

(Study Scheme - English)

Programme Title

Bioinformatics

Study Scheme

Applicable to students admitted in 2017-18 and 2018-19

Major Programme Requirement

Students are required to complete a minimum of 72 units of courses as follows:

	Units
1. School Package:	
BIO2001, CHM1001, CSC1001, 1002, MAT1001 or 1003, 1002 or 1004, 2040, PHY1001, STA2001	25
2. Required Courses:	
BIM3001, 3002, 3009, BIO3001, CSC4008, DDA2020, GNB2001, 2002, 2005	27
3. Elective Courses:	
6 to 7 courses selected from the following:	20
BIM2006, 3006, 3007, 3010, 3011, 3014, 3016, 3018, 3019, 4001, 4003, BIO2003, 2101, 2104, 3101, 3207, 3213, 3214, 3901, 3902, 3903, 3904, 4201, 4202, 4203, 4204, 4205, CSC3002, DDA4210, 4220, MAT3300, STA2002, 3006, BSC6003	
Total:	72

Notes:

- [a] All Major Required and Major Elective courses at 2000 level and above will be included in the calculation of Major GPA for honours classification.
- [b] Students should follow the Policy on Undergraduate Students taking Postgraduate Courses when enrolling BSC6003.

(Study Scheme - Chinese)

課程名稱
生物信息學

修讀辦法

二〇一七至一八及二〇一八至一九年度入學學生適用

主修課程要求

學生須至少修畢以下科目共 72 學分：

學分

1. 學院課程：

BIO2001, CHM1001, CSC1001, 1002, MAT1001 or 1003, 1002 or 1004, 2040, PHY1001, STA2001 25

2. 必修科目：

BIM3001, 3002, 3009, BIO3001, CSC4008, DDA2020, GNB2001, 2002, 2005 27

3. 選修科目：

從以下選修六至七科： 20
BIM2006, 3006, 3007, 3010, 3011, 3014, 3016, 3018, 3019, 4001, 4003, BIO2003, 2101, 2104, 3101, 3207, 3213, 3214, 3901, 3902, 3903, 3904, 4201, 4202, 4203, 4204, 4205, CSC3002, DDA4210, 4220, MAT3300, STA2002, 3006, BSC6003

共： 72

註：

[a] 所有 2000 及以上程度的主修必修和主修選修科目將會計入主修科目之平均績點，並用以厘定學位等級。

[b] 在選擇 BSC6003 時，學生需遵守學校關於本科生修讀研究生科目的相關規定。

(Recommended Course Pattern - English)

Recommended Course Pattern

- Sufficient units should be allowed in each term for students to fulfill the University Core Requirements, which include: (i) 3 units of Chinese; (ii) 12 units of English; (iii) 1 unit of IT; (iv) 18 units of General Education; and (v) 2 units of Physical Education and Health.
- Programmes with different streams/concentrations are required to provide the recommended pattern for each stream/concentration.

Major Programme Requirement of <u>Bioinformatics</u>		
	Recommended Course Pattern	Units
First Year of Attendance	1 st term School Package: BIO2001, CHM1001, MAT1001 (or MAT1003)	9
	2 nd term School Package: CSC1001, 1002, MAT1002 (or MAT1004), STA2001	10
Second Year of Attendance	1 st term School Package: MAT2040 Major Required: GNB2001, 2002	3 6
	2 nd term School Package: PHY1001 Major Required: BIO3001, 2005 Major Elective: one course from Major Elective(s)	3 6 3
	1 st term Major Required: BIM3001, DDA2020 Major Elective(s): one course from Major Elective(s)	6 3
Third Year of Attendance	2 nd term Major Required: BIM3002, 3009, CSC4008 Major Elective(s): one course from Major Elective(s)	9 3
	1 st term Major Elective(s): two courses from Major Elective(s)	6
Fourth Year of Attendance	2 nd term Major Elective(s): two courses from Major Elective(s)	5
	Total (Major Requirement including School Package):	72

(Recommended Course Pattern - Chinese)

修課推介

1. 每學期均須預留足夠學分讓同學符合大學核心課程要求，包括：(一) 中文三學分；(二) 英文十二學分；(三) 信息科技一學分；(四) 通識教育十八學分及(五) 體育與健康兩學分。
2. 有不同專修範圍的課程須為每項專修範圍提供修課推介。

生物信息學主修課程要求		
	修課推介	學分
第一修業學年	第一學期 學院課程: BIO2001, CHM1001, MAT1001 (or MAT1003)	9
	第二學期 學院課程: CSC1001, 1002, MAT1002 (or MAT1004), STA2001	10
第二修業學年	第一學期 學院課程: MAT2040 主修必修科目: GNB2001, 2002	3 6
	第二學期 學院課程: PHY1001 主修必修科目: BIO3001, GNB2005 主修選修科目: 從主修選修科目選修一科	3 6 3
第三修業學年	第一學期 主修必修科目: BIM3001, DDA2020 主修選修科目: 從主修選修科目選修一科	6 3
	第二學期 主修必修科目: BIM3002, 3009, CSC4008 主修選修科目: 從主修選修科目選修一科	9 3
第四修業學年	第一學期 主修選修科目: 從主修選修科目選修兩科	6
	第二學期 主修選修科目: 從主修選修科目選修兩科	5
合共 (主修要求包括學院課程):		72

Course List

I. School Package

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIO2001	General Biology	普通生物	3
CHM1001	General Chemistry	普通化學	3
CSC1001	Introduction to Computer Science: Programming Methodology	計算機科學導論：程序設計方法	3
CSC1002	Computational Laboratory	計算機實驗	1
MAT1001	Calculus I	微積分（一）	3
MAT1002	Calculus II	微積分（二）	3
MAT1003	Mathematical Analysis I	數學分析（一）	3
MAT1004	Mathematical Analysis II	數學分析（二）	3
MAT2040	Linear Algebra	線性代數	3
PHY1001	Mechanics	力學	3
STA2001	Probability and Statistics I	概率及統計（一）	3

* Students may choose either MAT1001 or MAT1003; and MAT1002 or MAT1004.

II. Major Required

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIM3001	Bioinformatics	生物信息學	3
BIM3002	Genetic Engineering	基因工程學	3
BIM3009	Design and Analysis of Bioinformatics Algorithms	生物算法設計及分析	3
BIO3001*	Genetics	遺傳學	3
CSC4008	Techniques for Data Mining	數據挖掘技術	3
DDA2020*	Machine Learning	機器學習	3
GNB2001	Molecular Biology and Biochemistry	分子生物學和生物化學	3
GNB2002	Cell Biology	細胞生物學	3
GNB2005	Computational Biology	計算生物學	3

III. Major Elective

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIM2006	The Merge of Information Technology and Biotechnology	IT 和 BT 的融合及在生命與健康科學中的應用	2
BIM3006	Macromolecules and Molecular Pharmacology	大分子功能調節和分子藥理學	3
BIM3007	Computational Genomics & Proteomics	計算基因組學和蛋白質組學	3
BIM3010	Molecular Simulations & Modeling I	分子模擬與建模 I	3
BIM3011	Molecular Simulations & Modeling II	分子模擬與建模 II	3
BIM3014	Statistical Biological Database and Data Visualization	統計生物數據庫和數據可視化	3
BIM3016	Human Anatomy	人體解剖學	2

BIM3018	Biophysical Chemistry	生物物理化學	3
BIM3019	Computational Biology Laboratory	計算生物學實驗	2
BIM4001	Frontier Life Science Topics and Reviews	生物科學前沿講座與文獻綜述	3
BIM4003	Student Research and Innovation	學生科技創新項目	3
BIO2003*	Organic Chemistry	有機化學	3
BIO2101*	Comprehensive Biology Laboratory	綜合生物學實驗	3
BIO2104*	Biochemistry Laboratory	生物化學實驗	3
BIO3101*	Genetics and Molecular Biology Laboratory	遺傳學與分子生物學實驗	3
BIO3207*	Animal Physiology	動物生理學	3
BIO3213*	Protein Structure Analysis and Proteomics	蛋白質結構分析和蛋白質組學	3
BIO3214	Neurobiology	神經生物學	3
BIO3901	Research Internship I	研究實習（一）	1
BIO3902	Research Internship II	研究實習（二）	1
BIO3903	Research Internship III	研究實習（三）	1
BIO3904	Research Internship IV	研究實習（四）	1
BIO4201*	Epigenetics	表觀遺傳學	2
BIO4202*	Nucleic Acids	核酸	3
BIO4203*	Immunology	免疫學	3
BIO4204*	Cancer Biology	癌症生物學	3
BIO4205*	Biophysics	生物物理學	3
CSC3002*	C/C++ Programming	C/C++程序設計	3
DDA4210	Advanced Machine Learning	高等機器學習	3
DDA4220	Deep Learning and Applications	深度學習與應用	3
MAT3300	Mathematical Modelling	數學建模	3
STA2002	Probability and Statistics II	概率及統計（二）	3
STA3006	Design and Analysis of Experiments	實驗設計與分析	3
BSC6003	Molecular Pharmacology and Modern Drug Development Research	分子藥理學與現代藥物研發	3

* The course code of Genetics is BIM2003 or GNB2003 for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO3001.

在 2021-22 學年第一學期前修讀「遺傳學」，科目代碼為 BIM2003 或 GNB2003。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO3001。

* The course title of CSC4020 is Fundamental of Machine Learning for students who study the course before 2021-22 term 1. For students who study this course from 2021-22 term 1, the course code is DDA2020 and the course title is Machine Learning.

在 2021-22 學年第一學期前修讀 CSC4020，科目名稱為「機器學習之基礎課程」。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「DDA2020 機器學習」。

* The course code of Organic Chemistry is BIM3013 for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO2003.

在 2021-22 學年第一學期前修讀「有機化學」，科目代碼為 BIM3013。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO2003。

* The course title of BIO2032 is Biology Laboratory and credit is 1 unit for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO2101, the course title is Comprehensive Biology Laboratory and the credit is 3 units.

在 2021-22 學年第一學期前修讀 BIO2032，科目名稱為「生物實驗」，學分為 1 分。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「BIO2101 綜合生物實驗」，學分為 3 分。

* The course title of BIM3005 is Biochemistry and Cell Biology Laboratory and credit is 2 units for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO2104, the course title is Biochemistry Laboratory and credit is 3 units.

在 2021-22 學年第一學期前修讀 BIM3005，科目名稱為「生物化學和細胞生物學實驗」，學分為 2 分。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「BIO2104 生物化學實驗」，學分為 3 分。

* The course title of BIM2004 is Genetics Laboratory and credit is 2 units for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO3101, the credit is 3 units, and the course title is Genetics and Molecular Biology Laboratory.

在 2021-22 學年第一學期前修讀 BIM2004，科目名稱為「遺傳學實驗」，學分為 2 分。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「BIO3101 遺傳學與分子生物學實驗」，學分為 3 分。

* The course title of BME3005 is Basic and Applied Immunology for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO4203 and the course title is Immunology. BME3005 Basic and Applied Immunology and BIO4203 Immunology are equivalent with BSC6015 Immunology.

在 2021-22 學年第一學期前修讀 BME3005，科目名稱為「基礎與應用免疫學」。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「BIO4203 免疫學」。「BME3005 基礎與應用免疫學」及「BIO4203 免疫學」對應碩博科目代碼及名稱「BSC6015 免疫學」。

* The course code of Animal Physiology is BIM3004 for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO3207.

在 2021-22 學年第一學期前修讀「動物生理學」，科目代碼為 BIM3004。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO3207。

* The course code of Protein Structure Analysis and Proteomics is GNB3003 or BIM3003 for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO3213.

在 2021-22 學年第一學期前修讀「蛋白質結構分析和蛋白質組學」，科目代碼為 GNB3003 或 BIM3003。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO3213。

* BIO4204 Cancer Biology is equivalent with BSC6007 Cancer Biology. BIO4201 Epigenetics is equivalent with BSC6026 Epigenetics. BIO4202 Nucleic Acids is equivalent with BSC6027 Nucleic Acids.

科目代碼及名稱「BIO4204 癌症生物學」對應碩博科目代碼及名稱「BSC6007 癌症生物學」，科目代碼及名稱「BIO4201 表觀遺傳學」對應碩博科目代碼及名稱「BSC6026 表觀遺傳學」，科目代碼及名稱「BIO4202 核酸」對應碩博科目代碼及名稱「BSC6027 核酸」。

* The course title of BIM3012 is Molecular Biophysics for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course code is BIO4205 and the course title is Biophysics.

在 2021-22 學年第一學期前修讀 BIM3012，科目名稱為「分子生物物理」。在 2021-22 學年第一學期及以後修讀該科目，科目代碼及名稱為「BIO4205 生物物理學」。

* The course title of CSC3002 is Introduction to Computer Science: Programming Paradigms for students who study the course before 2022-23 term 2. For students who study CSC3002 from 2022-23 term 2, the course title is C/C++ Programming.

在 2022-23 學年第二学期前修讀 CSC3002，科目名稱為「計算機科學導論：程序設計範式」。在 2022-23 學年第二学期及以後修讀 CSC3002，科目名稱為「C/C++程序設計」。