

(Study Scheme - English)

Programme Title

Biomedical Science and Engineering

Study Scheme

Applicable to students admitted in 2020-21

Major Programme Requirement

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

	Units
1. School Package:	
BIO1001, CHM1001, CSC1001, 1002, MAT1001, 2040, PHY1001, STA2001	22
2. Required Courses:	
BIO2002, 2003, 2101, BME2001, 3001, 3006, 4012, 4013, CHM1002, EIE1810, 2001, 3001, PHY1002	34
3. Elective Courses:	
16 units selected from the following:	16
BIM3001, 3006, 3008, 4001, 4003, BIO3213, 3214, 3901, 3902, 3903, 3904, 4203, BME3002, 3003, 3201, 3320, 4001, 4003, 4004, 4006, 4007, 4008, 4009, 4010, 4011, 4014, 4201, CSC3150, 4001, DME3004, 3006, 3007, 4004, 4006, ECE4300, ERG2001, 3001, 4001, MAT1002, 3007, 3220, MSE3004, 3007, 4005, PHY2001, 2002, 3002, 4002, STA4001	
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.

(Study Scheme - Chinese)

課程名稱

生物醫學工程

修讀辦法

二〇二〇至二一年度入學學生適用

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： BIO1001, CHM1001, CSC1001, 1002, MAT1001, 2040, PHY1001, STA2001	22
2. 必修科目： BIO2002, 2003, 2101, BME2001, 3001, 3006, 4012, 4013, CHM1002, EIE1810, 2001, 3001, PHY1002	34
3. 選修科目： 從以下選修 16 學分： BIM3001, 3006, 3008, 4001, 4003, BIO3213, 3214, 3901, 3902, 3903, 3904, 4203, BME3002, 3003, 3201, 3320, 4001, 4003, 4004, 4006, 4007, 4008, 4009, 4010, 4011, 4014, 4201, CSC3150, 4001, DME3004, 3006, 3007, 4004, 4006, ECE4300, ERG2001, 3001, 4001, MAT1002, 3007, 3220, MSE3004, 3007, 4005, PHY2001, 2002, 3002, 4002, STA4001	16
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，並用以釐定學位等級。

(Recommended Course Pattern - English)

Recommended Course Pattern

1. 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.
2. Programmes with different streams/concentrations are required to provide the recommended pattern for each stream/concentration.

Major Programme Requirement of <u>Biomedical Science and Engineering</u>		
	Recommended Course Pattern	Units
First Year of Attendance	1 st term School Package: CHM1001, CSC1001, MAT1001	9
	2 nd term School Package: BIO1001, CSC1002, PHY1001	7
Second Year of Attendance	1 st term School Package: MAT2040 Major Required: CHM1002, EIE1810, 2001, PHY1002	3 7
	2 nd term School Package: STA2001 Major Required: BIO2003, BME2001, EIE3001	3 10
Third Year of Attendance	1 st term Major Required: BIO2002, 2101, BME3001, 4012 Major Elective(s): Any one Elective course	11 3
	2 nd term Major Required: BME3006, 4013 Major Elective(s): Any one Elective course	6 3
Fourth Year of Attendance	1 st term Major Elective(s): Any two Elective courses	5-6
	2 nd term Major Elective(s): Any two Elective courses	5-6
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。

生物醫學工程主修課程要求		
	修課推介	學分
第一修業學年	第一學期 學院課程: CHM1001, CSC1001, MAT1001	9
	第二學期 學院課程: BIO1001, CSC1002, PHY1001	7
第二修業學年	第一學期 學院課程: MAT2040 主修必修科目: CHM1002, EIE1810, 2001, PHY1002	3 7
	第二學期 學院課程: STA2001 主修必修科目: BIO2003, BME2001, EIE3001	3 10
第三修業學年	第一學期 主修必修科目: BIO2002, 2101, BME3001, 4012 主修選修科目: 一科選修科目	11 3
	第二學期 主修必修科目: BME3006, 4013 主修選修科目: 一科選修科目	6 3
第四修業學年	第一學期 主修選修科目: 兩科選修科目	5-6
	第二學期 主修選修科目: 兩科選修科目	5-6
合共 (主修要求包括學院課程):		72

Course List

I. School Package for the School of Life and Health Sciences

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIO1001	General Biology	普通生物學	3
CHM1001	General Chemistry	普通化學	3
CSC1001	Introduction to Computer Science: Programming Methodology	計算機科學導論：程式設計方法	3
CSC1002	Computational Laboratory	計算機實驗	1
MAT1001	Calculus I	微積分 (一)	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

II. Major Required courses

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIO2002*	Cell and Molecular Biology	細胞與分子生物學	3
BIO2003*	Organic Chemistry	有機化學	3
BIO2101*	Comprehensive Biology Laboratory	綜合生物學實驗	3
BME2001	Anatomy/Physiology	解剖學/生理學	4
BME3001*	Introduction to Biomedical Engineering I	生物醫學工程導論 (一)	2
BME3006	Biosensors and Medical Devices	生物传感器和生物医疗器械	3
BME4012	BME Final Year Project I	生物醫學工程畢業設計 (一)	3
BME4013	BME Final Year Project II	生物醫學工程畢業設計 (二)	3
CHM1002	Chemistry Laboratory	化學實驗	1
EIE1810	Electronic Circuit Design Laboratory	電子線路設計實驗	1
EIE2001	Basic Circuit Theory	基本電路理論	3
EIE3001	Signals and Systems	信號與系統	3
PHY1002	Physics Laboratory	物理實驗	2

III. Major Elective courses

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIM3001	Bioinformatics	生物信息學	3
BIM3006*	Macromolecules and Molecular Pharmacology	大分子功能調節和分子藥理學	3
BIM3008	Machine Learning in Computational Biology	計算生物學中的機器學習	3
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
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
BIO4203*	Immunology	免疫學	3
BME3002	Systems Bioengineering I: Cells and CV Systems	系統生物工程 (一) : 細胞與心血管系統	3
BME3003	Introduction to Biomedical Engineering II	生物醫學導論 (二)	2
BME3201	Biomedical Instrument Design	生物醫學儀器設計	3
BME3320	Biomedical Imaging	生物醫學影像	3
BME4001	Biological Systems and Control	生物系統與控制	3
BME4003*	Systems Bioengineering II: Neural Systems	系統生物工程 (二) : 神經系統	2
BME4004	Systems Bioengineering III: Genes to Organs	系統生物工程 (三) : 從基因到器官	3
BME4006	Biomaterials	生物材料	3
BME4007	Tissue Engineering	組織工程	3
BME4008	Biomechanics of the Human Body	人體生物力學	3
BME4009	Clinical Laboratory Science	臨床實驗室科學	3
BME4010	3D Biofabrication and Regenerative Medicine	3D生物製造與再生醫學	3
BME4011	Nanobiotechnology	納米生物技術	3
BME4014	Practical Internship in Biomedical Engineering	生物醫學工程實踐實習	3
BME4201*	Advanced Biosensing Technologies	先進生物傳感器技術	3
CSC3150	Operating System	操作系統	3
CSC4001	Software Engineering	軟件工程	3
DME3004	Aesthetic and Human Values in Engineering Product Design	工程產品設計審美與人類價值	3
DME3006	Computer-Aided Design	計算機輔助設計	3
DME3007	Simulation	仿真	3
DME4004	Production Planning and Project Management	生產策劃與項目管理	3
DME4006	Organizational Behaviour	組織行為學	3
ECE4300	Systems Design in Human Computer Interaction	人機交互系統設計	3
ERG2001	Engineering Economics	工程經濟學	3
ERG3001	Engineering Ethics, Safety and Practice	工程倫理、安全及實務	3

ERG4001	Principles of Entrepreneurship	創業原則	3
MAT1002	Calculus II	微積分 (二)	3
MAT3007	Optimization	最優化	3
MAT3220	Operations Research	運籌學	3
MSE3004	Mechanical Behaviour and Fracture of Materials	材料的力學性能與破斷	3
MSE3007	Electronic, Optical, and Magnetic Properties of Materials	材料的電學、光學及磁學性質	3
MSE4005	Nanoscale Materials	納米材料	3
PHY2001	Electricity and Magnetism	電磁學	3
PHY2002	Thermodynamics	熱力學	3
PHY3002	Electrodynamics I	電動力學(一)	3
PHY4002	Electrodynamics II	電動力學(二)	3
STA4001	Stochastic Processes	隨機過程	3

* The course code of Cell and Molecular Biology is BIO1002 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 BIO2002.

在 2021-22 學年第一學期前修讀「細胞與分子生物學」，科目代碼為 BIO1002。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO2002。

* 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 BME3001 is Biomedical Modeling and Design I for students who study the course before 2021-2022 term 1. For students who study this course from 2021-2022 term 1, the course title is Introduction to Biomedical Engineering I.

在 2021-22 學年第一學期前修讀 BME3001，科目名稱為「生物醫學建模與設計 (一)」。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「BME3001 生物醫學工程導論 (一)」。

* The course code of Macromolecules and Molecular Pharmacology is GNB3006 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 BIM3006.

在 2021-22 學年第一學期前修讀「大分子功能調節和分子藥理學」，科目代碼為 GNB3006。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIM3006。

* 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 Protein Structure Analysis and Proteomics is BIM3003 or GNB3003 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 BIM3003 或 GNB3003。在 2021-22 學年第一學期及以後修讀該科目，科目代碼為 BIO3213。

* The unit of BME4003 Systems Bioengineering II: Neural Systems is 3 for students who study the course before 2021-2022 term 2. For students who study this course from 2021-22 term 2, the course unit is 2.

在 2021-22 學年第二學期前修讀「BME4003 系統生物工程 (二): 神經系統」，學分為 3 分。在 2021-22 學年第二學期及以後修讀該科目，學分為 2 分。

* BME4201 Advanced Biosensing Technologies is equivalent with BSC6029 Advanced Biosensing Technologies.

科目代碼及名稱「BME4201 先進生物傳感器技術」對應碩博科目代碼及名稱「BSC6029 先進生物傳感器技術」。

* The course title of PHY3002 is Electrodynamics for students who study the course before 2023-2024 term 1. For students who study this course from 2023-2024 term 1, the course title is Electrodynamics I.

在 2023-24 學年第一學期前修讀 PHY3002，科目名稱為「電動力學」。在 2023-24 學年第一學期及以後修讀該科目，科目名稱為「電動力學 (一)」。