

**(Study Scheme - English)**

**Programme Title**

New Energy Science and Engineering

**Study Scheme**

**Applicable to students admitted in 2021-22**

**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:   |           |
| BIO1001, CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001   | 25        |
| 2. Required Courses:   |           |
| CHM1002, 2002, 3520, ENE3002, 3006, 4003, 4008, ERG4901, MAT2002, PHY1002, 2001, 3007  | 32        |
| 3. Elective Courses:   |           |
| 15 units of courses selected from the following:   | 15        |
| CHM2110, 2210, 2310, 3540, EIE2001, 3001, 3250, ENE3001, 3003, 3004, 3005, 3050, 4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG2050, 4902, MSE3002, 3007, 4005, 4570, PHY2002, 2010, 3002, 4002, MAT3007, 3220, STA2002 |           |
| <b>Total:</b>  | <b>72</b> |

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.

## New Energy Engineering Stream

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

|  | Units     |
|--|-----------|
| 1. School Package:<br>BIO1001, CHM1001, CSC1001, 1002, MAT1001, 1002, 2040,<br>STA2001, PHY1001  | 25        |
| 2. Required Courses:<br>EIE1810, 2001, 3001, ENE3002, 3050, 4003, 4008, ERG4901,<br>MAT2002, PHY1002, 2001, STA2002  | 32        |
| 3. Elective Courses:<br>15 units of courses selected from the following:<br>CHM2002, 2310, ECE3040, ENE3001, 3003, 3004, 3005, 3006,<br>4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG4902,<br>MSE3002, 3007, 4005, PHY2002, 2010, 3002, 3007, 4002,<br>CSC3002, 3150, DDA3020, EIE3250, ERG2050, MAT3007, 3220,<br>STA4001 | 15        |
| <b>Total:</b>  | <b>72</b> |

### 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

新能源科學與工程

修讀辦法

二〇二一至二二年度入學學生適用

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：   |           |
| BIO1001, CHM1001, CSC1001, 1002, MAT1001, 1002, 2040, STA2001, PHY1001   | 25        |
| 2. 必修科目：   |           |
| CHM1002, 2002, 3520, ENE3002, 3006, 4003, 4008, ERG4901, MAT2002, PHY1002, 2001, 3007  | 32        |
| 3. 選修科目：   |           |
| 從以下選修 15 學分：   | 15        |
| CHM2110, 2210, 2310, 3540, EIE2001, 3001, 3250, ENE3001, 3003, 3004, 3005, 3050, 4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG2050, 4902, MSE3002, 3007, 4005, 4570, PHY2002, 2010, 3002, 4002, MAT3007, 3220, STA2002 |           |
| 共：   | <u>72</u> |

註：

- [a] 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。

## 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：<br>BIO1001, CHM1001, CSC1001, 1002, MAT1001, 1002, 2040,<br>STA2001, PHY1001  | 25 |
| 2. 必修科目：<br>EIE1810, 2001, 3001, ENE3002, 3050, 4003, 4008, ERG4901,<br>MAT2002, PHY1002, 2001, STA2002  | 32 |
| 3. 選修科目：<br>從以下選修 15 學分：<br>CHM2002, 2310, ECE3040, ENE3001, 3003, 3004, 3005, 3006,<br>4001, 4005, 4007, 4009, 4010, 4011, 4012, 4013, ERG4902,<br>MSE3002, 3007, 4005, PHY2002, 2010, 3002, 3007, 4002,<br>CSC3002, 3150, DDA3020, EIE3250, ERG2050, MAT3007, 3220,<br>STA4001 | 15 |

共： 72

註：

- [a] 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

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.

| <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<br>School Package: CHM1001, MAT1001, PHY1001  | 9            |
|   | 2 <sup>nd</sup> term<br>School Package: CSC1001, 1002, MAT1002, STA2001  | 10           |
| <b>Second Year of Attendance</b>  | 1 <sup>st</sup> term<br>School Package: MAT2040<br>Major Required: CHM1002 <sup>[1]</sup> , 3520 <sup>[1]</sup> , EIE1810 <sup>[2]</sup> , 2001 <sup>[2]</sup> , PHY1002 | 3<br>6       |
|   | 2 <sup>nd</sup> term<br>School Package: BIO1001<br>Major Required: MAT2002, PHY2001  | 3<br>6       |
| <b>Third Year of Attendance</b>   | 1 <sup>st</sup> term<br>Major Required: CHM2002 <sup>[1]</sup> , ENE3050 <sup>[2]</sup> , 4008, STA2002 <sup>[2]</sup><br>Major Elective(s): one course                  | 6-9<br>3     |
|   | 2 <sup>nd</sup> term<br>Major Required: PHY3007 <sup>[1]</sup> , EIE3001 <sup>[2]</sup> , ENE3002, 3006 <sup>[1]</sup><br>Major Elective(s): one to two course(s)        | 5-8<br>3-6   |
| <b>Fourth Year of Attendance</b>  | 1 <sup>st</sup> term<br>Major Required: ENE4003, ERG4901<br>Major Elective(s): one to two course(s)  | 6<br>3-6     |
|   | 2 <sup>nd</sup> term<br>Major Elective(s): one to three course(s)  | 3-9          |
| <b>Total (Major Requirement including School Package):</b>                      |  | <b>72</b>    |

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<br>學院課程: CHM1001, MAT1001, PHY1001  | 9          |
|                  | 第二學期<br>學院課程: CSC1001, 1002, MAT1002, STA2001  | 10         |
| 第二修業學年           | 第一學期<br>學院課程: MAT2040<br>主修必修科目: CHM1002 <sup>[1]</sup> , 3520 <sup>[1]</sup> , EIE1810 <sup>[2]</sup> , 2001 <sup>[2]</sup> , PHY1002 | 3<br>6     |
|                  | 第二學期<br>學院課程: BIO1001<br>主修必修科目: MAT2002, PHY2001  | 3<br>6     |
| 第三修業學年           | 第一學期<br>主修必修科目: CHM2002 <sup>[1]</sup> , ENE3050 <sup>[2]</sup> , 4008, STA2002 <sup>[2]</sup><br>主修選修科目: 一科選修科目                       | 6-9<br>3   |
|                  | 第二學期<br>主修必修科目: PHY3007 <sup>[1]</sup> , EIE3001 <sup>[2]</sup> , ENE3002, 3006 <sup>[1]</sup><br>主修選修科目: 一至兩科選修科目                     | 5-8<br>3-6 |
| 第四修業學年           | 第一學期<br>主修必修科目: ENE4003, ERG4901<br>主修選修科目: 一至兩科選修科目   | 6<br>3-6   |
|                  | 第二學期<br>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) |
|-------------|---|------------------------|---------|
| 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       |
| 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) |
|------------------------|---|------------------------|---------|
| CHM1002 <sup>[1]</sup> | Chemistry Laboratory                              | 化學實驗                   | 1       |
| CHM2002 <sup>[1]</sup> | Physical Chemistry                                | 物理化學                   | 3       |
| CHM3520 <sup>[1]</sup> | Introduction to Materials Science and Engineering | 材料科學與工程導論              | 3       |
| EIE1810 <sup>[2]</sup> | Electronic Circuit Design Laboratory              | 電子線路設計實驗               | 1       |
| EIE2001 <sup>[2]</sup> | Basic Circuit Theory                              | 基本電路理論                 | 3       |
| EIE3001 <sup>[2]</sup> | 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       |
| ENE3006 <sup>[1]</sup> | Materials for Energy Applications                 | 能源應用材料                 | 3       |
| ENE3050 <sup>[2]</sup> | Electrical Power Systems                          | 電力系統                   | 3       |
| ENE4003                | Energy Conversion Processes                       | 能量轉換過程                 | 3       |
| ENE4008                | Power Electronics                                 | 電力電子                   | 3       |
| ERG4901*               | Capstone Project I                                | 畢業設計（一）                | 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       |
| PHY3007 <sup>[1]</sup> | Optoelectronics                                   | 光電子學                   | 3       |
| STA2002 <sup>[2]</sup> | 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) |
|------------------------|------------------------|------------------------|---------|
| CHM2002 <sup>[2]</sup> | Physical Chemistry     | 物理化學                   | 3       |
| CHM2110 <sup>[1]</sup> | Analytical Chemistry   | 分析化學                   | 3       |
| CHM2210 <sup>[1]</sup> | Inorganic Chemistry    | 無機化學                   | 3       |

|                         |   |               |   |
|-------------------------|---|---------------|---|
| CHM2310*                | Organic Chemistry I                                       | 有機化學 (一)      | 3 |
| CHM3540 <sup>[1]</sup>  | Introduction to Functional Materials                      | 功能材料導論        | 3 |
| CSC3002 <sup>[2]*</sup> | C/C++ Programming   | C/C++程序設計     | 3 |
| CSC3150 <sup>[2]</sup>  | Operating System  | 操作系統          | 3 |
| DDA3020* <sup>[2]</sup> | Machine Learning  | 機器學習          | 3 |
| ECE3040                 | Introduction to Linear Systems                            | 線性系統導論        | 3 |
| EIE2001 <sup>[1]</sup>  | Basic Circuit Theory                                      | 基本電路理論        | 3 |
| EIE3001 <sup>[1]</sup>  | Signals and Systems                                       | 信號與系統         | 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                 | 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 <sup>[2]</sup>  | Materials for Energy Applications                         | 能源應用材料        | 3 |
| ENE3050 <sup>[1]</sup>  | 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 |
| ENE4009                 | Power System Stability and Control                        | 電力系統穩定性与控制    | 3 |
| ENE4010                 | Power System Planning                                     | 電力系統规划        | 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 |
| 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 <sup>[1]</sup>  | 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 <sup>[2]</sup>  | Optoelectronics   | 光電子學          | 3 |
| PHY4002                 | Electrodynamics II  | 電動力學 (二)      | 3 |
| STA2002 <sup>[1]</sup>  | Probability and Statistics II                             | 概率及統計 (二)     | 3 |
| STA4001 <sup>[2]</sup>  | 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 學年第二學期前修讀 ERG4902，科目名稱為「Final Year Project II 畢業設計（二）」。  
在 2022-23 學年第二學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 學年第二學期前修讀 CSC3002，科目名稱為「計算機科學導論：程序設計範式」。  
在 2022-23 學年第二學期及以後修讀 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 學年第二學

期及以後修讀該科目，科目名稱為「電動力學（一）」。