

(Study Scheme - English)

<b>Programme Title</b> New Energy Science and Engineering	
<b>Study Scheme</b>	
<b>Applicable to students admitted in 2015-16</b>	
<b>Major Programme Requirement</b>	
Students are required to complete a minimum of 72 units of courses as follows:	
	Units
1. School Package: BIO2001, CHM1001, CSC1001, 1002, MAT1001/1003, 1002/1004, 2040, STA2001, PHY1001	25
2. Required Courses: CHM1002, 2002, ENE3001, 3002, 3050, 4003, MAT2002, PHY1002, 2001, 2002, 3006	29
3. Elective Courses: 18 units of courses selected from the following: CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221	18
<b>Total:</b>	<b>72</b>
<b>Note:</b> [1] 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

新能源科學與工程

修讀辦法

二〇一五至一六年度入學學生適用

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, MAT1001/1003, 1002/1004, 2040, STA2001, PHY1001	25
2. 必修科目： CHM1002, 2002, ENE3001, 3002, 3050, 4003, MAT2002, PHY1002, 2001, 2002, 3006	29
3. 選修科目： 從以下選修18學分： CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221	18
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	72

註：

[1] 所有2000 及以上程度的主修必修和主修选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

- 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.

<b>Major Programme Requirement of <u>New Energy Science and Engineering</u></b>		
	<b>Recommended Course Pattern</b>	<b>Units</b>
<b>First Year of Attendance</b>	1 <sup>st</sup> term School Package: CHM1001, MAT1001/1003, PHY1001 Major Required:	9
	2 <sup>nd</sup> term School Package: CSC1001, 1002, MAT1002/1004, STA2001 Major Required:	10
<b>Second Year of Attendance</b>	1 <sup>st</sup> term School Package: MAT2040 Major Required: PHY1002, CHM1002, 2002	3 6
	2 <sup>nd</sup> term School Package: BIO2001 Major Required: PHY2001, MAT2002	3 6
<b>Third Year of Attendance</b>	1 <sup>st</sup> term Major Required: PHY2002, ENE3001 Major Elective(s): one to two course(s) from CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221	6 2-6
	2 <sup>nd</sup> term Major Required: PHY3006, ENE3002 Major Elective(s): one to two course(s) from CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221	5 2-6
<b>Fourth Year of Attendance</b>	1 <sup>st</sup> term Major Required: ENE3050, 4003 Major Elective(s): one to two course(s) from CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221	6 2-6

	<p>2<sup>nd</sup> term</p> <p>Major Elective(s): three to four course(s) from CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006,4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221</p>	8-12
<b>Total (Major Requirement including School Package):</b>		<b>72</b>

## (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) 資訊科技一學分；(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。

新能源科學與工程主修課程要求		
	修課推介	學分
第一修業學年	第一學期 學院課程: CHM1001, MAT1001/1003, PHY1001	9
	第二學期 學院課程: CSC1001, 1002, MAT1002/1004, STA2001	10
第二修業學年	第一學期 學院課程: MAT2040 主修必修科目: PHY1002, CHM1002, 2002	3 6
	第二學期 學院課程: BIO2001 主修必修科目: PHY2001, MAT2002	3 6
第三修業學年	第一學期 主修必修科目: PHY2002, ENE3001 主修選修科目: 從CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221選修一至兩科	6 2-6
	第二學期 主修必修科目: PHY3006, ENE3002 主修選修科目: 從CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221選修一至兩科	5 2-6
第四修業學年	第一學期 主修必修科目: ENE3050, 4003 主修選修科目: 從CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221選修一至兩科	6 2-6
	第二學期 主修選修科目: 從CHM2001, CSC3002, 3150, DDA2020, ENE3003, 3004, 3005, 3006, 4001, 4002, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, MAT3007, 3220, STA2002, MSE3002, 3007, 3009, 4003, 4005, PHY2010, 3007, 3201, 4001, 4221選修三至四科	8-12
合共 (主修要求包括學院課程):		72

## Course List

### I. School Package for the School of Science and Engineering

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
Option A*	MAT1001	Calculus I	微積分（一）
	MAT1002	Calculus II	微積分（二）
Option B*	MAT1003	Mathematical Analysis I	數學分析（一）
	MAT1004	Mathematical Analysis II	數學分析（二）
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 must complete either Option A or Option B.

### II. Major Required Courses

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
CHM1002	Chemistry Laboratory	化學實驗	1
CHM2002	Physical Chemistry	物理化學	3
ENE3001	Principles of Energy Engineering	能源工程原理	3
ENE3002	Energy Science and Engineering Laboratory	能源科學與工程實驗	2
ENE3050	Electrical Power Systems	電力系統	3
ENE4003	Energy Conversion Processes	能量轉換過程	3
MAT2002	Ordinary Differential Equations	常微分方程	3
PHY1002	Physics Laboratory	物理實驗	2
PHY2001	Electricity and Magnetism	電磁學	3
PHY2002	Thermodynamics	熱力學	3
PHY3006	Physics of Semiconductors Devices	半導體器件物理	3

### III. Major Elective Courses

Course	Course Title (English)	Course Title (Chinese)	Unit(s)
CHM2001	Organic Chemistry	有機化學	3
CSC3002	Introduction to Computer Science: Programming Paradigms	計算機科學導論：程序設計範式	3

CSC3150	Operating System	操作系統	3
DDA2020*	Machine Learning	機器學習	3
ENE3003	Heat and Mass Transfer for Energy Systems	能源系統的熱質傳輸	3
ENE3004	Design of Solar Energy Conversion Systems	太陽能轉換系統設計	3
ENE3005	Electrochemical Energy Conversion	電化學能量轉換	3
ENE3006	Materials for Energy Applications	能源應用材料	3
ENE4001	Green Engineering and Environmental Compliance	綠色工程及環境標準	3
ENE4002	Hydrogen and Fuel Cells	氫能與燃料電池	3
ENE4004	Wind and Hydropower Energy Conversion	風能與水電能源轉換	3
ENE4005	Energy Resources and the Environment	能源與環境	3
ENE4006	Electrical Machines and Power Electronics Laboratory	電氣機械與電力電子實驗	2
ENE4007	Energy Economics	能源經濟學	3
ENE4008	Power Electronics	電力電子	3
ENE4009	Power System Stability and Control	電力系統穩定性與控制	3
ENE4010	Power System Planning	電力系統規劃	3
ENE4011	Smart Grid	智能電網	3
ENE4012	Electricity Market	電力市場	3
ENE4013	Electrical Machines	電機學	3
MAT3007	Optimization	最優化	3
MAT3220*	Optimization II	最優化(二)	3
STA2002	Probability and Statistics II	概率及統計(二)	3
MSE3002	Microstructural Evolution in Materials	材料微觀結構的演變	3
MSE3007	Electronic, Optical, and Magnetic Properties of Materials	材料的電學、光學及磁學性質	3
MSE3009	Introduction to Ceramics	陶瓷導論	3
MSE4003	Solid-State Electrochemistry	固態電化學	3
MSE4005	Nanoscale Materials	納米材料	3
PHY2010	Fluid Mechanics	流體力學	3
PHY3007	Optoelectronics	光電子學	3
PHY3201	Quantum Physics	量子物理	3
PHY4001	Solid-State Physics	固態物理學	3
PHY4221	Quantum Mechanics	量子力學	3

\* 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，科目代碼及名稱分別為「DDA2020」及「機器學習」。

\* The course title of MAT3220 is Operations Research for students who study the courses in 2015, 2016 and 2017. For students who study MAT3220 from 2018-19 term 1, the course title is Optimization II.

在 2015，2016及2017 學年修讀 MAT3220，科目名稱為「運籌學」。在 2018 學年第一学期及以後修讀 MAT3220，科目名稱為最優化（二）。