

(Study Scheme - English)

Programme Title

New Energy Science and Engineering

Study Scheme

Applicable to students admitted in 2022-23 and 2023-24

Major Programme Requirement

Studies in New Energy Science and Engineering are divided into TWO main streams and students are required to specialize in one of the streams:

- (1) New Energy Science; and
- (2) New Energy Engineering

New Energy Science Stream

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

	Units
1. School Package:	
CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001	22
2. Required Courses:	
CHM1002, 2002, 3520, ENE3002, 3004, 3005, 3006, 4003, ERG4901, PHY1002, 2001, 3007	32
3. Elective Courses:	
18 units of courses selected from the following:	18
BIO1001, CHM2110, 2210, 2310, 3540, ECE2001, 3001, EIE3250, ENE3001, 3003, 3050, 4001, 4005, 4007, 4008, 4009, 4010, 4011, 4012, 4013, ERG2050, 4902, MSE3002, 3007, 4005, 4570, PHY2002, 2010, 3002, 4002, MAT2002, 3007, 3220, STA2002	
Total:	72

New Energy Engineering Stream

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

	Units
1. School Package: CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001	22
2. Required Courses: ECE1810, 2001, 3001, ENE3002, 3050, 4003, 4008, ERG4901, MAT2002, PHY1002, 2001, STA2002	32
3. Elective Courses: 18 units of courses selected from the following: BIO1001, CHM2002, 2310, ECE3040, EIE3250, ENE3001, 3003, 3004, 3005, 3006, 4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG4902, MSE3002, 3007, 4005, PHY2002, 2010, 3002, 3007, 4002, CSC3002, 3150, DDA3020, ERG2050, MAT3007, 3220, STA4001	18
Total:	72

Notes:

- [a] Students can choose to take either MAT2040 or MAT2042 to fulfill the graduation requirement.
- [b] Students can choose to take either STA2001 or STA2001H to fulfill the graduation requirement.
- [c] Students can choose to take either CSC1001 and CSC1002 or CSC1003 and CSC1004 to fulfill the graduation requirement.
- [d] 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

二〇二二至二三年度及以後入學學生適用

主修課程要求

本課程分設兩項專修範圍，學生須選修其中一項專修範圍：

- (1) 新能源科學；及
- (2) 新能源工程。

新能源科學專修範圍

學生須至少修畢以下科目共 72 學分：

	學分
1. 學院課程：	
CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001	22
2. 必修科目：	
CHM1002, 2002, 3520, ENE3002, 3004, 3005, 3006, 4003, ERG4901, PHY1002, 2001, 3007	32
3. 選修科目：	
從以下選修 18 學分：	18
BIO1001, CHM2110, 2210, 2310, 3540, ECE2001, 3001, EIE3250, ENE3001, 3003, 3050, 4001, 4005, 4007, 4008, 4009, 4010, 4011, 4012, 4013, ERG2050, 4902, MSE3002, 3007, 4005, 4570, PHY2002, 2010, 3002, 4002, MAT2002, 3007, 3220, STA2002	
共：	<hr/> 72

新能源工程專修範圍

學生須至少修畢以下科目共 72 學分：

	學分
1. 學院課程： CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001	22
2. 必修科目： ECE1810, 2001, 3001, ENE3002, 3050, 4003, 4008, ERG4901, MAT2002, PHY1002, 2001, STA2002	32
3. 選修科目： 從以下選修 18 學分：	18
BIO1001, CHM2002, 2310, ECE3040, EIE3250, ENE3001, 3003, 3004, 3005, 3006, 4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG4902, MSE3002, 3007, 4005, PHY2002, 2010, 3002, 3007, 4002, CSC3002, 3150, DDA3020, ERG2050, MAT3007, 3220, STA4001	
共：	<hr/> 72

註：

- [a] 學生可以修讀 MAT2040 或 MAT2042 以滿足畢業要求。
- [b] 學生可以修讀 STA2001 或 STA2001H 以滿足畢業要求。
- [c] 學生可以修讀 CSC1001, CSC1002 或 CSC1003, CSC1004 以滿足畢業要求。
- [d] 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

- 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>New Energy Science and Engineering</u>		
	Recommended Course Pattern	Units
First Year of Attendance	1 st term School Package: CHM1001, CSC1001(or CSC1003), MAT1001	9
	2 nd term School Package: CSC1002(or CSC1004), MAT1002, MAT2040(or MAT2042), PHY1001	10
Second Year of Attendance	1 st term School Package: STA2001(or STA2001H) Major Required: CHM1002 ^[1] , 3520 ^[1] , ECE1810 ^[2] , 2001 ^[2] , PHY1002	3 6
	2 nd term Major Required: ENE3005 ^[1] , MAT2002 ^[2] , PHY2001	6
Third Year of Attendance	1 st term Major Required: CHM2002 ^[1] , ENE3004 ^[1] , 3050 ^[2] , 4008 ^[2] , STA2002 ^[2] Major Elective(s): one course	6-9 3
	2 nd term Major Required: ECE3001 ^[2] , ENE3002, 3006 ^[1] , PHY3007 ^[1] Major Elective(s): one to two course(s)	5-8 3-6
Fourth Year of Attendance	1 st term Major Required: ENE4003, ERG4901 Major Elective(s): one to two course(s)	6 3-6
	2 nd term Major Elective(s): one to three course(s)	3-9
Total (Major Requirement including School Package):		72

Explanatory Notes:

[1] Applicable to New Energy Science Stream only.

[2] Applicable to New Energy Engineering Stream only.

(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。

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, CSC1001(or CSC1003), MAT1001	9
	第二學期 學院課程: CSC1002(or CSC1004), MAT1002, MAT2040(or MAT2042), PHY1001	10
第二修業學年	第一學期 學院課程: STA2001(or STA2001H) 主修必修科目: CHM1002 ^[1] , 3520 ^[1] , ECE1810 ^[2] , 2001 ^[2] , PHY1002	3 6
	第二學期 主修必修科目: ENE3005 ^[1] , MAT2002 ^[2] , PHY2001	6
第三修業學年	第一學期 主修必修科目: CHM2002 ^[1] , ENE3004 ^[1] , 3050 ^[2] , 4008 ^[2] , STA2002 ^[2] 主修選修科目: 一科選修科目	6-9 3
	第二學期 主修必修科目: ECE3001 ^[2] , ENE3002, 3006 ^[1] , PHY3007 ^[1] 主修選修科目: 一至兩科選修科目	5-8 3-6
第四修業學年	第一學期 主修必修科目: ENE4003, ERG4901 主修選修科目: 一至兩科選修科目	6 3-6
	第二學期 主修選修科目: 一至三科選修科目	3-9
合共 (主修要求包括學院課程):		72

註：

[1] 只適用於新能源科學專修範圍。

[2] 只適用於新能源工程專修範圍。

Course List

I. School Package for the School of Science and Engineering

Course Code		Course Title (English)	Course Title (Chinese)	Unit(s)
CHM1001		General Chemistry	普通化學	3
Option C [#]	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 D [#]	CSC1003	Introduction to Computer Science and Java Programming	計算機科學與 Java 程序設計導論	3
	CSC1004	Computational Laboratory Using Java	Java 程序設計實驗	1
MAT1001		Calculus I	微積分（一）	3
MAT1002		Calculus II	微積分（二）	3
Option A [#]	MAT2040	Linear Algebra	線性代數	3
Option B [#]	MAT2042*	Honours Linear Algebra	線性代數榮譽課程	3
PHY1001		Mechanics	力學	3
Option E [#]	STA2001	Probability and Statistics I	概率及統計（一）	3
Option F [#]	STA2001H*	Honours Probability and Statistics I	概率及統計榮譽課程（一）	3

[#] Remark:

1. Students can choose to take either Option A or Option B to fulfill the graduation requirement.
2. Students can choose to take either Option C or Option D to fulfill the graduation requirement.
3. Students can choose to take either Option E or Option F to fulfill the graduation requirement.

II. Major Required courses

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
CHM1002 ^[1]	Chemistry Laboratory	化學實驗	1
CHM2002 ^[1]	Physical Chemistry	物理化學	3
CHM3520 ^[1]	Introduction to Materials Science and Engineering	材料科學與工程導論	3
ECE1810 ^[2]	Electronic Circuit Design Laboratory	電子線路設計實驗	1
ECE2001 ^[2]	Basic Circuit Theory	基本電路理論	3
ECE3001 ^[2]	Signals and Systems	信號與系統	3
ENE3002	Energy Science and Engineering Laboratory	能源科學與工程實驗	2
ENE3004 ^[1]	Design of Solar Energy Conversion Systems	太陽能轉換系統設計	3
ENE3005 ^[1]	Electrochemical Energy Conversion	電化學能量轉換	3
ENE3006 ^[1]	Materials for Energy Applications	能源應用材料	3
ENE3050 ^[2]	Electrical Power Systems	電力系統	3
ENE4003	Energy Conversion Processes	能量轉換過程	3
ENE4008 ^[2]	Power Electronics	電力電子	3
ERG4901*	Capstone Project I	畢業設計（一）	3
MAT2002 ^[2]	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

PHY3007 ^[1]	Optoelectronics	光電子學	3
STA2002 ^[2]	Probability and Statistics II	概率及統計（二）	3

III. Major Elective courses

Course Code	Course Title (English)	Course Title (Chinese)	Unit(s)
BIO1001	General Biology	普通生物學	3
CHM2002 ^[2]	Physical Chemistry	物理化學	3
CHM2110 ^[1]	Analytical Chemistry	分析化學	3
CHM2210 ^[1]	Inorganic Chemistry	無機化學	3
CHM2310*	Organic Chemistry I	有機化學（一）	3
CHM3540 ^[1]	Introduction to Functional Materials	功能材料導論	3
CSC3002 ^{[2]*}	C/C++ Programming	C/C++程序設計	3
CSC3150 ^[2]	Operating System	操作系統	3
DDA3020* ^[2]	Machine Learning	機器學習	3
ECE2001 ^[1]	Basic Circuit Theory	基本電路理論	3
ECE3001 ^[1]	Signals and Systems	信號與系統	3
ECE3040	Introduction to Linear Systems	線性系統導論	3
EIE3250	System & Control	系統與控制	3
ENE3001	Principles of Energy Engineering	能源工程原理	3
ENE3003	Heat and Mass Transfer for Energy Systems	能源系統的熱質傳輸	3
ENE3004 ^[2]	Design of Solar Energy Conversion Systems	太陽能轉換系統設計	3
ENE3005 ^[2]	Electrochemical Energy Conversion	電化學能量轉換	3
ENE3006 ^[2]	Materials for Energy Applications	能源應用材料	3
ENE3050 ^[1]	Electrical Power Systems	電力系統	3
ENE4001	Green Engineering and Environmental Compliance	綠色工程及環境標準	3
ENE4005	Energy Resources and the Environment	能源與環境	3
ENE4007	Energy Economics	能源經濟學	3
ENE4008 ^[1]	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
ERG2050*	Introduction to Data Analytics	數據解析導論	3
ERG4902*	Capstone Project II	畢業設計（二）	3
MAT2002 ^[1]	Ordinary Differential Equations	常微分方程	3
MAT3007	Optimization	最優化	3
MAT3220*	Optimization II	最優化（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
MSE4005	Nanoscale Materials	納米材料	3

MSE4570 ^[1]	Semi-conductors and Devices	半導體與器件	3
PHY2002	Thermodynamics	熱力學	3
PHY2010	Fluid Mechanics	流體力學	3
PHY3002*	Electrodynamics I	電動力學 (一)	3
PHY3007 ^[2]	Optoelectronics	光電子學	3
PHY4002	Electrodynamics II	電動力學 (二)	3
STA2002 ^[1]	Probability and Statistics II	概率及統計 (二)	3
STA4001 ^[2]	Stochastic Processes	隨機過程	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 學年第一学期前修讀 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 2018-19 學年第一学期及以後修讀 MAT3220，科目名稱為最優化 (二)。

* The Chinese course title of ERG2050 is 數據分析導論 for students who study the courses in 2015, 2016, 2017 and 2018. For students who study ERG2050 from 2019-20 term 1, the Chinese course title is 數據解析導論.

在 2015, 2016, 2017 及 2018 學年修讀 ERG2050，科目名稱為「數據分析導論」。在 2019-20 學年第一学期及以後修讀 ERG2050，科目名稱為「數據解析導論」。

* The course title of CHM2001 is Organic Chemistry and credit is 3 units for students who study the course before 2021-2022 term 2. For students who study this course from 2021-2022 term 2, the course code is CHM2310, the course title is Organic Chemistry I and credit is 3 units.

在 2021-22 學年第二學期前修讀 CHM2001，科目名稱為「有機化學」，學分為 3 分。在 2021-22 學年第二學期及以後修讀該科目，科目代碼及名稱為 CHM2310「有機化學 (一)」，學分為 3 分

* The course code of Machine Learning is DDA2020 for students who study the course before 2022-23 term 1. For students who study this course from 2022-23 term 1, the course code is DDA3020.

在 2022-23 學年第一学期前修讀「機器學習」，科目代碼為 DDA2020。在 2022-23 學年第一學期及以後修讀該科目，科目代碼為「DDA3020」。

* The course title of ERG4901 is Final Year Project I for students who study the course before 2022-23 term 2. For students who study this course from 2022-23 term 2, the course title is Capstone Project I.

在 2022-23 學年第二學期前修讀 ERG4901，科目名稱為「Final Year Project I 畢業設計 (一)」。
在 2022-23 學年第二學期及以後修讀該科目，科目名稱為「Capstone Project I 畢業設計 (一)」。

* The course title of ERG4902 is Final Year Project II for students who study the course before 2022-23 term 2. For students who study this course from 2022-23 term 2, the course title is Capstone Project II.

在 2022-23 學年第二学期前修讀 ERG4902，科目名稱為「Final Year Project II 畢業設計(二)」。
在 2022-23 學年第二学期及以後修讀該科目，科目名稱為「Capstone Project II 畢業設計(二)」。

* 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」。

* The course title of PHY3002 is Electrodynamics for students who study the course before 2023-24 term 1. For students who study this course from 2023-24 term 1, the course title is Electrodynamics I.
在 2023-24 學年第一学期前修讀 PHY3002，科目名稱為「電動力學」。在 2023-24 學年第一学期及以後修讀該科目，科目名稱為「電動力學(一)」。

* The course title of MAT2042 is Linear Algebra I for students who study the course before 2023-24 term 1. For students who study this course from 2023-24 term 1, the course title is Honours Linear Algebra.

在 2023-24 學年第一学期前修讀 MAT2042，科目名稱為「線性代數(一)」。
在 2023-24 學年第一学期及以後修讀該科目，科目名稱為「線性代數榮譽課程」。

* The course title of STA2003 is Probability for students who study the course before 2024-25 term 1. For students who study this course from 2024-25 term 1, the course code is STA2001H and the title is Honours Probability and Statistics I.

在 2024-25 學年第一学期前修讀 STA2003，科目名稱為「概率論基礎」。在 2024-25 學年第一学期及以後修讀該科目，科目代號及名稱分別為「STA2001H」及「概率及統計榮譽課程(一)」。