks, the World Wide Web, social networks (e.g. Facebook or Twitter), genetic interaction networks and various collaboration networks (e.g. movie actor collaboration network and scientific paper collaboration network). Despite the diversity in the nature of sources, the networks exhibit some common properties. For example, both the spread of disease in a population and the spread of rumors in a social network are in sub-logarithmic time. This course aims at discussing the common properties of real networks and the recent development of statistical network models. Topics may include common 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.

More course information at: https://www.scifac.hku.hk/prospective/tpg/MStat

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

STAT8308 Blockchain data analytics

In this course, we start by studying the basic architecture of a blockchain. Then we move on to several major applications including (but not limited to) cryptocurrencies, fintech and smart contracts. We conclude by examining the cybersecurity issues facing the blockchain ecosystems.

Programme Director

Dr Y K CHUNG
BSc, MPhil CUHK; PhD HK
Admissions

Requirements

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

How to apply

Main Round: **12 noon, December 15, 2020 (GMT+8)**
Clearing Round: **12 noon, February 1, 2021 (GMT+8)**

Online application

aal.hku.hk/tpg

Further Information

Programme details

bit.ly/2Dq5HHJ  bit.ly/3iKoRFO

Support for students

www.cedars.hku.hk/

Enquiries

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