

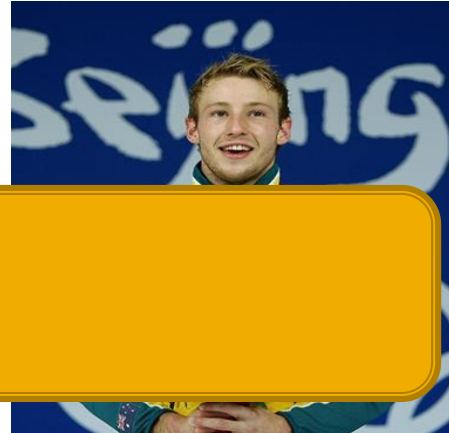
Major in Statistics

Bachelor of Science

(4-year Curriculum)

What is **STATISTICS** about?

Data / Observations



Statistical methods



Inference about "TRUTH" / Decision-making

Applications

whenever you want to study data...

i.e. in nearly all disciplines!

Gold Medalist
Louganis, Gregory



Silver Medalist
Xiong, Ni (熊倪)



Gold Medalist
Mitcham, Matthew

Silver Medalist
Zhou, Luxin (周呂鑫)



Results of final (10th round) dive

Men Platform Diving Final Dive 10/Sept. 27

Hommes Plongeon de Haut-vol Finale Plongeon 10/27 Sept

Order Ordre	Rank Rang	Ctry Pays	Name	Type Saut	Diff Coef	Judge / Juge							Total
						1	2	3	4	5	6	7	
1	9	JPN	Yamagishi, Isao	405 B	2.8	6.0	6.0	7.0	7.0	6.5	7.0	6.5	55.44
2	12	MEX	Mondragon, Jorge	307 C	3.4	3.0	4.0	3.5	4.0	4.0	4.5	4.5	40.80
3	3	MEX	Mena, Jesus	5237D	3.2	8.0	7.5	7.5	7.5	8.0	7.5	8.0	73.92
4	7	CAN	Bedard, David	5237D	3.2	7.0	6.0	6.0	7.0	6.5	6.0	6.5	61.44
5	8	GDR	Haage, Steffen	5237D	3.2	6.0	6.5	6.0	5.5	6.5	6.0	6.0	58.56
6	4	URS	Tchogovadze, Gueorgui	407 C	3.2	7.0	7.5	7.5	7.5	8.0	7.5	7.0	71.04
7	10	USA	Jeffrey, Patrick	407 C	3.2	5.5	5.5	4.5	6.0	6.0	5.5	5.5	53.76
8	6	GDR	Hempel, Jan	5237D	3.2	6.5	7.5	6.0	6.5	7.0	6.5	6.5	63.36
9	5	URS	Timochinine, Vladimir	5237D	3.2	7.0	7.5	7.0	7.0	7.0	7.0	7.0	67.20
10	11	CHN	Li, Kongzheng	5337D	3.3	5.0	6.0	5.5	5.0	4.5	6.5	5.5	53.46
11	2	CHN	Xiong, Ni	407 C	3.2	8.5	8.5	9.0	9.0	7.0	8.5	8.5	82.56
12	1	USA	Louganis, Gregory	307 C	3.4	8.5	8.5	8.5	8.5	8.0	8.5	9.0	86.70

12 finalists

7 judges



Results of final (6th round) dive

highest in Olympic history

NOC	Name	Dive No.	DD	Judge's Score							Dive Points	Dive Rank	Total Points	Overall Rank
				J1	J2	J3	J4	J5	J6	J7				
Australia	MITCHAM Matthew	5255B	3.8	10	9.5	10	10	9	9.5	10	112.1	1	537.95	1
China	ZHOU Luxin	307C	3.4	6.5	7.5	7	7.5	6	8	8	74.8	8	533.15	2
Russian Fed.	GALPERIN Gleb	5255B	3.8	10	8.5	9	9.5	8.5	9	9	102.6	2	525.8	3
China	HUO Liang	5255B	3.8	6	7.5	8.5	7	8	8	7	85.5	5	508.4	4
Cuba	GUERRA OLIVA Jose Antonio	5255B	3.8	8.5	8.5	9	8.5	8.5	9	8.5	96.9	3	507.15	5
Australia	HELM Mathew	5253B	3.4	8.5	8.5	8.5	8.5	8.5	9	9	86.7	4	467.7	6
Great Britain	DALEY Thomas	307C	3.4	5.5	6.5	6	6	7.5	6.5	7.5	64.6	10	463.55	7
Mexico	PACHECO Rommel	5253B	3.4	8	8	8	8	8.5	8	8.5	81.6	7	460.2	8
Germany	HAUSDING Patrick	5255B	3.8	6	6	6.5	6.5	6.5	7	6.5	74.1	9	448.3	9
United States	BOUDIA David	5255B	3.8	3.5	3.5	4	4	4	4.5	3.5	43.7	12	441.45	10
Colombia	URAN Juan Guillermo	207B	3.6	4	4.5	5	4.5	5	4	4.5	48.6	11	414.8	11
United States	FINCHUM Thomas	5253B	3.4	8.5	8	8.5	8.5	8	8	8.5	85	6	412.65	12

12 finalists

7 judges

How fair were the Olympic judges?

7 judges



Any judge biased **towards**/against any finalist?



12 finalists

Major in Statistics

Bachelor of Science

(4-year Curriculum)

Structure of curriculum...

7 introductory level courses (42 credits)

- SCNC1111 Scientific method & reasoning
- SCNC1112 Fundamentals of modern science
- *MATH1013 University mathematics II
- *MATH2014 Multivariable calculus & linear algebra
- *STAT1600 **Statistics: ideas & concepts**
- *STAT2601 **Probability and statistics I**
- *STAT2602 **Probability and statistics II**

**** replaced by other advanced level STAT course(s) if already taken to fulfill other majors/minors***

Mathematical background adequate?

- Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent
- Otherwise, strongly advised to take **MATH1011 University Mathematics I** in Semester 1.

What do we need from your Mathematics?

- Set notation and theory
- Functions (*incl.* limits, continuity)
- Sequences, series
- Basic calculus (*incl.* partial differentiation, double integration)
- Vectors, matrices (basic operations)

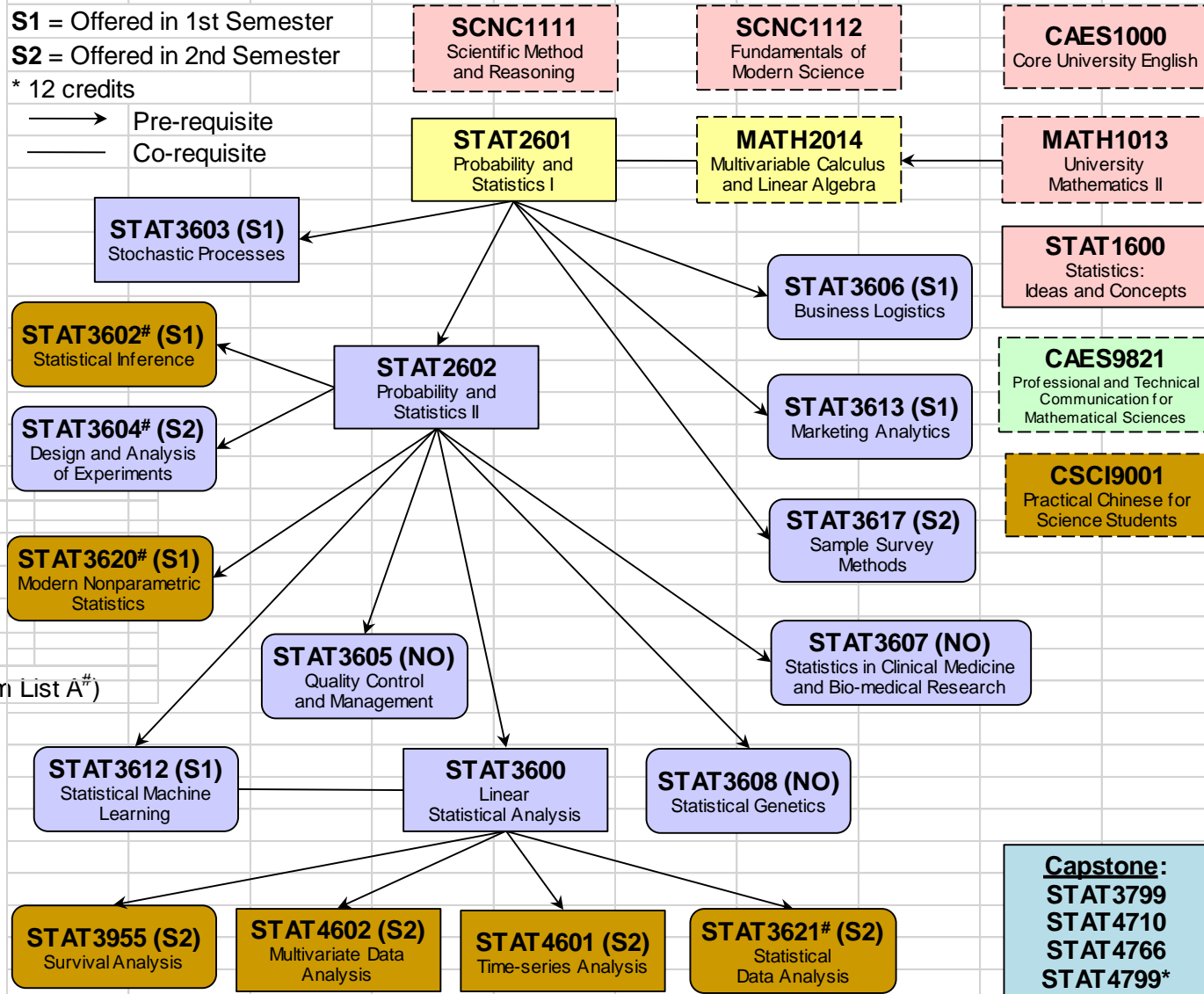
Suggested / Example Structure of BSc (Major in Statistics) Curriculum

Year	One		Two	
Semester	One	Two	One	Two
Disciplinary Core	MATH1013 University Mathematics II	MATH2014 Multivariable Calculus and Linear Algebra	STAT2601 Probability and Statistics I	STAT2602 Probability and Statistics II
Science Foundation Courses	SCNC1111 Scientific Method and Reasoning	SCNC1112 Fundamentals of Modern Science		
Common Core	Six common core courses within the first three years			
Language	CAES1000 Core University English (offered in both semesters)		CAES9821 Professional and Technical Communication for Mathematical Sciences (offered in both semesters)	

Flow Chart of Disciplinary Courses for BSc Major in Statistics

S1 = Offered in 1st Semester
S2 = Offered in 2nd Semester
 * 12 credits

→ Pre-requisite
 — Co-requisite



Border Scheme

Solid	Offered by SAAS
Dashed	Other Departments

Shape Scheme

Rectangle	Core
Rounded	Elective (at least 6 credits from List A*)

Color Scheme

Pink	Year 1
Yellow	Year 1 or 2
Green	Year 2
Purple	Year 2 or 3
Brown	Year 3 or above

Capstone:
 STAT3799
 STAT4710
 STAT4766
 STAT4799*

<https://www.saasweb.hku.hk/current/stat.php>

4 Core advanced level courses (24 credits)

Also core to Decision Analytics Major

STAT3600

Linear statistical analysis

STAT4601

Time-series analysis

Also core to Risk Management Major

STAT3603

Stochastic processes

STAT4602

Multivariate data analysis

Other advanced level courses (24 credits = 4 courses)

- At least one course from *List A*:

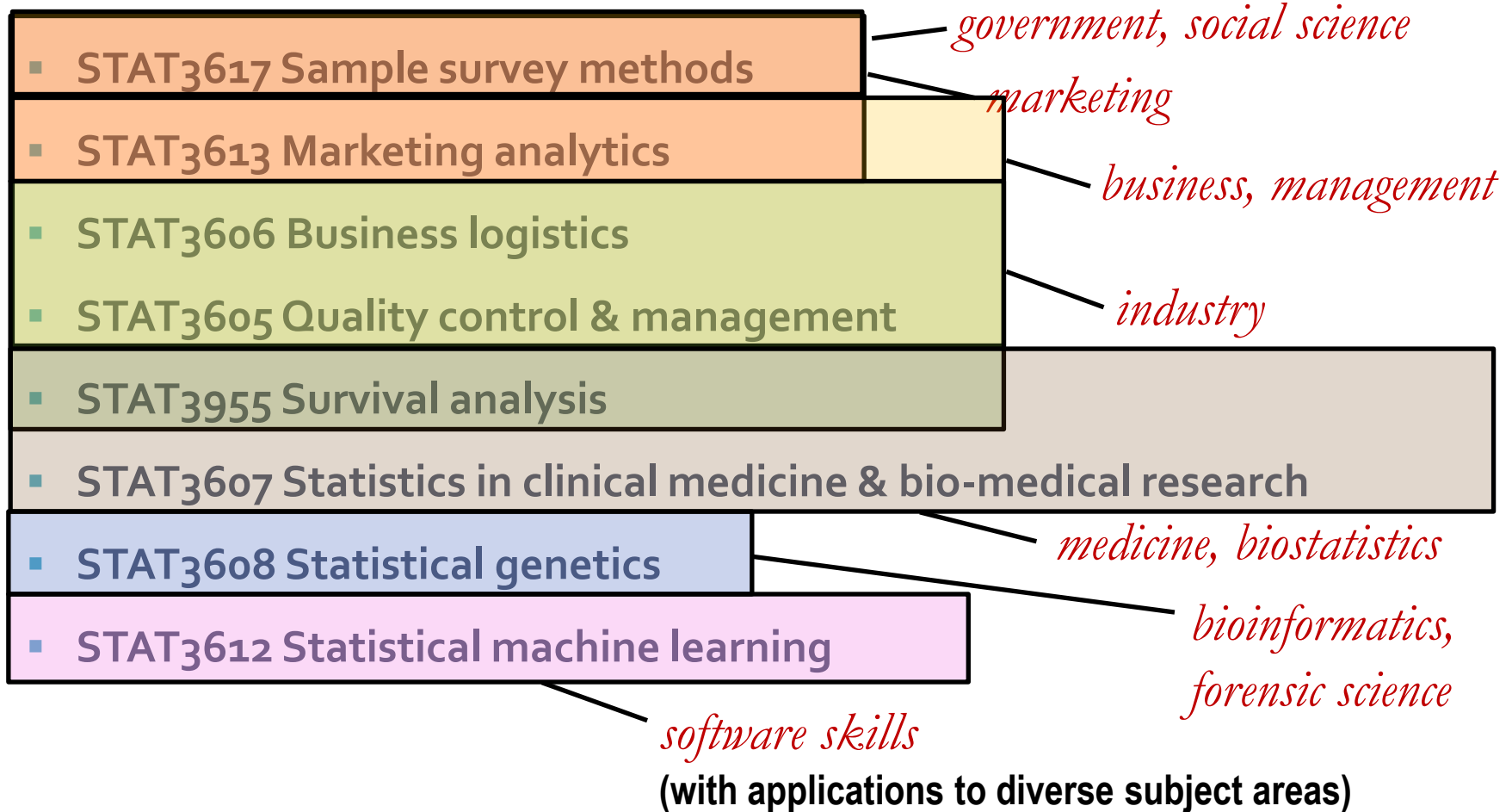
- STAT3602 Statistical inference
- STAT3604 Design and analysis of experiments
- STAT3620 Modern nonparametric statistics
- STAT3621 Statistical data analysis

mainstream statistics courses

- *core knowledge in statistics*
- *applications to general problems in all areas*
- *foundation for graduate studies in statistics or related subjects*

Other advanced level courses (24 credits = 4 courses)

■ Other courses from *List B*:



Other advanced level courses (24 credits = 4 courses)

■ Other courses from *List B*:

- STAT3617 Sample survey methods
- STAT3613 Marketing analytics
- STAT3606 Business logistics
- STAT3605 Quality control & management

*conceptually less
demanding*

- STAT3955 Survival analysis
- STAT3607 Statistics in clinical medicine & bio-medical research
- STAT3608 Statistical genetics
- STAT3612 Statistical machine learning

conceptually more demanding

Other advanced level courses (24 credits = 4 courses)

■ Other courses from *List B*:

- STAT3617 Sample survey methods
- STAT3613 Marketing analytics
- STAT3606 Business logistics
- STAT3605 Quality control & management
- STAT3955 Survival analysis
- STAT3607 Statistics in clinical medicine & bio-medical research
- STAT3608 Statistical genetics
- STAT3612 Statistical machine learning

*Theme of
data science*

Capstone requirement (6 credits)

At least 6 credits from:

individual project

- STAT3799 Directed studies in statistics (6 credits)
- STAT4799 Statistics project (12 credits)

- STAT4710 Capstone experience for statistics undergraduates (6 credits)

- STAT4766 Statistics internship (6 credits)

group project

Major in Risk Management vs Major in Statistics

- All 7 introductory level courses SAME
- Advanced level core courses:
 - 2 SAME, 2 DIFFERENT
- **Risk Management** –
 - courses focus primarily on business-related topics: e.g. *investment, insurance, finance, banking, etc.*
- **Statistics** –
 - courses cover wide range of topics with emphasis on *"METHODS", their applications,* and *underlying theory.*
- Students CANNOT double major or major/minor in **Statistics & Risk Management**

Major in Decision Analytics

Bachelor of Science

(4-year Curriculum)

What is **DECISION ANALYTICS** about?

Big Data



Data Mining / Statistical Learning / Machine Learning



Decision-making

Applications

- **Marketing**
 - *e.g. customer preference / behaviour / loyalty*
- **Finance**
 - *e.g. customer banking, stock volatility analysis, relationships between financial indicators*
- **Forensic Accounting**
 - *e.g. fraud detection in credit card transactions / insurance claims, tax evasion, insider-trading operations*
- **Healthcare**
 - *e.g. risk factors, treatment effectiveness, medical planning*
- **Biology**
 - *e.g. biological function via gene expression, protein structure identification / prediction*
- plus many others...

Netflix movie-rating challenge

Movie-rental company

17,770 movies

480,189 customers

	Dirty Dancing	Meet the Parents	Top Gun	The Sixth Sense	Catch Me If You Can	The Royal Tenenbaums	Con Air	Big Fish	The Matrix	A Few Good Men
Customer 1	•	•	•	•	4	•	•	•	•	•
Customer 2	•	•	3	•	•	•	3	•	•	3
Customer 3	•	2	•	4	•	•	•	•	2	•
Customer 4	3	•	•	•	•	•	•	•	•	•
Customer 5	5	5	•	•	4	•	•	•	•	•
Customer 6	•	•	•	•	•	2	4	•	•	•
Customer 7	•	•	5	•	•	•	•	3	•	•
Customer 8	•	•	•	•	•	2	•	•	•	3

How to predict missing ratings of customers?

Leaderboard

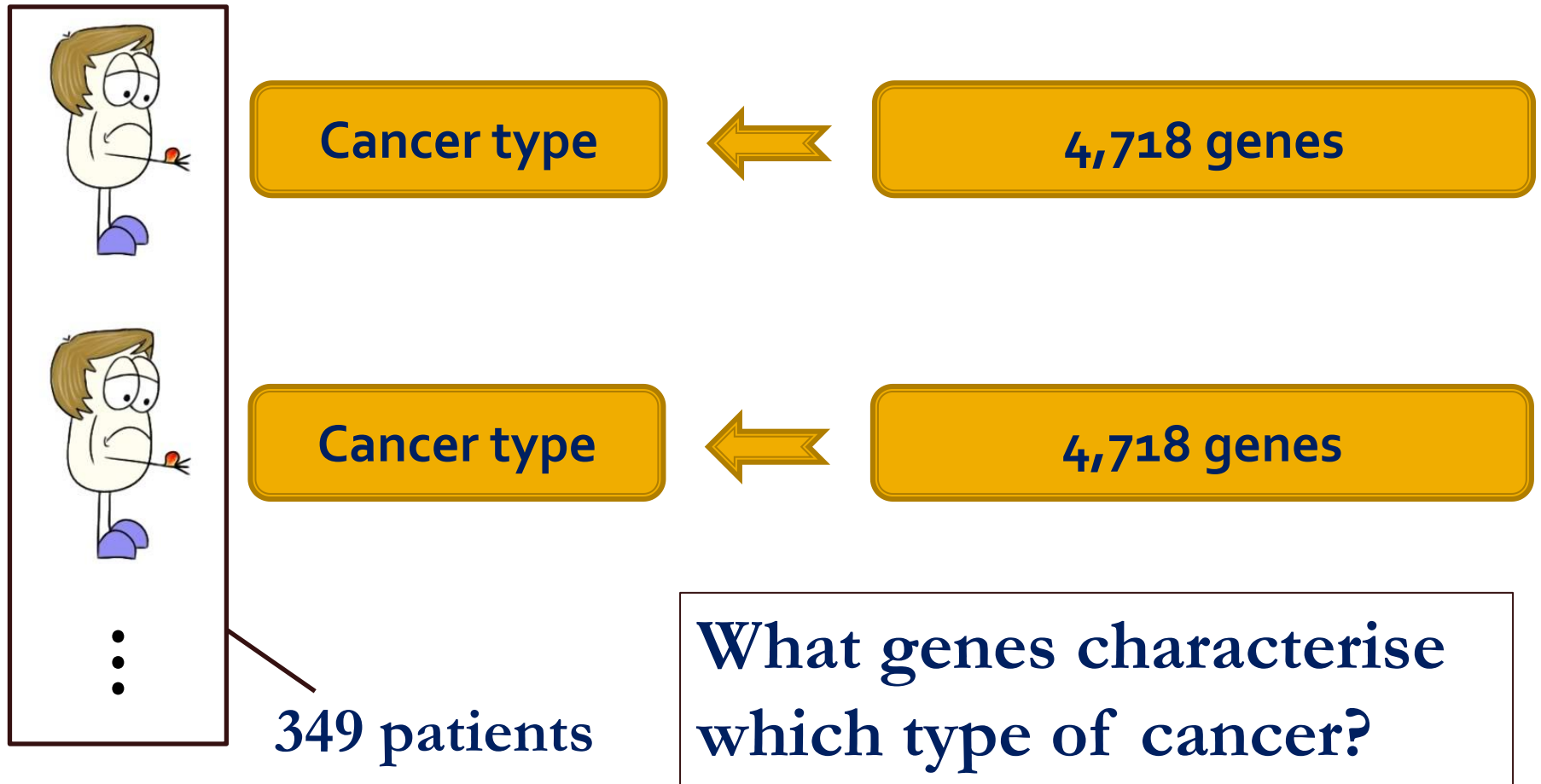
Showing Test Score. [Click here to show quiz score](#)

Display top leaders.

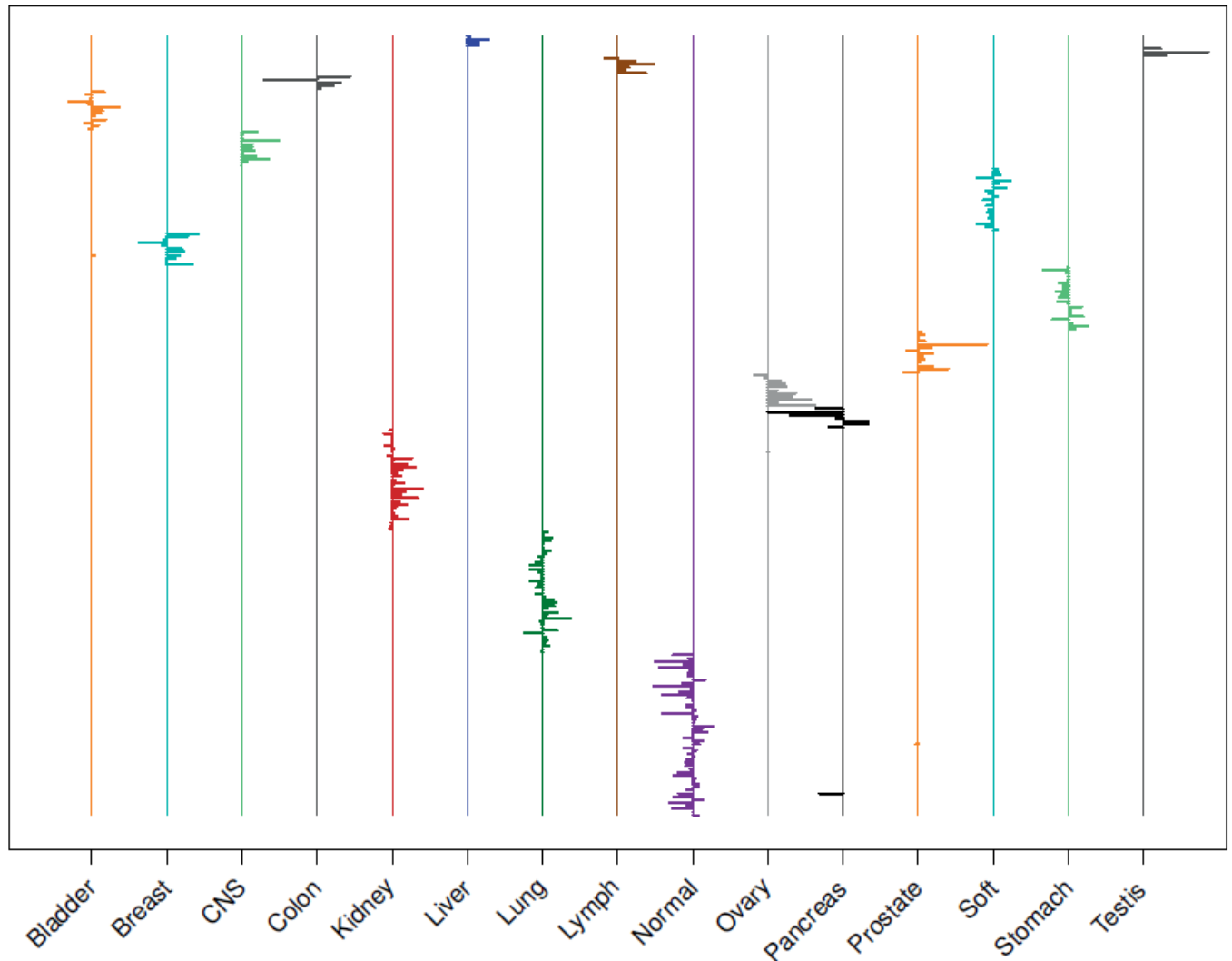
... involved many statistical techniques, of which most important is SVD (Singular Value Decomposition)

Rank	Team Name	Best Test Score	% Improvement	Best Submit Time
Grand Prize - RMSE = 0.8567 - Winning Team: BellKor's Pragmatic Chaos				
1	BellKor's Pragmatic Chaos	0.8567	10.06	2009-07-26 18:18:28
2	The Ensemble	0.8567	10.06	2009-07-26 18:38:22
3	Grand Prize Team	0.8582	9.90	2009-07-10 21:24:40
4	Opera Solutions and Vandelay United	0.8588	9.84	2009-07-10 01:12:31
5	Vandelay Industries !	0.8591	9.81	2009-07-10 00:32:20
6	Pragmatic Theory	0.8594	9.77	2009-06-24 12:06:56
7	BellKor in BigChaos	0.8601	9.70	2009-05-13 08:14:09
8	Dace	0.8612	9.59	2009-07-24 17:18:43
9	Feeds2	0.8622	9.48	2009-07-12 13:11:51
10	BigChaos	0.8623	9.47	2009-04-07 12:33:59
11	Opera Solutions	0.8623	9.47	2009-07-24 00:34:07
12	BellKor	0.8624	9.46	2009-07-26 17:19:11

Gene expression cancer data



Using lasso-regularised multinomial classifier...



Major in Decision Analytics

Bachelor of Science

(4-year Curriculum)

Structure of curriculum...

8 introductory level courses (48 credits)

- SCNC1111 Scientific method & reasoning
- SCNC1112 Fundamentals of modern science
- *MATH1013 University mathematics II
- *MATH2014 Multivariable calculus & linear algebra
- *COMP1117 Computer programming
- *COMP2119 Introduction to data structures and algorithms
- ***STAT2601 Probability and statistics I**
- ***STAT2602 Probability and statistics II**

** replaced by other advanced level STAT course(s) if already taken to fulfill other majors/minors*

Remarks:

- Students must have level 2 or above in ***HKDSE Extended Module 1 or 2 of Mathematics*** or equivalent
otherwise, strongly advised to take **MATH1011 University Mathematics I** in Semester 1.
- To enrol in COMP2119, students must also take **COMP2123 Programming Technologies and Tools**

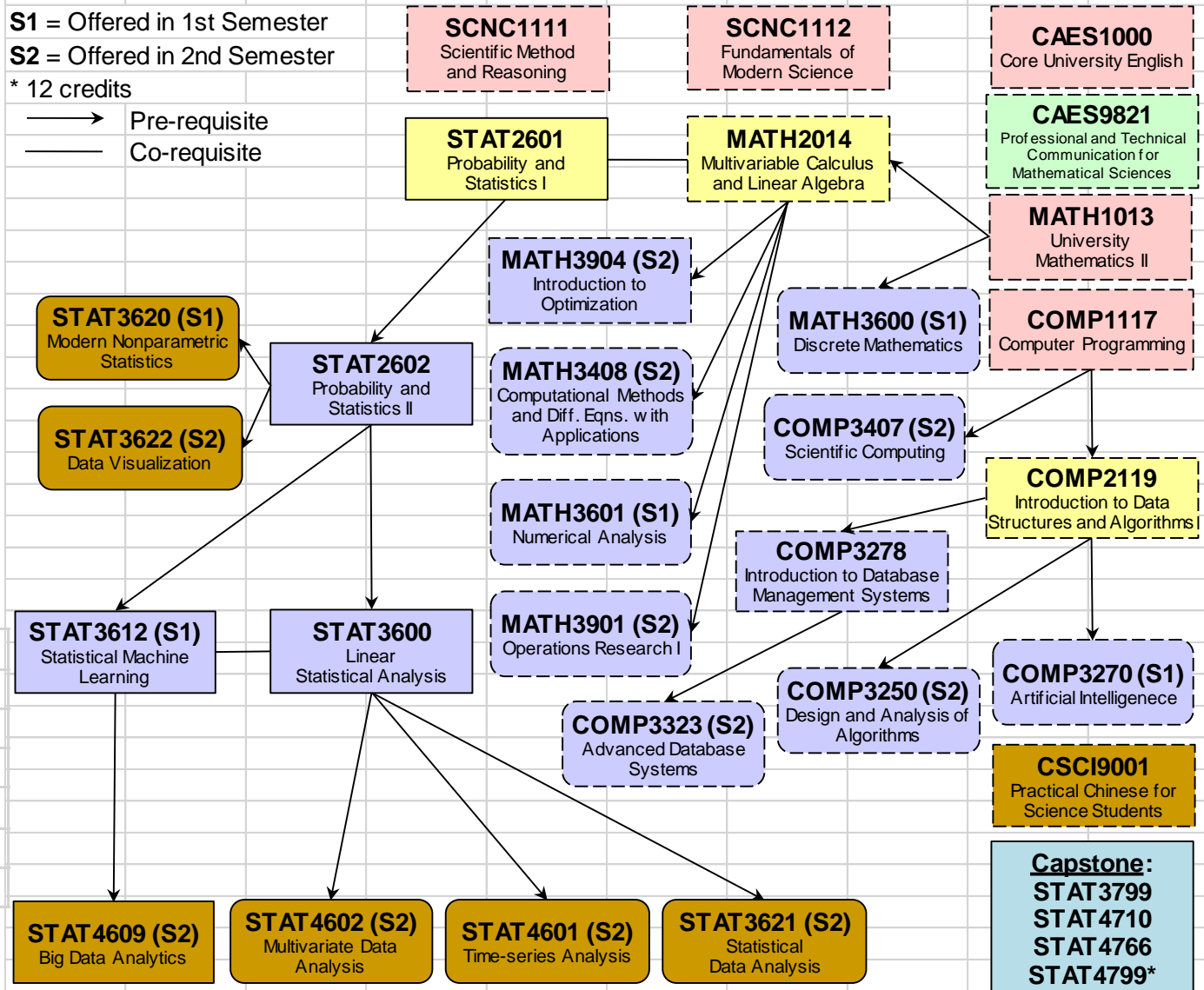
Suggested / Example Structure of BSc (Major in Decision Analytics) Curriculum

Year	One		Two	
Semester	One	Two	One	Two
Disciplinary Core	COMP1117 Computer Programming	MATH2014 Multivariable Calculus and Linear Algebra	STAT2602 Probability and Statistics II	COMP2119 Introduction to Data Structures and Algorithms
Other			COMP2123 Programming Technologies and Tools (Pre-requisite of COMP2119)	
Science Foundation Courses	SCNC1111 Scientific Method and Reasoning	SCNC1112 Fundamentals of Modern Science		
Common Core	Six common core courses within the first three years			
Language	CAES1000 Core University English (offered in both semesters)		CAES9821 Professional & Technical Communication for Mathematical Sciences (offered in both semesters)	

Flow Chart of Disciplinary Courses for BSc Major in Decision Analytics

S1 = Offered in 1st Semester
S2 = Offered in 2nd Semester
 * 12 credits

→ Pre-requisite
 — Co-requisite



Border Scheme	
Solid	Offered by SAAS
Dashed	Other Departments
Shape Scheme	
Rectangle	Core
Rounded	Elective

Color Scheme	
Pink	Year 1
Yellow	Year 1 or 2
Green	Year 2
Purple	Year 2 or 3
Brown	Year 3 or above

<https://www.saasweb.hku.hk/current/stat.php>

5 Core advanced level courses (30 credits)

STAT3600 **Linear statistical analysis**

also core to *Statistics / Risk Management Major*

STAT3612 **Statistical machine learning**

STAT4609 **Big data analytics**

COMP3278 **Introduction to database management systems**

MATH3904 **Introduction to optimization**

Elective advanced level courses (12 credits = 2 courses)

- COMP3250 Design & analysis of algorithms
- COMP3270 Artificial intelligence
- COMP3323 Advanced database systems
- COMP3407 Scientific computing
- MATH3408 Computational methods & differential equations with applications
- MATH3600 Discrete mathematics
- MATH3601 Numerical analysis
- MATH3901 Operations research I

Elective advanced level courses (12 credits = 2 courses)

- **STAT3620 Modern nonparametric statistics**
- **STAT3621 Statistical data analysis**
- **STAT3622 Data visualization**
- **STAT4601 Time-series analysis**
- **STAT4602 Multivariate data analysis**

Capstone requirement (6 credits)

At least 6 credits from:

individual project

- STAT3799 Directed studies in statistics (6 credits)
- STAT4799 Statistics project (12 credits)

- STAT4710 Capstone experience for statistics undergraduates (6 credits)

- STAT4766 Statistics internship (6 credits)

group project

Major in Decision Analytics vs Major in Statistics / Risk Management

- 8 introductory level courses (1 more than STAT/RM)
 - **COMP1117 Computer programming**
 - **COMP2119 Introduction to data structures & algorithms**
(instead of STAT1600 Statistics: ideas and concepts)
- 5 Advanced level core courses (1 more than STAT/RM):
 - **one common to all 3 majors: STAT3600 Linear statistical analysis**
- Heavier emphasis on
COMPUTER SCIENCE + MATHEMATICS
- Students **CANNOT** double major in **Decision Analytics** and
Statistics, Risk Management, Computing & Data Analytics, Computer Science
- Students **CANNOT** major in **Decision Analytics** and minor in
Statistics, Computer Science

A new introductory-level course

■ STAT2604

Introduction to R programming and elementary data analysis

- introduction to statistical programming language R
- basic programming skills in R with examples and applications in elementary statistical analysis
- management of different data types: input/output, manipulation, transformation
- random sampling, descriptive data analysis
- production of professional summary reports with high-quality graphs

Reminder

- plan ahead
- watch out for pre-requisites of individual courses
- courses **CANNOT** be double-counted to fulfill different majors/minors

(exception for double major in Science:

SCNC1111 & SCNC1112 & up to 12 credits of compulsory courses

REQUIRED by both Science majors can be double-counted)

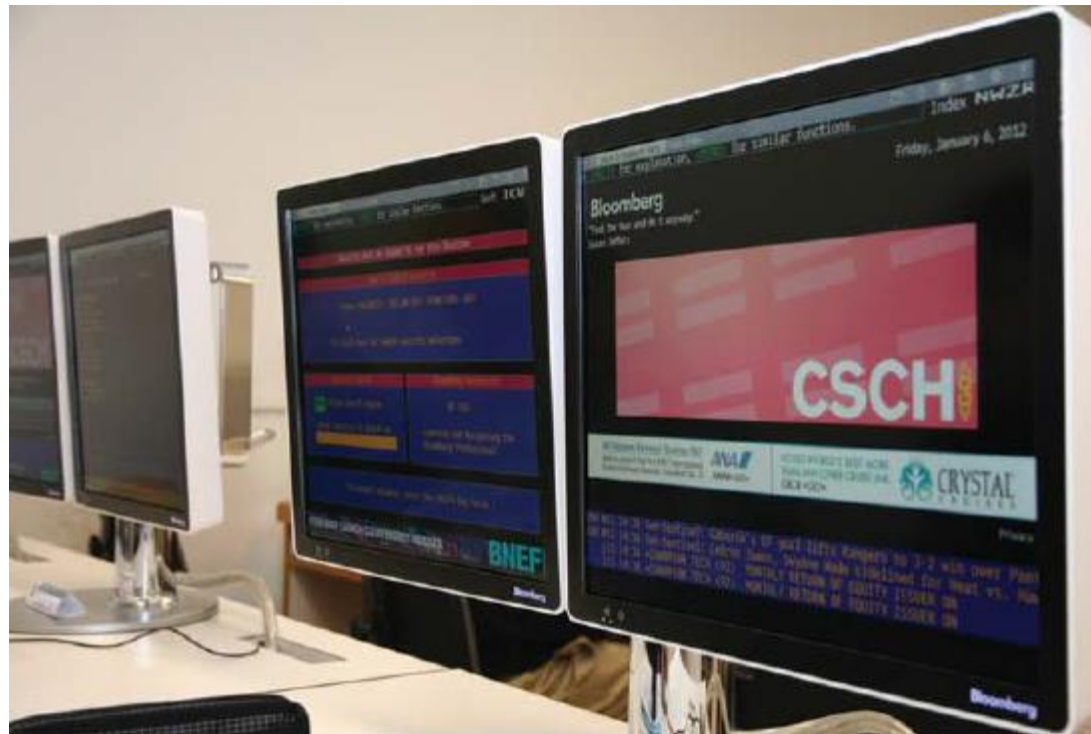
- consult course selection advisors if necessary

Contact Persons

- Co-ordinators
 - Stephen Lee (*Statistics*)
 - Guodong Li (*Decision Analytics*)
- Course Selection Advisors
 - C W Kwan
 - Stephen M S Lee
 - K Zhu
- Tel: 3917 2466
- Email: ug_enquiry@saas.hku.hk

Support from University and Department

- **Department** : Computing facilities
 - two statistical computer laboratories
 - up-to-date software for teaching, learning, research



Support from University and Department

- **HKU** : Centre of Development and Resources for Students
 - NETmatch, NETjobs, JIIS (Joint Institutions Job Info. System)
- **Department** : Internship / Job Online Application System

Contact person:
Dr C W KWAN
<cwkw@hku.hk>

The screenshot shows a web browser window with the URL <https://apps.saas.hku.hk/internship/index.php>. The page header includes the Department of Statistics & Actuarial Science logo and a group photo of students. The main content area displays user profile information:

- UID: 2008000001
- Name: Ugrad Test_Student1
- Last Status: Available working period: From: 2019-04-10 To: 2019-11-30
- Major: Statistics
- E-mail: @hku.hk
- Contact Phone: +852 12345678
- PPP Score: Letter & CV Submitted: 0.0, Case Analysis & Presentation: 0.0, Mock Interview: 0.0

Below the profile information, there are tabs for "Current Job List", "Application History", and "Past InternshipJobs". The "Current Job List" tab is active, showing a table of job records:

Jobtype	Company Name	Job Title / Job Description / Form	Closing date	Action
Full-time_ST&AS	EFA	Portfolio Investment Analyst(ASAP)(GRAD/Internship)IR 1452	2019-08-11	Submit completed application via email at careers@efadrin.com
Internship_AS&ST	AIA Group	Actuarial Internship Programme (Jan-Jun 2020)AW 1526	2019-08-31	Submit completed application via email at Rachel-yh.chan@aia.com
Internship_AS&ST	Blue, trade name of Aviva Life Insurance Co Ltd	Actuarial Intern (Jan-Jun 2020)MY 1529	2019-08-31	Submit completed application via email at careers@blue.com.hk
Full-time_AS&ST	CIGNA	Contract Associate Valuation (IFRS)(ASAP)JC 1629	2019-08-25	Submit completed application via email at sandy.lau@cigna.com
Full-time_AS&ST	YF Life Insurance International Ltd	Actuarial Analyst (GRAD)ASAP)VL 1643	2019-08-18	Submit completed application via email at recruit@yflife.com

Career Development Training

- **Summer IT course:**
 - Essential IT skills (certificate course)
- **Career Advising Programme (CAP) to prepare students for:**
 - internships and job opportunities
 - advancing resume and interview skills



香港特別行政區政府
政府統計處

Exchange study

Faculty of Science
Course Equivalence Database
(for credit transfer reference):

Contact person:
Dr ZHU Ke
<mazhuke@hku.hk>

https://webapp.science.hku.hk/student/servlet/course_equiv

COURSE EQUIVALENCE DATABASE

University

19. Canada - University of Waterloo

Canada - University of Waterloo

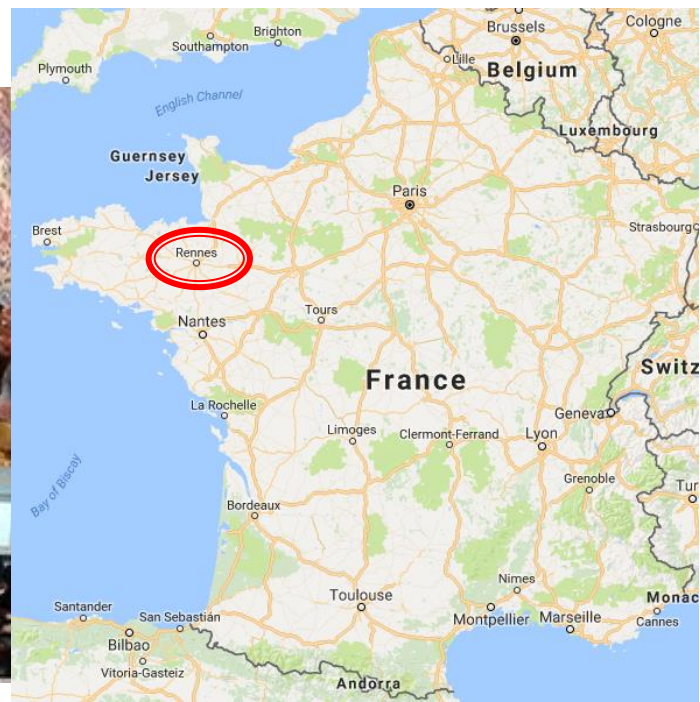
No.	Partner Code	Partner Credit/Unit	Partner Title	HKU Code	HKU Credit	HKU Title
1.	ACTSC 231	0.5	Introductory Financial Mathematics	STAT3615	6	Practical mathematics for investment
2.	ACTSC 331	0.5	Life Contingencies 2	STAT3909	6	Advanced life contingencies
3.	ACTSC 371	0.5	Introduction to Investments	STAT3609	6	The statistics of investment risk
4.	ACTSC 372	0.5	Corporate Finance	STAT3904	6	Corporate finance for actuarial science
5.	ACTSC 432	0.5	Loss Models 2	STAT3908	6	Credibility theory and loss distributions
6.	ACTSC 433	0.5	Analysis of Survival Data	STAT3955	6	Survival analysis
7.	ACTSC 445	0.5	Quantitative Enterprise Risk Management	STAT4608	6	Market risk analysis
8.	ACTSC 446	0.5	Mathematical Models in Finance	STAT3911	6	Financial economics II
9.	ACTSC 453	0.5	Basic Pension Mathematics	STAT3956	6	Pension funds and pension mathematics
10.	ACTSC 462	0.5	Introduction to Property and Casualty Pricing	STAT3954	6	Current topics in actuarial science
11.	ACTSC 463	0.5	Introduction to Property and Casualty Loss Reserving	STAT4903	6	Actuarial techniques for general insurance

Scholarships

- Available to students majoring in **Decision Analytics / Statistics / Risk Management** based on academic performance and/or other qualities

ENSAI

- ☺ Faculty-sponsored 2-week overseas study exchange tour to France
- ☺ National School for Statistics and Data Analysis
 - Rennes, France
- ☺ Ecole nationale de la statistique et de l'analyse de l'information (ENSAI in French)



Student Peer Advisers in 2019-20

- General roles
 - to **offer advice** in relation to academic studies to freshmen; and
 - to **facilitate** freshmen's **smooth transition** from secondary to university education
- Matching between **Student Peer Advisers (SPAs)** and freshmen starting from 2019-20
- You are highly encouraged to contact the following SPAs if you have any questions about your study (their contacts can be found at the Faculty's website)

Statistics

Miss CHENG Yujia (Jolin) (BSc Year 4)

Miss DING Ding (Ella) (BSc Year 3)

Mr GAN Dailin (David) (BSc Year 3)

Miss LI Tingting (TT) (BSc Year 4)

Miss ZHOU Tian-yi (Ada) (BSc Year 4)



Student Peer Advisers in 2019-20

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Decision Analytics

Mr GOPALAKRISHNAN Amruthraghav

(Amruth) (BSc Year 3)

Mr KEMEL Nurdaulet (BSc Year 2)


Mr LEE Chun Yin (Jeffrey) (BSc Year 3)

Mr MAK Sio Teng (Vincent) (BSc Year 3)

Mr MAK Tsz Hang (Henry) (BSc Year 3)

Miss TSOI Jackie Chung Wing (BSc Year 3)

Miss ZHAO Xiaofan (Lauren) (BSc Year 2)



**Let's talk to
our SPAs!**

Q & A