2018-19 Major/Minor Talk for BSc I

1. Major in Mathematics

2. Minor in Mathematics

3. Minor in Computational and Financial Mathematics

4. Minor in Operations Research & Mathematical Programming

Dr. Y.M. Chan

Department of Mathematics, HKU

2018-19 Major/Minor Talk for BSc 1

Schedule

1. Introduction and Programme Requirements

2. Our Major and Minor Programmes

3. Introductory-level Courses

4. Suggested Study Plans

5. Career Prospects and Graduate Studies

6. Course Selections Advisers and Student Peer Advisers

7. Q&A

2018-19 Major/Minor Talk for BSc I

Information for Students

List of Courses offered in 2018-19

Check our website at

http://www.math.hku.hk/

Programme Requirements

http://www.scifac.hku.hk/

Programme Requirements

Programme Requirements

UNDERGRADUATE
SYLLABUSES & REGULATIONS

FACULTY OF SCIENCE
THE UNIVERSITY OF HONG KONG

4-Year Curriculum

2018-2019

Check Course Details

Check Science Major/Minor/ Programe Structure

Check Capstone Requirements for Each Major/ Programme

Other Information:
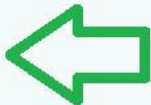
- Degree Regulations - BSc / BSc(Actuarial Science)
- University Regulations for First Degree Curricula
- Graduation Requirements and Honours Classification: BSc / BSc(Actuarial Science)
- Equivalency of HKDSE and other qualifications
- Students taking double Majors, Major-Minor or double Minors with overlapping course requirements
- Credit Unit Statement - BSc / BSc(Actuarial Science)
- Past Syllabuses and Regulations (2017-2018 or before)

Programme Requirements

2018-19 Major/Minor Talk for BSc I

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1. Major in Mathematics

About the Major:

- The **Mathematics Major** provides students with a solid and comprehensive undergraduate education in the subject.

- It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

- **Core courses** in the curriculum emphasize fundamental knowledge and concepts in Mathematics.

- **Elective courses** provide training in both pure and applied aspects of Mathematics.

1. Major in Mathematics

About the Major:

- Throughout the curriculum there is also emphasis on experiential learning through
  - ➢ guided studies
  - ➢ projects
  - ➢ seminars
  - ➢ summer internships
- With diverse variety of courses, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, logistics, management, research and further studies.

1. Major in Mathematics

Programme Requirements:

Major in Mathematics

Introductory level courses (48 credits)	
Science Foundation Courses	(12 credits)
SCNC1111	Scientific Method and Reasoning
SCNC1112	Fundamentals of Modern Science
Disciplinary Core Courses	(36 credits)
MATH1013	University Mathematics II
MATH2012	Fundamental Concepts of Mathematics
MATH2101	Linear Algebra I
MATH2102	Linear Algebra II
MATH2211	Multivariable Calculus
MATH2241	Introduction to Mathematical Analysis

1. Major in Mathematics

Programme Requirements:

Advanced level courses (42 credits)	
Disciplinary Core Course	(6 credits)
MATH3401	Analysis I
Disciplinary Electives	(36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements.

List A

MATH3301	Algebra I
MATH3403	Functions of a Complex Variable
MATH3601	Numerical Analysis
MATH3603	Probability Theory
MATH3904	Introduction to Optimization

For List B, please refer to *Syllabuses and Regulations: Major in Mathematics*

1. Major in Mathematics

Programme Requirements:

Capstone requirement (6 credits)	
At least 6 credits selected from the following courses:	
MATH3999	Directed Studies in Mathematics
MATH4910	Senior Mathematics Seminar
MATH4911	Mathematics Capstone Project
MATH4966	Mathematics Internship
MATH4999	Mathematics Project (12 credits)

1. Major in Mathematics

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science.

    The double-counted courses must include *SCNC1111 Scientific method and reasoning* (6 credits) and *SCNC1112 Fundamentals of modern science* (6 credits).

    Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

1. Major in Mathematics

Notes:

2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major.

   Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

1. Major in Mathematics

Notes:

3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.

4. Students must have **level 2 or above** in HKDSE Extended **Module 1 or 2 of Mathematics or equivalent** to take this major. Students who do not fulfill this requirement are advised to take **MATH1011 University Mathematics I**.

1. Major in Mathematics

Notes:

5. Students taking the Mathematics related major/minor should check the **exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses** at *http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req*

1. Major in Mathematics

Exemption and Replacements:

Exempted Course	Exemption granted under the following circumstances	Specified Replacement Course
MATH1013 University mathematics II	For students taking Minor with an overlap of Disciplinary Core Course : **MATH1013** --- For students taking Programme/Major/Minor with Disciplinary Core Courses : **MATH1851 and MATH1853** *(which are together deemed equivalent to MATH1013)* --- For students taking Professional Core in Bachelor of Science in Actuarial Science with Disciplinary Core Course : **MATH1821** *(which is equivalent to MATH1013)*	Select **6 credits** from the following to replace MATH1013: - MATH2012 Fundamental concepts of mathematics (6) - MATH2241 Introduction to mathematical analysis (6) - Any 6-credit advanced level Mathematics Disciplinary Elective chosen from the Programme/Major/Minor structure in which MATH1013 is the disciplinary core course

1. Major in Mathematics

Exemption and Replacements:

Exempted Course	Exemption granted under the following circumstances	Specified Replacement Course
MATH2014 Multivariable calculus and linear algebra	For students taking Professional Core in Bachelor of Science in Actuarial Science with Disciplinary Core Course : **MATH2822** *(which is equivalent to MATH2014)*	Select **6 credits** from the following to replace MATH2014: - MATH2012 Fundamental concepts of mathematics (6) - MATH2241 Introduction to mathematical analysis (6) - Any 6-credit advanced level Mathematics Disciplinary Elective chosen from the Major/Minor structure in which MATH2014 is the disciplinary core course
MATH2101 Linear algebra I	For students taking Minor with an overlap of Disciplinary Core Course : **MATH2101**	Select **6 credits** from the following to replace MATH2101: - MATH2012 Fundamental concepts of mathematics (6) - MATH2241 Introduction to mathematical analysis (6) - Any 6-credit advanced level Mathematics Disciplinary Elective chosen from the Minor structure in which MATH2101 is the disciplinary core course

1. Major in Mathematics

Exemption and Replacements:

Exempted Course	Exemption granted under the following circumstances	Specified Replacement Course
MATH2211 Multivariable calculus	For students taking Minor with an overlap of Disciplinary Core Course : **MATH2211**	Select **6 credits** from the following to replace MATH2211: - MATH2012 Fundamental concepts of mathematics (6) - MATH2241 Introduction to mathematical analysis (6) - Any 6-credit advanced level Mathematics Disciplinary Elective chosen from the Minor structure in which MATH2211 is the disciplinary core course
18 credits of Introductory level courses requirement of the Minor: MATH1013 MATH2101 MATH2211	For students taking Professional Core in Bachelor of Science in Actuarial Science with Disciplinary Core Courses : **MATH1821 and MATH2822** *(which are together deemed to have satisfied MATH1013, MATH2101 & MATH2211)*	Select **18 credits** from the following to replace the credit requirement of MATH1013, MATH2101 & MATH2211: - MATH2012 Fundamental concepts of mathematics (6) *(if not the disciplinary core course in the structure)*; and/or - MATH2241 Introduction to mathematical analysis (6) *(if not the disciplinary core course in the structure)*; and/or - Equivalent credits of advanced level Mathematics Disciplinary Elective(s) chosen from the Major/Minor structure in which MATH1013, MATH2101 & MATH2211 are the disciplinary core courses

1. Major in Mathematics

Research Group: Geometry

- Prof. W.S. Cheung (*Harvard*) Differential geometry, differential equations, and analytic inequalities

- Prof. J.H. Lu (*Berkeley*) Poisson geometry and Lie theory

- Prof. N. Mok (*Stanford*) Several complex variables, complex geometry, algebraic geometry

- Prof. T.W. Ng (*HKUST*) Geometric function theory and several complex variables

- Dr. Z. Hua (*Wisconsin*) Algebraic geometry

Research Group: Number Theory

- Prof. K.M. Tsang (*Princeton*) Number theory

- Dr. B. Kane (*Wisconsin*) Number theory, combinatorics

- Dr. Y.K. Lau (*HKU*) Number theory

- Dr. J. Liu (*Postdoctoral Fellow / Wesleyan U*) Number theory, coding theory

1. Major in Mathematics

Nobel Prize in Economics:

Out of the 47 Laureates of the past 25 years, 23 have degrees in mathematics:

2016 Bengt Holmström (BS in math and science)
2016 Oliver Hart (BA in math)
2015 Angus Deaton (Read math for two years)
2014 Jean Tirole (doctorat de troisieme cycle in decision mathematics)
2013 Lars Peter Hansen (BS in math)
2012 Alvin E. Roth (BS,MS,PhD in OR)
2012 Lloyd Shapley (BA, PhD in math)
2011 Christopher A. Sims (BA in math)
2010 Peter A. Diamond (BA in math)
2007 Eric S. Maskin (BS in math)
2005 Robert J. Aumann (BS, MS, PhD in math)
2004 Edward C. Prescott (BA in math, MS in OR)
2003 Clive W. J. Granger (BA in math)
2002 Daniel Kahneman (BA in math and psychology)
2001 Michael Spence (BA, MA in math)
2000 James J. Heckman (BA in math)
1998 Amartya Sen (BA minor in math)
1997 Robert C. Merton (BS, MS in applied math)
1996 James A. Mirrlees (MA in math)
1996 William Vickrey (BS in math)
1994 John F. Nash Jr. (PhD in math)
1994 Reinhard Selten (PhD in math)
1992 Gary S. Becker (BA in math)
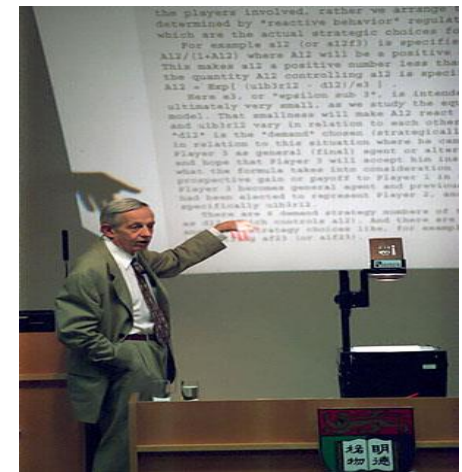
1. Major in Mathematics

Major in Mathematics
Minor in Economics/ Finance/ Risk Management

Master/PhD in Economics

Master/PhD in Finance

Master/PhD in Risk Management

2. Minor in Mathematics

About the Minor:

- The **Minor in Mathematics** provides students with fundamental knowledge in the subject.

- It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills.

- It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

2. Minor in Mathematics

Programme Requirements:

Introductory level courses (18 credits)	
Disciplinary Core Course	(6 credits)
MATH1013	University Mathematics II
Disciplinary Electives	(12 credits)
Select either List A or List B:	
List A	
MATH2101	Linear Algebra I
MATH2211	Multivariable Calculus
List B	
MATH2012	Fundamental Concepts of Mathematics
MATH2014	Multivariable Calculus and Linear Algebra
Advanced level courses (18 credits)	
Disciplinary Electives	(18 credits)
At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), subject to pre-requisite requirements.	

Please also refer to the notes and remarks in *Syllabuses and Regulations: Minor in Mathematics*

3. Minor in Computational and Financial Mathematics

About the Minor:

- The **Minor in Computational & Financial Mathematics** provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills.

- It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from **computational sciences** and **financial industry**.

3. Minor in Computational and Financial Mathematics

Programme

Requirements:

Introductory level courses (18 credits)	
Disciplinary Core Course	(6 credits)
MATH1013	University Mathematics II
Disciplinary Electives	(12 credits)
Select either List A or List B:	
List A	
MATH2101	Linear Algebra I
MATH2211	Multivariable Calculus
List B	
MATH2012	Fundamental Concepts of Mathematics
MATH2014	Multivariable Calculus and Linear Algebra
Advanced level courses (24 credits)	
Disciplinary Core Courses	(12 credits)
MATH3601	Numerical Analysis
MATH3906	Financial Calculus
Disciplinary Electives	(12 credits)
At least 12 credits selected from the following courses:	
MATH3408	Computational Methods and Differential Equations with Applications
MATH3603	Probability Theory
MATH3904	Introduction to Optimization
MATH3911	Game Theory and Strategy
MATH4602	Scientific Computing
MATH4907	Numerical Methods for Financial Calculus
MATH7217	Topics in Financial Mathematics
MATH7224	Topics in Advanced Probability Theory

Please also refer to the notes and remarks in *Syllabuses and Regulations: Minor in Computational and Financial Mathematics*

3. Minor in Computational and Financial Mathematics

Research Group: Computational and Financial Mathematics

- Prof. W.K. Ching (*CUHK*) Mathematical modeling, applied computing, optimization

- Dr. G. Han (*Notre Dame*) Coding and information theory

- Dr. J. Song (*Kansas*) Stochastic analysis, mathematical finance, statistics

- Dr. T.K. Wong (*NYU*) Nonlinear partial differential equations, applied mathematics, fluid dynamics, analysis

- Dr. S.P. Yung (*Wisconsin*) Control theory, partial differential equations, financial mathematics

- Dr. Z. Zhang (*Tsinghua*) Scientific computation, biomechanics

- Dr. K. Cai (*Postdoctoral Fellow / Peking U*) Coding theory, combinatorics

3. Minor in Computational and Financial Mathematics

- Usually need a PhD in Mathematics/Physics/Computer Sciences/Statistics to do quantitative finance in investment banks

- Develop and analyze new financial products

- Write programs to evaluate the price of financial derivatives

- Mathematical modeling skills

- Computing skills, e.g., Visual Basic

4. Minor in Operations Research & Mathematical Programming

About the Minor:

- The **Minor in Operations Research & Mathematical Programming** provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making.

- It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from **decision sciences** and **logistic industry**.

4. Minor in Operations Research & Mathematical Programming

Programme

Requirements:

Introductory level courses (18 credits)	
Disciplinary Core Course	(6 credits)
MATH1013	University Mathematics II
Disciplinary Electives	(12 credits)
Select either List A or List B:	
List A	
MATH2101	Linear Algebra I
MATH2211	Multivariable Calculus
List B	
MATH2012	Fundamental Concepts of Mathematics
MATH2014	Multivariable Calculus and Linear Algebra

Advanced level courses (24 credits)	
Disciplinary Core Courses	(12 credits)
MATH3901	Operations Research I
MATH3904	Introduction to Optimization
Disciplinary Electives	(12 credits)
At least 12 credits selected from the following courses:	
MATH3405	Differential Equations
MATH3600	Discrete Mathematics
MATH3905	Queueing Theory and Simulation
MATH3906	Financial Calculus
MATH3911	Game Theory and Strategy
MATH3943	Network Models in Operations Research
MATH4902	Operations Research II
MATH4907	Numerical Methods for Financial Calculus
MATH7502	Topics in Applied Discrete Mathematics
MATH7503	Topics in Mathematical Programming and Optimization

Please also refer to the notes and remarks in *Syllabuses and Regulations: Minor in Operations Research and Mathematical Programming*

4. Minor in Operations Research & Mathematical Programming

Research Group: Optimization and Operations Research

- Prof. W.K. Ching (*CUHK*) Mathematical modeling, applied computing, optimization

- Prof. W. Zang (*Rutgers*) Combinatorics and optimization

- Dr. Z. Qu (*Ecole Polytechnique*) Operations research, optimal control and optimization

- Dr. S.P. Yung (*Wisconsin*) Control theory, partial differential equations, financial mathematics

4. Minor in Operations Research & Mathematical Programming

The operations research courses mainly study different types of the constraint optimization problems.
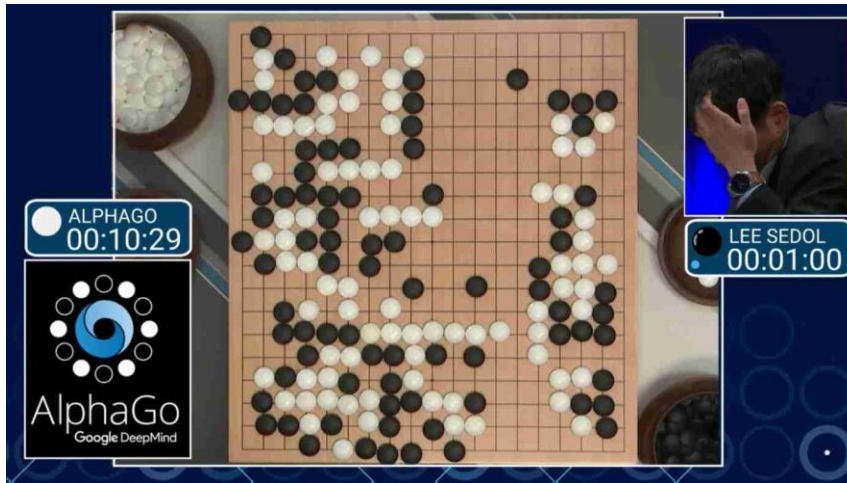
A lot of operations research methods are used in A.I.

2018-19 Major/Minor Talk for BSc I

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Introductory-level Courses

MATH1013   University Mathematics II

MATH2012   Fundamental Concept of Mathematics

MATH2101   Linear Algebra I

MATH2102   Linear Algebra II

MATH2211   Multivariable Calculus

MATH2241   Introduction to Mathematical Analysis

Available in Both Semesters EXCEPT MATH2102 LINEAR ALGEBRA II

MATH1013 University Mathematics II

Teacher

Dr. C.W. Wong (Both Semesters)

Required/Recommended Reading :

Adrian Banner: The Calculus Lifesaver: All the Tools You Need to Excel at Calculus (Princeton University Press, 2007)

George B. Thomas, Maurice D. Weir and Joel Hass: Thomas' Calculus (12th edition, Addison Wesley)
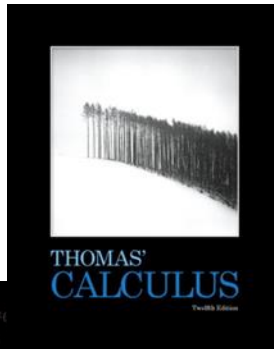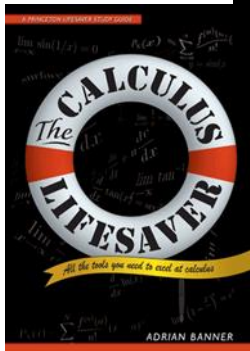
MATH1013 University Mathematics II

- This course aims at students with

  ➢ Core Mathematics plus **M1**, **or**

  ➢ Core Mathematics plus **M2** background

  and provides them with basic knowledge of calculus and some linear algebra that can be applied in various disciplines.

- Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.

- Not for students who have passed MATH1821, or (MATH1851 and MATH1853), or have already enrolled in these courses.

- It is expected to be followed by other Level 2 disciplinary core courses.

MATH1013 University Mathematics II

Contents:

- Functions; graphs; inverse functions

- Limits; continuity and differentiability

- Mean value theorem; implicit differentiation; L'Hopital's rule

- Higher order derivatives; maxima and minima; graph sketching

- Radian, calculus of trigonometric functions

- Definite and indefinite integrals; integration by substitutions; integration by parts; integration by partial fractions

- Complex numbers, polar form, de Moivre's formula

- Applications: Solving first order differential equations

- Basic matrix and vector (of orders 2 and 3) operations, determinants of 2x2 or 3x3 matrices

MATH1013 University Mathematics II

MATH1013

University Mathematics II

MATH2012
Fundamental
Concepts of
Mathematics

MATH2014
Multivariable
Calculus and
Linear Algebra

MATH2101
Linear
Algebra I

MATH2211
Multivariable
Calculus

MATH2241
Introduction to
Mathematical
Analysis

STAT2601
Probability
and
Statistics I

STAT2901
Probability
and
Statistics:
Foundations
of Actuarial
Science

PHYS2150
Methods in
Physics I

PHYS2155
Methods in
Physics II

MATH2102
Linear
Algebra II

STAT2602
Probability
and
Statistics II

MATH1013 University Mathematics II

MATH1013 is also required in the following Major/Minor Programmes:

- Major in Decision Analytics (Core/Compulsory)
- Major in Mathematics (Core/Compulsory)
- Major in Mathematics/Physics (Core/Compulsory)
- Major in Risk Management (Core/Compulsory)
- Major in Statistics (Core/Compulsory)
- Minor in Actuarial Studies (Disciplinary Elective)
- Minor in Computational & Financial Mathematics (Core/Compulsory)
- Minor in Mathematics (Core/Compulsory)
- Minor in Operations Research & Mathematical Programming (Core/Compulsory)

MATH2012 Fundamental Concepts of Mathematics

Teachers

Dr. Y.M. Chan (1st Semester)

Prof. J.H. Lu (2nd Semester)

Required/Recommended Reading :

Gary Chartrand, Albert D. Polimeni, Ping Zhang: Mathematical Proofs: A Transition to Advanced Mathematics (Pearson, 2012, Third Edition)

MATH2012 Fundamental Concepts of Mathematics

Pre-requisites:

Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)

Remark:

Students with good grades in HKDSE Math M1 or M2 (or other equivalent qualifications) and have strong interests in math may also apply for taking this course concurrently with its prerequisites courses (subject to the approval from Course Selection Advisors).

MATH2012 Fundamental Concepts of Mathematics

- This course is designed to introduce students to the fundamental concepts of mathematics such as **sets**, **number systems**, **relations**, **functions** and **cardinality**.

- It also serves as a bridge between computational and proof-based courses. By means of a wide variety of **proof-writing** and **oral presentation practice**, students will learn to communicate mathematics emphasizing precise logic and clear exposition.

- We hope that this course can invite students to explore mathematics more deeply and even entice some of them to become mathematics majors.

- This course can be taken concurrently with other Level 2 or above courses.

MATH2101 Linear Algebra I

Teacher

Dr. K.H. Law (Both Semesters)

Required/Recommended Reading :

Spence, Insel & Friedberg: Elementary Linear Algebra -- A Matrix Approach (Pearson, 2014)

MATH2101 Linear Algebra I

Pre-requisites:

Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)

- This is a first university level course on linear algebra, which aims at introducing to students the basic concept of linear structure through many concrete examples in the Euclidean spaces.

- The course also enriches students' exposure to mathematical rigor and prepares them for studying more advanced mathematical courses.

MATH2102 Linear Algebra II

Teacher

To be confirmed (2nd semester)

Required/Recommended Reading :

S. Friedberg, A. Insel, L. Spence: Linear algebra (Pearson, 4th edition)

MATH2102 Linear Algebra II

Pre-requisites:

Pass in MATH2101 or (MATH1821 and MATH2822)

- This is a follow-up of the course Linear Algebra I. It aims at introducing the general concept of vector spaces, subspaces, dimensions, inner product spaces, etc.

- The course prepares the foundation on linear algebra for students' future study in mathematics and other disciplines.

- Many examples of applications will be drawn on different subject areas.

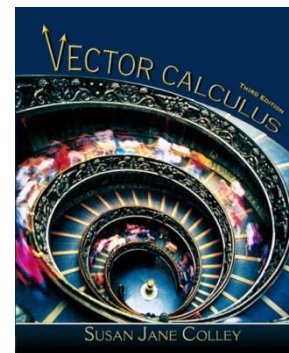# MATH2211 Multivariable Calculus

Teachers

Dr. Z. Hua (1st semester)

Prof. W.S. Cheung (2nd semester)

Required/Recommended Reading :

Susan J. Colley: Vector Calculus (Pearson, 2011, 4th edition)

MATH2211 Multivariable Calculus

Pre-requisites:

Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)

- Students of this course will learn the theory of multivariable calculus and learn how to apply the theory to solve practical problem.

- This is a required course for Mathematics and Mathematics/Physics Majors, and is suitable for all students in Science, Engineering, Economics and Finance, and other students who will use multivariable calculus in their areas of study.

- This is also a required course for all Minors offered by the Department of Mathematics, and is a pre-requisite of many advanced level mathematics courses.

MATH2241 Introduction to Mathematical Analysis

Teacher

Dr. Y.M. Chan (Both Semesters)

Required/Recommended Reading :

Robert G. Bartle, Donald R. Sherbert: Introduction to Real Analysis (Wiley, 2011, Fourth Edition)

Kenneth A. Ross: Elementary Analysis: The Theory of Calculus (Springer, 2013, Second Edition)

MATH2241 Introduction to Mathematical Analysis

Pre-requisites:

Pass in MATH1013 or (MATH1851 and MATH1853) or MATH2822.

Students are strongly recommended to have taken MATH2012 if they wish to take this course.

- To introduce students to the basic ideas and techniques of mathematical analysis.

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Suggested Study Plans

You can find several suggested study plans in p.7-9 of the document:

Advice on Course Selection (2018-19)

Suggested Study Plans

For students intending to major in mathematics

Plan A – with the prerequisites of MATH1013 at the beginning of Year 1 Sem 1 (for example, students with M1 or M2 in HKDSE, or other equivalent qualifications (**Appendix 3.2**)):

Year 1	Sem 1	MATH1013 University Mathematics II
	Sem 2	MATH2012 Fundamental Concepts of Mathematics MATH2211 Multivariable Calculus
Year 2	Sem 1	MATH2101 Linear Algebra I
	Sem 2	MATH2102 Linear Algebra II MATH2241 Introduction to Mathematical Analysis

Plan A : For students intending to **major in mathematics**
(with the prerequisites of MATH1013 at the beginning of Year 1 Sem 1)

Remark: Following this plan, you will complete all the introductory level disciplinary courses as required by the major programme by the end of your second year.

Suggested Study Plans

For students intending to major in mathematics

<u>Plan B</u> – without the prerequisites of MATH1013 at the beginning of Year 1 Sem 1:

Year 1	Sem 1	MATH1011 University Mathematics I **OR**
		† MATH1009 Basic Mathematics for Business and Economics
	Sem 2	MATH1013 University Mathematics II
Year 2	Sem 1	MATH2012 Fundamental Concepts of Mathematics
		MATH2211 Multivariable Calculus
	Sem 2	MATH2101 Linear Algebra I
		MATH2241 Introduction to Mathematical Analysis

Plan B : For students intending to **major in mathematics**
(without the prerequisites of MATH1013 at the beginning of Year 1 Sem 1)

† MATH1009 Basic Mathematics for Business and Economics is **NOT** for students from the Faculty of Science or Engineering. It is **NOT** for students who have passed MATH1011 or MATH1013, or have already enrolled in these courses.

Suggested Study Plans

For students intending to major in mathematics

Plan C – this is an example of study plan for more aggressive students (assuming the prerequisites of MATH1013 at the beginning of Year 1 Sem 1 are satisfied):

Year 1	Sem 1	MATH1013 University Mathematics II † MATH2012 Fundamental Concepts of Mathematics
	Sem 2	MATH2101 Linear Algebra I MATH2211 Multivariable Calculus
Year 2	Sem 1	MATH2241 Introduction to Mathematical Analysis MATH3401 Analysis I
	Sem 2	MATH2102 Linear Algebra II MATH3XXX

Plan C : For more aggressive students intending to **major in mathematics**

† Note that you need to seek approval from one of our *Course Selection Advisers* (see **Appendix 3.1**) for taking MATH2012 concurrently with MATH1013.

Remark: Following this plan, you are able to enroll to some of our advanced level courses in your second year.

Suggested Study Plans

For students intending to minor in mathematics/minor in computational and financial mathematics/minor in operations research and mathematical programming

- Students doing a major in decision analytics, major in risk management, major in economics/finance or major in quantitative finance are **highly recommended** to attempt one of our minor programmes.

Plan D

Year 1	Sem 1	
	Sem 2	MATH1013 University Mathematics II
Year 2	Sem 1	Any one course from List X (X = A or B)
	Sem 2	The other course from List X
	List A	MATH2101 Linear Algebra I MATH2211 Multivariable Calculus
	List B	MATH2012 Fundamental Concepts of Mathematics MATH2014 Multivariable Calculus and Linear Algebra

Plan D : For students intending to do one of our **minor programmes**

Remark: Year 1 Sem 1 is left blank for mathematics courses to reserve room for the major and faculty requirements. However, students without the prerequisites of MATH1013 are suggested to put MATH1009 or MATH1011 in this semester.

Suggested Study Plans

For students intending to minor in mathematics/minor in computational and financial mathematics/minor in operations research and mathematical programming

- Students doing a major in decision analytics, major in risk management, major in economics/finance or major in quantitative finance are **highly recommended** to attempt one of our minor programmes.

If you are more aggressive and would like to explore more about mathematics, then you can try the following:

Plan E

Year 1	Sem 1	MATH1013 University Mathematics II
	Sem 2	MATH2012 Fundamental Concepts of Mathematics MATH2101 Linear Algebra I
Year 2	Sem 1	MATH2211 Multivariable Calculus MATH2241 Introduction to Mathematical Analysis
	Sem 2	Advanced Level Disciplinary Core Courses or Electives

Plan E : For more aggressive students intending to do one of our **minor programmes**

Remark: In this plan students will take courses from List A to fulfill the introductory level Disciplinary Electives requirement (for any of our minor programmes).

2018-19 Major/Minor Talk for BSc I

Schedule

1. Introduction and Programme Requirements

2. Our Major and Minor Programmes

3. Introductory-level Courses

4. Suggested Study Plans

5. Career Prospects and Graduate Studies

6. Course Selections Advisers and Student Peer Advisers

7. Q&A

Career Prospects

What can I do with a major/minor in mathematics?

- Mathematics Major graduates find employment in commerce (banking and finance), service industry (insurance and the Government) and education (secondary schools and universities) sectors

- Many of our graduates pursue their interests in other disciplines instead, where their mathematical training is a crucial advantage

Career Prospects

Job Opportunities:

- Logistics companies
- Airport Authority Hong Kong
- Banks (data mining)
- Software companies
- Insurance companies
- Transportation consulting firms
- Computer Animation and Digital Imaging
- Meteorologist

Graduate Studies

Many of our graduates continue their postgraduate studies (Master and PhD) in overseas or local universities

Students who have done well in

MATH3999 Directed Studies in Mathematics,

MATH4910 Senior Mathematics Seminar,

MATH4999 Mathematics Projects,

plus some oversea exchange and summer research experience have better chances to get into top graduate schools

2018-19 Major/Minor Talk for BSc I

Schedule

Course Selection Advisers

For major-specific and course selection guidance, you are encouraged to seek advice from **Course Selection Advisers**.

Mathematics	Computational & Financial Mathematics *(Minor)* / Operations Research & Mathematical Programming *(Minor)*	Dr Chi Wing WONG	Office: Room 313, Run Run Shaw Bldg Email: cwwongab@hku.hk Tel: 2857 8574
		Dr Siu Pang YUNG	Office: Room 415, Run Run Shaw Bldg Email: spyung@hku.hk Tel: 2859 1992
	Mathematics	Dr Yat Ming CHAN	Office: Room 312, Run Run Shaw Bldg Email: ymchan@maths.hku.hk Tel: 2241 5198
		Dr Guangyue HAN	Office: Room 423, Run Run Shaw Bldg Email: ghan@maths.hku.hk Tel: 2857 8573
		Dr Ka Ho LAW	Office: Room 314, Run Run Shaw Bldg Email: lawkaho@maths.hku.hk Tel: 2857 8591
		Dr Chi Wing WONG	Office: Room 313, Run Run Shaw Bldg Email: cwwongab@hku.hk Tel: 2857 8574
		Dr Haiyu ZHANG	Office: Room 311, Run Run Shaw Bldg Email: hyzhang@maths.hku.hk Tel: 2241 5216

Student Peer Advisers (SPAs)

First year students and students admitted directly to the third year can also seek academic advice from a group of dedicated senior students known as **Student Peer Advisers**.

Student Peer Advisers (SPAs) of Mathematics major:

- Mr. LAM Yik Ho (BSc Year 4)

- Miss LEUNG Joyce Wei Yin (BSc Year 4)

- Mr. MAK Sio Teng (BSc Year 2)

Their contact information can be found in
http://www.scifac.hku.hk/ug/current/advising/bsc/office

THANK YOU!

Dr. Y.M. Chan

Department of Mathematics, HKU

Aug 10, 2018