BNU-HKBU

UNITED INTERNATIONAL COLLEGE

UNDERGRADUATE HANDBOOK

2017-2018

Division of Science and Technology

Statistics Programme

Contents

1. Introduction

This student handbook provides some general information about the **Statistics Programme** in the Division of Science and Technology, BNU-HKBU United International College. Students can also find specific information about the programme curriculum, structure, degree requirements, etc. in this handbook. Students should read this handbook carefully and discuss any queries with their mentors, teachers, Programme Director, or the Division Dean. The contents of this handbook are for reference only, and are subject to change without notice.

2. The Division of Science and Technology

The primary academic objective of the Division is to provide students with a number of four-year Honours Degree Programmes. Seven major programmes are currently offered:

Programme	Degree[①]	Years of Study
Applied Psychology 應用心理學	BSc (Hons) (i) 理學士（榮譽）	4
Computer Science and Technology 計算機科學與技術	BSc (Hons) (ii) 理學士（榮譽）	4
Data Science 數據科學	BSc (Hons) (iii) 理學士（榮譽）	4
Environmental Science 環境科學	BSc (Hons) (iv) 理學士（榮譽）	4
Financial Mathematics 金融數學	BSc(Hons) (v) 理學士（榮譽）	4
Food Science and Technology 食品科學與工程	BSc (Hons) (vi) 理學士（榮譽）	4
Statistics 統計學	BSc (Hons) (vii) 理學士（榮譽）	4

3. The Statistics Programme

The Statistics Programme at UIC is committed to quality, leading-edge education, and research. It offers the Bachelor of Science (Honours) in Statistics.

3.1. Teaching Methods and Medium of Instruction

Teaching will be mainly by formal lectures. Tutorials and laboratory sessions will also be organised to complement formal lectures. The most up-to-date IT tools to aid teaching and learning will be used. English is the medium of instruction for lectures, tutorials and laboratory classes.

[①] The following degrees will be awarded by the Hong Kong Baptist University: (i) Bachelor of Science (Honours) in Applied Psychology 應用心理學理學士（榮譽）; (ii) Bachelor of Science (Honours) in Computer Science and Technology 計算機科學與技術理學士（榮譽）; (iii) Bachelor of Science (Honours) in Data Science 數據科學理學士（榮譽）; (iv) Bachelor of Science (Honours) in Environmental Science 環境科學理學士（榮譽）; (v) Bachelor of Science (Honours) in Financial Mathematics 金融數學理學士（榮譽）; (vi) Bachelor of Science (Honours) in Food Science and Technology 食品科學與工程理學士（榮譽）; (vii) Bachelor of Science (Honours) in Statistics 統計學理學士（榮譽）.

3.2. Programme Aims, Objectives and Learning Outcomes

Aims and Objectives

To provide students with an education that prepares them for careers as practicing statisticians and operations research practitioners. This Programme is designed to

(1) Provide students with a broad and yet deep education in mathematics, statistics and operations research, so as to enable them in applying their knowledge to various related professions, with special emphasis in industrial and commercial areas.
(2) Well train students in the use of various computer and statistical software to solve real-life problems.
(3) Enable students to pursue their postgraduate research studies successfully in related fields.

Programme Intended Learning Outcomes - PILOs

Upon successful completion of the Programme, students will be able to:

PILO 1: Evaluate the principles, concepts and theories of statistics, operations research and actuarial science;
PILO 2: Independently analyse real world/professional problems and develop the critical solutions, underpinned by academic and professional knowledge;
PILO 3: Proficiently use statistical and mathematical software to solve a range of problems in scientific, engineering, commercial and other practical applications;
PILO 4: Quantitatively compare with alternative approaches and develop mathematical and statistical models, in order to enhance the performance and reliability of such models; and
PILO 5: Communicate and practice effectively as a professional both in team and independent working context.

The above PILOs are in alignment with HKBU's Graduate Attributes (GAs):

GA 1: **Citizenship**: Be a responsible citizen with an international outlook and a sense of ethics and civility;
GA 2: **Knowledge**: Have up-to-date, in-depth knowledge of an academic specialty, as well as a broad range of general knowledge;
GA 3: **Learning**: Be an independent, lifelong learner with an open mind and an inquiring spirit;
GA 4: **Skills**: Have the necessary information literacy and IT skills, as well as numerical and problem-solving skills, to function effectively in work and everyday life;
GA 5: **Creativity**: Be able to think critically and creatively;
GA 6: **Communication**: Have trilingual and biliterate competence in Chinese and English, and the ability to articulate ideas clearly and coherently;
GA 7: **Teamwork**: Be ready to serve, lead and work in a team, and to pursue a healthy lifestyle.

Table 1. The OBTL GAs – PILOs Mapping Matrix

GAs / **PILOs**	Citizen-ship	Know-ledge	Learn-ing	Skills	Creati-vity	Communi-cation	Team-work	**No. of GAs addressed by this PILO**
PILO 1		X				X		**2**
PILO 2		X	X	X				**3**
PILO 3		X	X	X				**3**

GAs / PILOs	Citizen-ship	Know-ledge	Learn-ing	Skills	Creati-vity	Communi-cation	Team-work	**No. of GAs addressed by this PILO**
PILO 4			X	X	X			**3**
PILO 5						X	X	**2**
No. of PILOs addressing this GA	**0**[#]	**3**	**3**	**3**	**1**	**2**	**1**	**---**

[#] *Students will achieve "Citizenship" by some GE Courses and WPEX Modules, e.g. Chinese History and Civilisation, Applied Ethics and so on.*

4. Teaching Staff

Full-time teaching staff are recruited from all over the world. All teachers recruited must possess a Ph.D. and have relevant research experience. Experts or specialists with exceptional skills and experience in the fields of Biostatistics, Actuarial Science and Computer Science and Technology, etc., are also recruited.

5. Programme Structure

The Bachelor of Science (Honours) in Statistics is a four-year full-time undergraduate programme. In addition to the major courses, students are required to take supporting, interdisciplinary, General Education (GE) Courses and the Whole Person Education Experiential Learning Modules (WPEX) of their own choice. In the final year of study, students take individual final year projects in which they gain in-depth knowledge, basic research techniques, and training in thesis writing.

Students are normally expected to complete 132 units within the curriculum structure below:

Course Category	Units
Major Required Courses (专业必修课)	42
Major Elective Courses (专业选修课)	18
General Education Core Courses (通识教育核心课)	32
General Education Distribution Courses (通识教育分类选修课)	12
Whole Person Education Experiential Learning Modules (全人教育体验学习课程)	4
Free Elective Courses (自由选修课)	24
Total	**132**

5.1. Major Required Courses

Code	English Title	Chinese Title	Units
MATH1053	Linear Algebra I	线性代数 I	3
MATH1063	Linear Algebra II	线性代数 II	3
MATH1073	Calculus I	微积分 I	3
MATH1083	Calculus II	微积分 II	3

Code	English Title	Chinese Title	Units
OR3013	Linear Programming and Integer Programming	线性规划和整数规划	3
OR3023	Simulation	随机模拟	3
OR4023	Optimization	最优化方法	3
STAT2003	Advanced Statistics	高等统计学	3
STAT2013	Regression Analysis	回归分析	3
STAT2043	Structured Programming (for STAT Students)	结构化程序设计	3
STAT4004	Final Year Project I (STAT)	毕业论文 I	3
STAT4013	Multivariate Analysis	多元统计分析	3
STAT4043	Categorical Data Analysis	属性数据分析	3
STAT4063	Time Series Analysis	时间序列分析	3
---	**Total**	**合计**	**42**

5.2. Major Elective Courses

Students are required to select 6 courses (18 units) from the list below. However, they are encouraged to choose more major elective courses as free electives based on their interests and plans for future development. For example, they should choose some actuarial science courses if they would like to pursue further study or a career in Actuarial Science.

Code	English Title	Chinese Title	Units
DS4033	Text Mining and Analytics	文本挖掘与分析	3
DS4043	Introduction to Statistical Computing	统计计算	3
DS4053	Introduction to Bioinformatics	生物信息学	3
MATH2013	Introduction to Mathematical Finance*	金融数学导论	3
MATH4003	Graph Theory	图论	3
MATH4013	Real Analysis	实变分析	3
MATH4023	Differential Equation	微分方程	3
MATH4033	Computational Finance*	金融计算	3
MATH4043	Actuarial Mathematics*	精算数学	3
MATH4053	Numerical Methods	计算方法	3
MATH4063	Case Studies in Mathematical Modelling	数学建模案例分析	3
OR3003	Logistics	物流学	3
OR4003	Dynamic Programming Inventory Control	动态规划及库存控制	3
OR4013	Advanced Topics in Operations Research	高等运筹学选题	3
OR4033	Network and Transportation Models	网络及运输模型	3
STAT3003	Survey Sampling	抽样调查	3
STAT3013	Life Contingencies*	人寿偶然性	3
STAT3023	Quality Control - Six Sigma	质量控制-六西格码	3
STAT3033	Bayesian Statistics	贝叶斯统计	3
STAT3043	Data Analysis Using R	R 语言统计分析	3
STAT4003	Experimental Design	试验设计	3
STAT4005	Final Year Project II (STAT)#	毕业论文 II	3

Code	English Title	Chinese Title	Units
STAT4023	Loss Models*	损失模型	3
STAT4033	Structural Equation Modelling	结构方程建模	3
STAT4053	Survival Analysis	生存分析	3
STAT4073	Data Mining	数据挖掘	3
STAT4093	Applied Stochastic Process	应用随机过程	3
STAT4103	Introduction to Deep Learning with Python	深度学习导论:基于 Python	3

** Actuarial science course.*

 # Students who continue with the final year project in the second semester of Year 4 should, with the approval of the Program Director, register Final Year Project II (STAT) as a major elective in that semester.

The availability of major elective courses each semester is subject to minor changes and adjustments depending on staff availability.

5.3. General Education Programme

All students should complete 48 units of General Education (GE) Courses to fulfil the graduation requirements. The GE Programme consists of (a) 32 units of GE Core (GEC) Courses, (b) 12 units of GE Distribution (GED) Courses, and (c) 4 units of Whole Person Education Experiential Learning Modules (WPEX). Please see Appendix I for detailed information about the GE Programme.

5.4. Free Elective Courses

The 24 units of Free Electives could be used by students to (a) spend a semester abroad; (b) take a minor or (c) take more courses offered by Divisions and teaching units.

5.5. The Mapping Matrix of Major Courses with PILOs

Each course offered by the Statistics Programme either required or elective courses are designed to meet certain PILOs as listed in Table 2.

Table2. The OBTL PILOs – Courses Mapping Matrix

PILOs / Courses	PILO 1	PILO 2	PILO 3	PILO 4	PILO 5
Major Required Courses					
MATH1053 Linear Algebra I	X	X			
MATH1063 Linear Algebra II	X	X			
MATH1073 Calculus I	X	X			
MATH1083 Calculus II	X	X			
OR3013 Linear Programming and Integer Programming	X	X	X		
OR3023 Simulation		X	X	X	
OR4023 Optimization		X	X	X	
STAT2003 Advanced Statistics	X	X	X		
STAT2013 Regression Analysis	X	X	X		
STAT2043 Structured Programming (for STAT Students)	X	X	X		

PILOs / Courses	PILO 1	PILO 2	PILO 3	PILO 4	PILO 5
STAT4004 Final Year Project I (STAT)		X	X	X	
STAT4013 Multivariate Analysis		X	X	X	
STAT4043 Categorical Data Analysis		X	X		X
STAT4063 Time Series Analysis		X	X	X	
Major Elective Courses					
DS4033 Text Mining and Analytics	X	X			X
DS4043 Introduction to Statistical Computing		X	X		X
DS4053 Introduction to Bioinformatics	X		X		X
MATH2013 Introduction to Mathematical Finance	X	X	X		
MATH4003 Graph Theory		X	X	X	
MATH4013 Real Analysis	X	X			
MATH4023 Differential Equation		X	X		
MATH4033 Computational Finance		X	X	X	
MATH4043 Actuarial Mathematics	X	X		X	
MATH4053 Numerical Methods	X	X	X		
MATH4063 Case Studies in Mathematical Modelling			X	X	X
OR3003 Logistics		X	X	X	
OR4003 Dynamic Programming Inventory Control		X	X	X	
OR4013 Advanced Topics in Operations Research		X	X	X	
OR4033 Network and Transportation Models		X	X	X	
STAT3003 Survey Sampling		X	X		X
STAT3013 Life Contingencies		X	X	X	
STAT3023 Quality Control - Six Sigma	X	X	X		
STAT3033 Bayesian Statistics		X	X	X	
STAT3043 Data Analysis Using R		X	X	X	X
STAT4003 Experimental Design		X	X	X	
STAT4005 Final Year Project II (STAT)		X	X	X	
STAT4023 Loss Models	X	X		X	
STAT4033 Structural Equation Modelling		X	X	X	
STAT4053 Survival Analysis		X		X	X
STAT4073 Data Mining		X	X		X
STAT4093 Applied Stochastic Process		X	X	X	
STAT4103 Introduction to Deep Learning with Python	X	X	X	X	X

6. Four-Year Study Plan

6.1. Year One

Semester 1	Unit(s)	Semester 2	Unit(s)
GCLA1903 English I 大学英文 I	3	GCLA1913 English II 大学英文 II	3
GCCH1003 University Chinese 大学国文	3	GCCH1013 Chinese Thought Through the Ages 中国社会思潮	3

Semester 1	Unit(s)	Semester 2	Unit(s)
Numeracy* 数理思维	3	MATH1073 Calculus I 微积分 I	3
Foundation Course in a Foreign Language* 外语基础课	3	MATH1053 Linear Algebra I 线性代数 I	3
Information Management Technology* 信息管理技术	3	Foundation Course in Business and Management* 工商管理基础课	3
Physical Education* 体育	1	Physical Education* 体育	1
WPEX Module I 全人教育体验学习模块 I	1	WPEX Module II 全人教育体验学习模块 II	1
Total	**17**	**Total**	**17**

** This denotes a category in which a list of courses may be developed for students' selection. Students are expected to refer to the Online Course Selection System for courses available under each category.*

6.2. Year Two

Semester 1	Unit(s)	Semester 2	Unit(s)
GCLA1923 English III 大学英文 III	3	GCLA1933 English IV 大学英文 IV	3
GCVM1013 Applied Ethics in Science and Technology 应用伦理学（理工科技类）	3	GCCH1023 Selected Themes in Chinese History and Civilisation 中国历史与文明专题	3
MATH1083 Calculus II 微积分 II	3	STAT2003 Advanced Statistics 高等统计学	3
MATH1063 Linear Algebra II 线性代数 II	3	Free Electives 自由选修课	3
STAT2043 Structured Programming (for STAT Students) 结构化程序设计	3	OR3013 Linear Programming and Integer Programming 线性规划和整数规划	3
Foundation Course in World History and Civilisation* 世界历史与文化基础课	3	Foundation Course in Humanities and Social Sciences* 人文与社会科学基础课	3
WPEX Module III* 全人教育体验学习模块 III	1	WPEX Module IV* 全人教育体验学习模块 IV	1
Total	**19**	**Total**	**19**

** This denotes a category in which a list of courses may be developed for students' selection. Students are expected to refer to the Online Course Selection System for courses available under each category.*

6.3. Year Three

Semester 1	Unit(s)	Semester 2	Unit(s)
STAT2013 Regression Analysis 回归分析	3	OR3023 Simulation 随机模拟	3
OR4023 Optimization 最优化方法	3	STAT4013 Multivariate Analysis 多元统计分析	3
Major Electives 专业选修课	6	STAT4063 Time Series Analysis 时间序列分析	3

Semester 1	Unit(s)	Semester 2	Unit(s)
Free Electives 自由选修课	3	Major Electives 专业选修课	3
Free Electives (ENG) 自由选修课	3	Free Electives 自由选修课	6
Total	**18**	**Total**	**18**

6.4. Year Four

Semester 1	Unit(s)	Semester 2	Unit(s)
STAT4043 Categorical Data Analysis 属性数据分析	3	Major Electives 专业选修课	3
STAT4004 Final Year Project I (STAT) 毕业论文 I	3	Free Electives 自由选修课	3
Major Electives 专业选修课	6	Students may be allowed to take extra units to make up for any unit deficiencies for graduation.	---
Free Electives 自由选修课	6		
Total	**18**	**Total**	**6**

*** Students who continue with the final year project in the second semester of Year 4 should register Final Year Project II (STAT) as a major elective during the Online Course Selection (or Course Add/Drop) period as informed by the Academic Registry.*

Notes:

a. Due to actual distribution of staff resources, the final study plan may vary slightly from the version here.
b. Students are advised to consult their Programme Director for any variation of the study plan.
c. A student will be classified as full-time when registering for a minimum of 15 units per semester. However, in order to facilitate students' job hunting in the second semester of Year 4, some courses of that semester may be taught in earlier semesters. Under such circumstances, Year-4 students with a study load of less than 15 units are also classified as full-time.

7. Internship, Placement and Overseas Visits

In order to provide students with practical experiences and broaden their minds and horizons, UIC will try to arrange internships, placements in industries, companies and enterprises, and overseas visits for students.

8. Research Institute

In 2006, the Division of Science and Technology established a Statistics and Computational Intelligence Research Institute (for details, see the UIC website). The Director of the Institute is Prof. K. T. Fang (IMS and ASA Elected Fellow).