

THE HONG KONG POLYTECHNIC UNIVERSITY



DEPARTMENT OF APPLIED PHYSICS

PROGRAMME REQUIREMENT DOCUMENT

OF

BACHELOR OF SCIENCE (HONOURS) IN ENGINEERING PHYSICS

(Code: 11439)

4-year curriculum intake cohort 2021/22

Version: Sep 2021

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1. GENERAL INFORMATION

| | |
|-----------------------------|---|
| Programme Title | : Bachelor of Science (Honours) in Engineering Physics [BSc (Hons) in EP] |
| Programme Code | : 11439 |
| Host Department | : Department of Applied Physics |
| Medium of Instruction | : English |
| Mode of Study | : Full-time |
| Duration | : 4 years (normal) |
| Entry Qualification | : HKDSE (Hong Kong Diploma of Secondary Education) or equivalent |
| Requirements for Graduation | : <ul style="list-style-type: none"> • At least 125 credits (Depending on the student's attainment of HKDSE) • University Graduation Requirements |
| Final Award | : BSc (Hons) in Engineering Physics 工程物理學(榮譽)理學士學位 |
| Annual Intake Number | : 25 |

2. STUDY ROUTE OPTIONS

“Single Discipline Major” Route

Students in this route will normally pursue four years of full-time study and graduate with an award of BSc (Hons) in EP after having satisfied all Programme requirements and University graduation requirements. Details about the single discipline major programme of BSc (Hons) in EP are given in later sections.

“Major/Minor” Route

For the graduation requirements of specific programmes of study (majors and minors), candidates should refer to the relevant section of AR website or consult the programme-offering departments concerned.

3. OBJECTIVES AND PROGRAMME OUTCOMES

3.1 Objectives

The principal aim of the Programme is to provide a programme of study at Honours Degree level, which will produce graduate physicists with a knowledge

of applied physics and of one or more areas of engineering appropriate to the needs of the employment sector requiring graduates who combine a balance of generic skills, a broad scientific base and a technical bias.

3.2 Programme outcomes

The Programme should lead to the following two categories of learning outcomes, referring to the intellectual abilities, knowledge, skills and attributes that an all-round preferred graduate should possess. These learning outcomes also correlate to the University's Institutional Learning Outcomes for Undergraduate Programmes (UILO)¹, as indicated below.

3.2.1 Category A Professional/academic knowledge and skills

The graduates should be able to:

| | |
|----|---|
| A1 | apply principles and laws in physics and in the selected area(s) of engineering to analyze scientific and technical/technological problems, particularly those at the interface between physics and engineering; |
| A2 | apply the principles, methodologies and skills for experimental observation and interpretation for scientific and engineering purposes, especially in modern instrumentation, and materials science and technology; |
| A3 | formulate scientific and engineering problems in suitable mathematical or computable forms, and be able to make good judgement on the appropriateness of approximations and the derived results/answers; |
| A4 | assimilate and implement new ideas resourcefully, so as to demonstrate entrepreneurial spirits and skills, and become more flexible and adaptable to function in different employment environments and to cope with advance and change; and |
| A5 | develop a career in various professions, by making use of the broad-based foundation, and insights towards global trends and opportunities, acquired in the study. |

Learning Outcomes in this Category correlate with the UILO of 'Competent professional'.

¹ https://www.polyu.edu.hk/obe/02_2_Intended_Learning_Outcomes_for_PolyU_Graduates.php

3.2.2 Category B Attributes for all-roundedness

PolyU aspires to develop all its students as all-round graduates with professional competence, and has identified a set of highly valued graduates attributes as the learning goals for students.

The graduates should (or are expected to) possess the following attributes:

| Outcomes | Attributes | UILOs* |
|----------|--|---------|
| B1 | be able to examine and critique the validity of information, arguments and different viewpoints, and to evaluate, synthesize and propose solutions to problems of a general nature based on logical reasoning, with innovative/creative ideas where appropriate; | CT/ IPS |
| B2a | be able to communicate clearly and effectively in English; | EC |
| B2b | be able to communicate clearly and effectively in Chinese, including Cantonese and Putonghua; | |
| B3 | be able to collaborate smoothly with others as a leader or a team player, to demonstrate a sense of responsibility, accountability, team relationship and spirit, and ethical reasoning in professional and day-to-day contexts; | EL |
| B4 | possess a desire for life-long learning and self-learning; and | LL |
| B5 | possess an understanding of different cultures and social development needs in local, national, and global contexts, and accept the responsibilities as professionals and citizens in such contexts. | SRGC |

* *CT: Critical thinker; EC: Effective communicator; IPS: Innovative problem solver; LL: Lifelong learner; EL: Ethical leader; SRGC: Socially responsible global citizen.*

Learning Outcomes in this Category map to the UILOs of ‘Critical thinker’, ‘Effective communicator’, ‘Innovative problem solver’, ‘Lifelong learner’, ‘Ethical leader’ and ‘Socially responsible global citizen’ as indicated in the table above.

While many of these graduate attributes can be developed through the curricular activities of this Programme, some (including communication skills, leadership and global outlook) are primarily addressed through co-curricular activities offered by faculties, departments, and various teaching and learning support units of the University. Students are encouraged to make full use of such opportunities to develop these attributes.

These outcomes will be achieved by using different teaching/learning methods and various assessment tools as well as a set of criterion-referenced assessment grades in each subject. Detailed subject syllabuses and assessment schemes are given in Appendix I.

4. ENTRANCE REQUIREMENTS

For those applying on the basis of HKDSE:

Four core subjects and one elective subject with:

Level 3: English Language and Chinese Language

Level 2: Mathematics, Liberal Studies and one elective subject

Preference will be given to: a single physics subject/combined science with physics component.

5. THE CREDIT-BASED PROGRAMME

- 5.1 The Programme is operated under the credit-based system of the University and subject to the regulations of the system. This system provides flexibility in the curriculum as well as in the pace with which students can progress through the Programme.
- 5.2 Under the credit-based system, the University academic year consists of two teaching semesters, each of 13 weeks, plus a Summer Term of 7 weeks' duration. There are two weeks at the end of each semester and one week at the end of the Summer Term for examination purposes.
- 5.3 Each subject of the Programme has a value expressed in terms of credits. A grade point system is used for subject assessment. The Grade Point Average (GPA) is a measure of the overall performance of the subjects accumulated (see "Grading" sections).

6. CURRICULUM OF FULL-TIME BSC(HONS) IN ENGINEERING PHYSICS

| Stage/ Semester | Subject Code | Subject | Credit | Compulsory/ Elective | Pre- requisite |
|--------------------|--------------|--|--------------|-------------------------|-------------------|
| 1/1 | AP10005 | Physics I [#] | 3 | C | |
| 1/1 | ABCT1101 | Introductory Life Science [#] | 3 | C | |
| 1/1 | ABCT1700 | Introduction to Chemistry [#] | 3 | C | |
| | ABCT1102 | General Biology [#] | 3 | C | |
| | ABCT1741 | General Chemistry I [#] | 3 | C | |
| 1/1 | AMA1007 | Calculus and Linear Algebra [#] | 3 | C | |
| 1/1 | AP10000 | Freshman Seminar – From Atoms to The Universe (GUR) | 3 | C | |
| 1/1 | | English I (GUR) | 3 | C | |
| | | Credits for Year 1, Semester 1 | 15-18 | | |
| 1/2 | AP10007 | Applied Physics Laboratory | 3 | C | |
| 1/2 | AP10006 | Physics II [#] | 3 | C | |
| 1/2 | AMA1006 | Basic Statistics [#] | 2 | C | |
| 1/2 | | English II (GUR) | 3 | C | |
| 1/2 | | Chinese (GUR) | 3 | C | |
| 1/2 | | Leadership and Intra-Personal Development (GUR) | 3 | C | |
| 1/2 | | Healthy Lifestyle | 0 | C | |
| | | Credits for Year 1, Semester 2 | 17 | | |
| 2/1 | AP20001 | Electromagnetism | 3 | C | AP10006 |
| 2/1 | AP20003 | Mechanics | 3 | C | AP10005 |
| 2/1 | AP20007 | Fundamentals of Scientific Instrumentation | 3 | C | |
| 2/1 | AMA2882 | Mathematics for Scientists and Engineers | 4 | C | |
| 2/1 | | CAR I (GUR) | 3 | C | |
| | | Credits for Year 2, Semester 1 | 16 | | |
| 2/2 | AP20002 | Materials Science | 3 | C | |
| 2/2 | AP20005 | Programming in Physics | 3 | C | |
| 2/2 | AP20006 | Quantum Mechanics for Scientists and Engineers | 3 | C | AP10006 |
| 2/2 | AP20008 | Waves | 3 | C | AP10006 |
| 2/2 | | CAR II (GUR) | 3 | C | |
| 2/2 | CLC2211P | Chinese Communication for Science Professionals | 2 | C | |
| | | Credits for Year 2, Semester 2 | 17 | | |
| 3/1 | AP30012 | Thermal and Statistical Physics | 3 | C | AP20006 |
| 3/1 | | CAR III (GUR) | 3 | C | |
| 3/1 | ELC3121 | English for Scientific Communication (DSR Language) | 2 | C | LCR English |
| 3/1 | | 3 Electives ⁺ | 9 | E | |
| | | Credits for Year 3, Semester 1 | 17 | | |
| 3/2 | AP30011 | Solid State Physics | 3 | C | AP20006 |
| 3/2 | | Service-Learning (GUR) | 3 | C | |
| 3/2 | | 3 Electives ⁺ | 9 | E | |
| | | Credits for Year 3, Semester 2 | 15 | | |
| 4/1 | AP40004 | Project (yearly subject) | 2 | C | |
| 4/1 | | CAR IV (GUR) | 3 | C | |
| 4/1 | | 3 Electives ⁺ | 9 | E | |
| | | Credits for Year 4, Semester 1 | 14 | | |
| 4/2 | AP40004 | Project (yearly subject) | 2 | C | |
| 4/2 | | 3 Electives ⁺ | 9 | E | |
| | | Credits for Year 4, Semester 2 | 11 | | |
| | | Total: | 125 | | |

Remarks:

GUR - General University Requirements (please refer to p. 17)

CAR - Cluster Areas Requirement (please refer to p. 17 and Appendix V)

LCR - Language and Communication Requirements (please refer to p.17 and Appendix IV)

DSR - Discipline Specific Requirements

Notes:

Common subjects for Applied Sciences programmes

| Broad Discipline common subjects | | Credit | Offered in Semester | |
|---|--|--------|---------------------|-------|
| Category A | B | | 1 | 2 |
| Physics I [AP10005] [#] | | 3 | A & B | |
| Physics II [AP10006] [#] | | 3 | A & B | |
| Introduction to Chemistry [ABCT1700] | <i>or</i> General Chemistry I [ABCT1741] | 3 | A&B | |
| Introductory Life Science [ABCT1101] | <i>or</i> General Biology [ABCT1102] | 3 | A&B | |
| Calculus & Linear Algebra [AMA1007]* | | 3 | A & B | |
| Basic Statistics [AMA1006]* | | 2 | A & B | |
| Underpinning subject | | Credit | Offered in Semester | |
| Foundation Mathematics [AMA1100] | | | 2 | 1 & 2 |
| * Students without Level 2 or above in HKDSE Mathematics Extended Module M1 or M2 will be required to take AMA1100 before taking AMA1006 and AMA1007. | | | | |
| Introduction to Physics [AP10001] | | 3 | 1 & 2 | |
| # Students who have not attained Level 3 or above in Physics as a single Science subject or a component of the Combined Science (sub-score) in HKDSE, will be required to take AP10001 before taking AP10005 & AP10006. | | | | |

1. All applied science & mathematics students are required to complete one broad discipline common subject each in Physics, Chemistry, Biology, Calculus & Linear Algebra and Basic Statistics.
2. The science subjects under Category A are designed for students who have not attained Level 3 or above in Chemistry and/or Biology as a single Science subject or a component of the Combined Science (sub-score) in HKDSE.
3. Students who have attained Level 3 or above in Chemistry and/or Biology, as a single Science subject or a component of the Combined Science (sub-score) are required to take the relevant subjects under Category B.
4. Students must retake a compulsory subject which they have failed. Those who fail Category B subjects and pursue for programmes which accept Category A subjects could take the relevant Category A subject as replacement. Academic Advisors will provide academic counseling to students on the appropriate subject to take/retake.
5. Students who have not achieved Level 2 or above in Extended Modules of Mathematics (M1 or M2) in HKDSE are required to complete AMA1100 before progressing to take

AMA1006 and AMA1007. AMA1100 is an underpinning subject. The 2 credits earned by students will not be counted towards the number of credits required for graduation.

6. Students who have not achieved Level 3 or above in Physics as a single Science subject or a component of the Combined Science (sub-score) in HKDSE, are required to complete AP10001 before progressing to take AP10005 & AP10006. AP10001 is an underpinning subject. The 3 credits earned by students will not be counted towards the number of credits required for graduation.
7. The Department will provide academic counseling to students upon their admission and before subject registration.

+ Students may take no more than 4 free elective subjects, with subject level 3 or above, from other departments.

Elective subjects offered by AP:

Under the normal programme pattern, students are recommended taking level 3 subjects in year 3 and level 4 subjects in year 4.

Elective subjects in Semester 1

- AP30001 Applied Acoustics <Pre-requisite: AP20003>
- AP30002 Computational Physics <Pre-requisite: AP20005>
- AP30009 Laser Principles and Applications *
- AP30013 Photonics Laboratory *
- AP30014 Science & Technology of Photovoltaics * <Pre-requisite: AP20006>
- AP30017 Medical Imaging: Science and Technology

- AP40001 Advanced Physics Laboratory <Pre-requisite: AP10007>
- AP40002 Display Technology *
- AP40011 Materials in Energy Conversion and Storage
- AP40012 Machine Learning in Physics <Pre-requisite: AP20005>

Elective subjects in Semester 2

- AP30003 Detectors and Imaging Devices * <Pre-requisite: AP20006>
- AP30004 Electromagnetic Fields <Pre-requisite: AP20001 and AP20008>
- AP30005 Advanced Scientific Instrumentation *
- AP30007 Optical Design *
- AP30010 Radiation Physics

- AP40003 Solid State Lighting *
- AP40005 Optoelectronic Packaging and Reliability *
- AP40006 Semiconductor Materials and Devices * <Pre-requisite: AP20002>
- AP40009 Advanced Photonics Laboratory* <Pre-requisite: AP30013>
- AP40010 Lighting Control Technology

*** Elective subjects for Optoelectronics stream**

Summary of the suggested credit distribution in each semester and each year

| Stage/Semester | Credits |
|--------------------|------------|
| Year 1, Semester 1 | 15-21 |
| Year 1, Semester 2 | 14-20 |
| Year 2, Semester 1 | 16 |
| Year 2, Semester 2 | 17 |
| Year 3, Semester 1 | 17 |
| Year 3, Semester 2 | 15 |
| Year 4, Semester 1 | 14 |
| Year 4, Semester 2 | 11 |
| Total | 125 |

Summary of the credit requirements for different subject areas

| | |
|---|---------------------------|
| (a) Language and Communication Requirements | 9 credits |
| (b) Freshman Seminar | 3 credits |
| (c) Leadership and Intra-Personal Development | 3 credits |
| (d) Service-Learning | 3 credits |
| (e) Cluster Areas Requirement (CAR) | 12 credits |
| (f) China Studies Requirement | (3 of the 12 CAR credits) |
| (g) Healthy Lifestyle | Non-credit bearing |
| (h) Discipline-Specific Requirement (DSR) | 95 credits |
| Total | 125 credits |

7. CURRICULUM MAP

This curriculum map gives a holistic view of the programme to which each intended learning outcome will be taught and assessed in the programme (see “Objectives” and “Programme outcomes” sections.)

The following indicators (I, R, A) in the relevant boxes show the treatment of the programme outcome in a subject:

I (Introduced) That the learning leading to the particular intended outcome is introduced in that subject.

R (Reinforced) That the learning leading to the particular intended outcome is reinforced in that subject.

A (Assessed) That the performance which demonstrates the particular intended outcome is assessed in that subject

| Subjects \ Programme outcomes | A1 | A2 | A3 | A4 | A5 | B1 | B2a | B2b | B3 | B4 | B5 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|
| AP10001 Introduction to Physics | A | | I | | | I | | | | I | |
| AP10005 Physics I | A | | I | | | I | | | | I | |
| AP10006 Physics II | A | | I | | | I | | | | I | |
| AP20001 Electromagnetism | A | | I | | | I | | | | | |
| AP20002 Materials Science | A | | I | | I | I | | | | | |
| AP20003 Mechanics | A | | I | | | I | | | | | |
| AP10007 Applied Physics Laboratory | A | A | I | | I | I | I | | I | I | |
| AP20005 Programming in Physics | | | A | | I | I | | | | I | |
| AP20006 Quantum Mechanics for Scientists and Engineers | A | | A | | | I | | | | | |
| AP20007 Fundamentals of Scientific Instrumentation | A | R/A | R/A | | I | | | | I | | |
| AP20008 Waves | A | | R | | | I | | | | | |
| AP30001 Applied Acoustics | A | R | R | | I | R | | | | | |
| AP30002 Computational Physics | A | R | A | | R | R | | | | | |
| AP30003 Detectors and Imaging Devices | A | A | | R | | | | | | | |
| AP30004 Electromagnetic Fields | R | | R | | | R | | | | | |
| AP30005 Advanced Scientific Instrumentation | A | R | | R | R | | | | R | | |
| AP30007 Optical Design | A | A | R | | R | R | | | | | |
| AP30009 Laser Principles and Applications | A | | R | | R | R | | | | | |
| AP30010 Radiation Physics | A | R | R | | R | R | | | | | |
| AP30011 Solid State Physics | A | | R | | | R | | | | | |
| AP30012 Thermal and Statistical Physics | A | | R | | | R | | | | | |
| AP30013 Photonics Laboratory | A | R | | R | R | R | | | | | |
| AP30014 Science & Technology of Photovoltaics | A | R | | R | R | R | | | | | |

| Programme outcomes | A1 | A2 | A3 | A4 | A5 | B1 | B2a | B2b | B3 | B4 | B5 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|
| Subjects | | | | | | | | | | | |
| AP30017 Medical Imaging: Science and Technology | A | R | R | | R | R | | | | R | |
| AP40001 Advanced Physics Laboratory | | A | | R/A | R | R | | | R | | |
| AP40002 Display Technology | A | A | | | R | R | | | | | |
| AP40003 Solid State Lighting | A | A | | | R | R | | | | | |
| AP40004 Project (yearly subject) | A | A | A | A | A | R/A | A | R | A | R | |
| AP40005 Optoelectronic Packaging and Reliability | A | A | | | R | R | | | | | |
| AP40006 Semiconductor Materials and Devices | A | A | | | R | R | | | | | |
| AP40009 Advanced Photonics Laboratory | | A | | R/A | R | R | | | R | | |
| AP40010 Lighting Control Technology | A | A | | | R | R | | | | | |
| AP40011 Materials in Energy Conversion and Storage | A | I | A | R | R | A | | | | I | |
| AP40012 Machine Learning in Physics | A | | R/A | A | R | A | | | | R | |
| AP10000 Freshmen Seminar – From Atoms to the Universe (GUR) | | | | | | | | | | I | I |
| English I (GUR) | | | | | | | A | | | I | |
| AMA1006 Basic Statistics | | I | I | | | | | | | | |
| AMA1007 Calculus and Linear Algebra | | I | I | | | | | | | | |
| AMA1100 Foundation Mathematics | | I | I | | | | | | | | |
| ABCT1101 Introductory Life Science | | | | | | I | | | | I | |
| ABCT1102 General Biology | | | | | | I | | | | I | |
| English II (GUR) | | | | | | | A | | | R | |
| CAR I (GUR) | | | | | | | | | | R | |
| ABCT1700 Introduction to Chemistry | | | | | | I | | | | I | |
| ABCT1741 General Chemistry I | | | | | | I | | | | I | |
| Chinese (GUR) | | | | | | | | R | | R | |
| AMA2882 Mathematics for Scientists and Engineers | | R | R | | | | | | | | |
| CAR II (GUR) | | | | | | | | | | R | |
| CLC2211P Chinese Communication for Science Professionals. (DSR Chinese) | | | | | | | | R/A | | R/A | |
| CAR III (GUR) | | | | | | | | | | R | |
| ELC3121 English for Scientific Communication (DSR Language) | | | | | | | R/A | | | R/A | |
| Service-Learning (GUR) | | | | | | | | | A | R | I/A |
| Leadership and Intra-Personal Development (GUR) | | | | | | | | | A | R | R |
| CAR IV (GUR) | | | | | | | A | A | A | R | I/A |

Remarks:

GUR - General University Requirements (please refer to p. 18)

CAR - Cluster Areas Requirement (please refer to p. 18 and Appendix V)

DSR - Discipline Specific Requirements

8. REGISTRATION

8.1 Please read the following sections under “4. Programme Enrollment” and “5. Subject Registration” of the PolyU’s Student Handbook [which can be obtained on the Academic Registry’s website].

4. Programme Enrollment

- F. Leave of Absence
- H. Deferment of Study
- I. Zero Subject Enrolment and Retention of Study Place
- K. Student Status
- L. Withdrawal of Study

5. Subject Registration

- A. Subject Registration
- B. Subject Exemption and Credit Transfer
- C. Retaking of Subjects
- D. Unqualified Subjects
- E. Add / Drop of Subjects and Change of Subject Groups
- F. Taking Additional Subjects
- G. Withdrawal of Subjects

9. NORMAL DURATION FOR COMPLETION OF THE PROGRAMME

9.1 Students should complete the programme within the normal duration of the programme as specified in the Programme Requirement Document. Those who exceed the normal duration of the programme will be de-registered from the programme unless prior approval has been obtained from relevant authorities. The study period of a student shall exclude deferment granted for justifiable reasons, and the semester(s) when the student has been approved to undertake internship. Any semester in which the students are allowed to take zero subject will be counted towards their total period of registration.

9.2 Students who have been registered for the normal duration of the programme may request extension of their studies for up to one year with the approval of the relevant Heads of Department. Applications for extension of study period beyond one year and up to two years will require the approval from Faculty Board Chairman.

9.3 Students who have exceeded the normal duration of the programme for more than two years (four years for part-time articulation degree programmes offered by SPEED) and have been de-registered can submit an appeal to the Academic Appeals Committee to request further extension. If the appeal fails, the student shall be de-registered.

10. ASSESSMENT AND PROGRESSION

10.1 Assessment methods

- 10.1.1 Students' performance in a subject shall be assessed by continuous assessment, practical test and/or examinations. The weighting of each in the overall subject grade is stated in the respective subject description form.
- 10.1.2 Continuous assessment may include tests, assignments, projects, laboratory work, field exercises, presentations and other forms of classroom participation. Continuous Assessment assignments which involve group work should nevertheless include some individual components therein. The contribution made by each student in continuous assessment involving a group effort shall be determined and assessed separately, and this can result in different grades being awarded to students in the same group.
- 10.1.3 For any subject offered by a servicing department (with subject code not beginning with 'AP'), a student must satisfy requirements that may be stipulated by the servicing department concerned in order to achieve an overall passing grade.
- 10.1.4 At the beginning of each semester, each subject teacher should inform students of the details of the assessment methods to be used.
- 10.1.5 The Board of Examiners is appointed to deal with special cases arising from assessment and classification of awards.
- 10.1.6 Assessment of Work-Integrated Education (WIE)

The objective of the assessment is to determine to what extent the student has achieved the intended learning outcomes of the WIE component. The WIE learning outcomes are as follow:

- achieve goals or tasks as specified by the employer in a working environment;
- be able to analyze, evaluate, synthesize and propose solutions to problems of a general nature;
- be able to communicate and collaborate effectively with others;
- possess a global outlook (for an overseas placement) or deepen the understanding of Mainland (for placement in Mainland); and become experienced in adapting to real working environment.

The WIE component carries 1 training credit for a minimum placement duration of 120 working hours. A student is required to accrue at least one WIE training credit before graduation. Students are strongly encouraged to finish their WIE requirement by the end of the summer of year 3. The component is not counted towards GPA calculation nor award classification. The students themselves should seek for WIE placements themselves or via job postings advertised by Student Affairs Office as long as the students obtain approval from the department. Some staff in the department may provide WIE placements from projects and work placements in collaboration with external organizations.

The following is the WIE assessment method.

- (i) **Report**
Upon completion of the placement, the student is required to submit a report summarizing his/her work experience and the learning outcomes that have been achieved.
- (ii) **Performance Evaluation**
At the end of the WIE placement, the workplace supervisor will provide a performance evaluation by answering a set of questions related to the achievement of intended WIE learning outcomes. The student's supervisor from AP will also give assessment at the end of the placement.
- (iii) **Overall Assessment**
Based on the report submitted by the student and the performance evaluation, a Pass grade will be given upon satisfactory completion of the intended WIE learning outcomes; otherwise a failure grade will be given.

10.2 Progression

10.2.1 The Board of Examiners shall, at the end of each semester, (except for Summer Term unless there are students who are eligible to graduate after completion of Summer Term subjects or the Summer Term study is mandatory for the programme), determine whether each student is

- (i) eligible for progression towards an award; or
- (ii) eligible for an award; or
- (iii) required to be de-registered from the programme.

10.2.2 A student will have 'progressing' status unless he/she falls within any one of the following categories, which may be regarded as grounds for deregistration from the programme:

- (i) the student has reached the final year of the normal period of registration, as specified in the Programme Requirement Document, unless approval has been given for extension; or
- (ii) the student has reached the maximum number of retakes allowed for a failed compulsory subject; or
- (iii) the student's GPA (see Section 10.5.2 below) is lower than 1.70 for two consecutive semesters and his/her Semester GPA in the second semester is also lower than 1.70; or
- (iv) the student's GPA is lower than 1.70 for three consecutive semesters.

- 10.2.3 When a student falls within any of the categories as stipulated above, except for category (ii) with approval for extension, the Board of Examiners shall de-register the student from the programme without exception.
- 10.2.4 When a student has a GPA lower than 1.70, he/she will be put on academic probation in the following semester. If a student is able to pull his/her GPA up to 1.70 or above at the end of the semester, the status of “academic probation” will be lifted. The status of “academic probation” will be reflected in the examination result notification but not in the transcript of studies.
- 10.2.5 A student may be de-registered from the programme enrolled before the time frame specified in 10.2.2 (iii) or 10.2.2 (iv) above if his/her academic performance is poor to the extent that the Board of Examiners deems that his/her change of attaining a GPA of 1.70 at the end of the programme is slim or impossible.
- 10.2.6 If the student is not satisfied with the de-registration decision of the Board of Examiners, he/she can lodge an appeal. All such appeal cases will be referred directly to the Academic Appeals Committee (AAC) for final decision. Views of Faculties/School/Departments will be sought and made available to AAC for reference.
- 10.3 Retaking of subjects
- 10.3.1 Students may only retake a subject which they have failed (i.e. Grade F or S or U).
- 10.3.2 Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded.
- 10.3.3 The number of retakes of a subject should be restricted to two, i.e. a maximum of three attempts for each subject is allowed.¹
- 10.3.4 In case where a student takes another subject to replace a failed elective subject, the fail grade will be taken into account in the calculation of the GPA, despite the passing of the replacement subject. Likewise, undergraduate or sub-degree students who fail a Cluster Area Requirement (CAR) subject may need to take another subject from the same Cluster Area in order to fulfill this part of the GUR, since the original CAR subject may not be offered; in such cases, the fail grade for the first CAR subject will be taken into account in the calculation of the GPA, despite the passing of the second CAR subject.²
- 10.3.5 Students need to submit a request to the Faculty/School Board for the second retake of a failed subject.
- 10.3.6 Students who have failed a compulsory subject after two retakes and have been deregistered can submit an appeal to the Academic Appeals Committee (AAC) for a third chance of retaking the subject.

10.3.7 In relation to 10.3.6 above, in case AAC does not approve further retakes of a failed compulsory subject or the taking of an equivalent subject with special approval from the Faculty, the student concerned would be de-registered and the decision of the AAC shall be final within the University.

¹ The retake count for students admitted in or before 2019/20 will be reset to “0” in 2020/21 when the revised regulations come into effect.

² In these circumstances when students do not have a choice to retake a failed subject, such as when the failed subject has been phased out, a ‘tie-subject’ arrangement can be made with the approval of the Faculty/School Board. Under the arrangement, another appropriate subject can be taken as equivalent to the subject which is not offered. Upon passing the equivalent subject, the fail grade of the original subject will be replaced by the latest grade of the retake subject and the failure grade of the original subject will not be taken into account in the calculation of the GPA.

10.4 Exceptional circumstances

10.4.1 *Absence from an assessment component:* If a student is unable to complete all the assessment components of a subject due to illness or other circumstances which are beyond his/her control, and considered by the subject offering department as legitimate, the Department will determine whether the student will have to complete a late assessment and, if so, by what means. This late assessment shall take place at the earliest opportunity, and before the commencement of the following academic year (except that for Summer Term, which may take place within 3 weeks after the finalisation of Summer Term results). The student will not receive a grade for the subject prior to his/her completion of the assessment component(s). The student concerned is required to submit his/her application for late assessment in writing to the Head of Department offering the subject, within five working days from the date of the examination, together with any supporting documents. Approval of applications for late assessment and the means for such late assessments shall be given by the Head of Department offering the subject or the Subject teacher concerned, in consultation with the Programme Leader.

10.4.2 *Other particular circumstances:* A student’s particular circumstances may influence the procedures for assessment but not the standard of performance expected in assessment.

10.5 Grading

10.5.1 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject is graded as follows:

| <i>Subject Grade</i> | <i>Short Description</i> | <i>Elaboration on Subject Grading Description</i> |
|----------------------|--------------------------|--|
| A+ A A- | Excellent | Demonstrates excellent achievement of intended subject learning outcomes by being able to skillfully use concepts and solve complex problems. Shows evidence of innovative and critical thinking in unfamiliar situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner. |
| B+ B B- | Good | Demonstrates good achievement of intended subject learning outcomes by being able to use appropriate concepts and solve problems. Shows the ability to analyse issues critically and make well-grounded judgements in familiar or standard situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner. |
| C+ C C- | Satisfactory | Demonstrates satisfactory achievement of intended subject learning outcomes by being able to solve relatively simple problems. Shows some capacity for analysis and making judgements in a variety of familiar and standard situations, and is able to express the synthesis or application of ideas in a manner that is generally logical but fragmented. |
| D+ D | Pass | Demonstrates marginal achievement of intended subject learning outcomes by being able to solve relatively simple problems. Can make basic comparisons, connections and judgments and express the ideas learnt in the subject, though there are frequent breakdowns in logic and clarity. |
| F | Fail | Demonstrates inadequate achievement of intended subject learning outcomes through a lack of knowledge and/or understanding of the subject matter. Evidence of analysis is often irrelevant or incomplete. |

'F' is a subject failure grade, whilst all others ('D' to 'A+') are subject passing grades. No credit will be earned if a subject is failed.

Notes:

- Marking rubrics aligned with these Grade Descriptors need not include all aspects of the grade descriptor.

- Marking rubrics aligned with these Grade Descriptors may include other aspects aligned with particular subject matter or field of study requirements but are not included in the grade descriptor.

Indicative descriptors for modifier grades

| | |
|-----------------------|--|
| Main Grade (solid) | The student generally performed at this level, indicating mastery of the subject intended learning outcomes at this level. |
| + (exemplary) | The student consistently performed at this level and exceeded the expectations of this level in some regards, but not enough to claim mastery at the next level. |
| - (marginal) | The student basically performed at this level, but the performance was inconsistent or fell slightly short in some regards. |

Note: The above indicative descriptors for modifier grades are not applicable to the pass grades D and D+

10.5.2 At the end of each semester, a Grade Point Average (GPA) will be computed as follows, and based on the grade point of all the subjects:

$$\text{GPA} = \frac{\sum_{n=1}^N \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n}{\sum_{n=1}^N \text{Subject Credit Value}_n}$$

where N = number of all subjects (inclusive of failed subjects) taken by the student up to and including the latest semester/term. For subjects which have been retaken, only the grade point obtained in the final attempt will be included in the GPA calculation

In addition, the following subjects will be excluded from the GPA calculation:

- (i) Exempted subjects
- (ii) Ungraded subjects
- (iii) Incomplete subjects
- (iv) Subjects for which credit transfer has been approved without any grade assigned
- (v) Subjects from which a student has been allowed to withdraw (i.e. those with the code 'W')

Subject which has been given an "S" code, i.e. absent from all assessment components, will be included in the GPA calculation and will be counted as "zero" grade point. GPA is thus the unweighted cumulative average calculated for a student, for all relevant subjects taken from the start of the programme to a particular point of time. GPA is an indicator of overall performance, and ranges from 0.00 to 4.30 from 2020/21.

10.5.3 The codes to denote overall subject assessment and for final assessments are included in Appendices II and III.

10.6 Misconducts

10.6.1 The Department regards academic integrity as most essential. Acts of dishonesty in assessments and examinations will be seriously treated. Offenders may be brought up to Student Discipline Committee for action as appropriate.

(i) With effect from Semester One of 2015/16, disciplinary actions against students' misconducts will be recorded in students' records.

(ii) Students who are found guilty of academic dishonesty will be subject to the penalty of having the subject result concerned disqualified and be given a failure grade with a remark denoting 'Disqualification of result due to academic dishonesty'. The remark will be shown in the students' record as well as the assessment result notification and transcript of studies, until their leaving the University.

(iii) Students who have committed disciplinary offences (covering both academic and non-academic related matters) will be put on 'disciplinary probation'. The status of 'disciplinary probation' will be shown in the students' record as well as the assessment result notification, transcript of studies and testimonial during the probation period, until their leaving the University. The disciplinary probation is normally one year unless otherwise decided by the Student Discipline Committee.

10.6.2 The University reserves the right to withhold the issuance of any certificate of study to a student who has unsettled matters with the University, or subject to disciplinary action.

10.6.3 Students who have committed academic dishonesty will be subject to the penalty of the lowering of award classification by one level. For undergraduate students who should be awarded a Third class Honours degree, they will be downgraded to a Pass-without-Honours. The minimum of downgraded overall result will be kept at a Pass. The proposed penalty will be discussed in both Subject Assessment Review Panel (SARP) and/or Board of Examiners (BoE) meeting. Student will be allowed to appeal to the Head of Department using the regular appeal procedure as stipulated in the Student Handbook. In rare circumstances where both the Student Discipline Committee and Board of Examiners of a Department consider that there are strong justifications showing the offence be less serious, the requirement for lowering the award classification can be waived.

11. FINAL AWARD

11.1 Graduation requirements

11.1.1 A student would be eligible for award of a BSc (Hons) in EP if he/she satisfies all the conditions listed below.

(i) Programme Requirement: at least 125 credits
(Depending on the students attainment of HKDSE)

(ii) University Graduation Requirements:

1. Earn a cumulative GPA (or both a Major GPA and Minor GPA if applicable) of 1.70 or above at graduation.
2. Complete successfully the mandatory Work-Integrated Education (WIE) component as specified by the major programme.
3. Satisfy the residential requirement for at least 1/3 of the credits to be completed for the award of BSc(Hons) in EP.
4. Satisfy the following General University Requirements (GUR):

| | |
|--|---------------------------|
| (a) Language and Communication Requirements ² | 9 credits |
| (b) Freshman Seminar | 3 credits |
| (c) Leadership and Intra-Personal Development | 3 credits |
| (d) Service-Learning | 3 credits |
| (e) Cluster Areas Requirement (CAR) | 12 credits |
| (f) China Studies Requirement | (3 of the 12 CAR credits) |
| (g) Healthy Lifestyle | Non-credit bearing |
| | Total = 30 credits |

5. Language and Communication Requirements (Refer to Appendix IV).
6. Cluster Areas Requirement (Refer to Appendix V).

11.1.2 A student is required to graduate as soon as he/she satisfies the graduation requirements as stipulated above. The student concerned is required to apply for graduation, in the semester in which he is able to fulfil all his graduation requirements, and after the add/drop period for that semester has ended.

11.2 Guidelines for award classification

11.2.1 Classification of awards is based on the final Weighted GPA (see the following paragraph). There is no automatic conversion between the Weighted GPA and the award classification. The Board of Examiners shall exercise its judgement in coming to its conclusions as to the award for each student, and where appropriate, may use other relevant information.

11.2.2 The Weighted Grade Point Average is defined as follows:

² Non-Chinese speakers and those students whose Chinese standards are at junior secondary level or below will by default be exempted from the DSR - Chinese and CAR - Chinese Reading and Writing requirements. However, this group of students would still be required to take one Chinese LCR subject to fulfil their Chinese LCR.

$$\text{Weighted GPA} = \frac{\sum_{n=1}^N \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n \times W_n}{\sum_{n=1}^N \text{Subject Credit Value}_n \times W_n}$$

where W_i is the subject level weighting with

$$W_i = \begin{cases} 2 & \text{for level I and II subjects} \\ 3 & \text{for level III and IV subjects} \end{cases}$$

The Weighted GPA will also be ranged from 0.00 to 4.30..

n = number of all subjects counted in GPA calculation as set out in Section 10.5.2, except those exclusion specified in Sections 11.2.2 to 11.2.3.

11.2.3 Any subjects passed after the graduation requirement has been met or subjects taken on top of the prescribed credit requirements for award shall not be taken into account in the grade point calculations for award classification. However, if a student attempts more elective subjects than those required for graduation in or before the semester in which he/she becomes eligible for award, the elective subjects, except for subject which are selected by students to fulfill the free electives requirement for graduation, with a higher grade/contribution shall be included in the grade point calculation (i.e. the excessive subjects attempted with a lower grade/contribution, including failed subjects, will be excluded).

11.2.4 The following are guidelines for Boards of Examiners' reference in determining award classifications:

| <i>Honours degrees</i> | <i>Guidelines</i> |
|------------------------|--|
| 1st | The student's performance/attainment is outstanding, and identifies him as exceptionally able in the field covered by the programme in question. |
| 2:i | The student has reached a standard of performance/attainment which is more than satisfactory but less than outstanding. |
| 2:ii | The student has reached a standard of performance/attainment judged to be satisfactory, and clearly higher than the 'essential minimum' required for graduation. |
| 3rd | The student has attained the 'essential minimum' required for graduation at a standard ranging from just adequate to just satisfactory. |

11.2.5 Under exceptional circumstances, a student who has completed an Honours degree programme, but has not attained Honours standard, may be awarded a Pass-without-Honours degree. A Pass-without-Honours degree award will be recommended only under exceptional circumstances, when the student has demonstrated a level of final attainment which is below the 'essential minimum' required for graduation with Honours from the Programme, but when he/she has nonetheless covered the prescribed work of the Programme in an adequate fashion, while failing to show sufficient evidence of the intellectual calibre expected of Honours degree graduates. For example, if a student in an Honours degree programme has

a Grade Point Average (GPA) of 1.70 or more, but his Weighted GPA is less than 1.70, he/she may be considered for a Pass-without-Honours classification.

11.3 Aegrotat award

11.3.1 If a student is unable to complete the requirements of the Programme for the award due to very serious illness or other very special circumstances which are beyond his control, and considered by the Board of Examiners as legitimate, the Faculty Board will determine whether the student will be granted an aegrotat award. Aegrotat award will be granted under very exceptional circumstances.

11.3.2 A student who has been offered an aegrotat award shall have the right to opt either to accept such an award, or request to be assessed on another occasion to be stipulated by the Board of Examiners; the student's exercise of this option shall be irrevocable.

11.3.3 The acceptance of an aegrotat award by a student shall disqualify him/her from any subsequent assessment for the same award.

11.3.4 An aegrotat award shall normally not be classified, and the award parchment shall not state that it is an aegrotat award. However, the Board of Examiners may determine whether the award should be classified provided that they have adequate information on the students' academic performance.

12. STUDENT APPEALS

Please refer to the section of 'I. Academic Appeal' under '6. Assessment' in the 'Student Handbook'. It is available in Academic Registry's website.

13. UNIVERSITY REGULATIONS

The regulations in this document are only for those which apply specifically to the BSc (Hons) in EP. Students should consult the current issue of the "Student Handbook, Full-time and Part-time Studies" for the General Regulations of the University.

(Should discrepancy between the contents of this document and University regulations arise, University regulations will always prevail.)

14. AMENDMENTS

This Programme Requirement Document is subject to review and changes which the programme offering Department can decide to make from time to time. Students will be informed of the changes as and when appropriate.

15. MAJOR/MINOR OPTION

For the graduation requirements of specific programmes of study (majors and minors), candidates should refer to the relevant section of AR website or consult the programme-offering departments concerned.

15.1 Graduation requirements

Students taking the Major/Minor route would be eligible for applying for graduation based on the following conditions.

- (i) Satisfy the requirements of the Major studies which are the same as the graduation requirements of the “Single Degree”.
- (ii) Satisfy the requirements of the Minor studies.

15.2 Award for Major/Minor studies

15.2.1 For students who have completed a Major and a Minor programme, their award classification will be based on both their “Major GPA” and “Minor GPA”.

15.2.2 “Major GPA” is derived in the same way as that for the “Single Degree”.

15.2.3 “Minor GPA” is derived based on the 18 credits of Minor study. “Minor GPA” is unweighted.

15.2.4 The “Major GPA” and the “Minor GPA” will be presented separately to the Board of Examiners for consideration.

15.2.5 In order to be eligible for a particular award classification, a student should have comparable standard of performance in both his/her Major and Minor studies.

15.2.6 In cases where the attainment of students in the Minor study warrants the granting of one classification lower than that the students deserve for his/her Major study, the Board of Examiners has the discretion to recommend the upper classification which reflects the performance on the Major study better.

16. ACADEMIC ADVISING SYSTEM

To help students understand the nature of academic advising at PolyU, a guide to academic advising is available. The guide includes the following topics:

- The meaning and nature of academic advising
- Making the most of university learning experience
- Policies on academic advising at PolyU
- Infrastructure and procedures for academic advising at PolyU
- Roles and responsibilities of academic advisors and students in academic advising

- Strategies leading to academic success
- Student preparation for academic advising
- Evaluation of academic advising

The website of the university about the academic advising is <https://www.polyu.edu.hk/sao/cws/academic-advising/academic-advising/what-is-academic-advising/>, and the website of Departmental Academic Advising system is <https://www.polyu.edu.hk/ap/study/academic-advising>.

Appendix I: Subject Description Forms

The Subject Description Forms of AP's subjects can be found in AP's website:
<https://www.polyu.edu.hk/ap/study/subject-list/undergraduate/>

The Subject Description Forms of AMA's subjects can be found in AMA's website:
http://www.polyu.edu.hk/ama/listing_of_subjects/

Summary of the Subject Information

| Subject Code | Subject Name | Credit | Pre-requisite | Teaching Methods | Assessment Methods |
|---------------------|--|---------------|----------------------|---|---|
| AP10001 | Introduction to Physics | 3 | Nil | Lecture, student-centered tutorial and e-learning | Continuous assessment and examination |
| AP10005 | Physics I | 3 | Nil | Lecture, student-centered tutorial and e-learning | Continuous assessment and examination |
| AP10006 | Physics II | 3 | Nil | Lecture, student-centered tutorial and e-learning | Continuous assessment and examination |
| AP10007 | Applied Physics Laboratory | 3 | Nil | Laboratory | Continuous assessment, practical examination and written test |
| AP20001 | Electromagnetism | 3 | AP10006 | Lecture and student-centered tutorial | Continuous assessment and examination |
| AP20002 | Materials Science | 3 | Nil | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP20003 | Mechanics | 3 | AP10005 | Lecture, tutorial and e-learning | Continuous assessment and examination |
| AP20005 | Programming in Physics | 3 | Nil | Lecture and computer laboratory | Continuous assessment and examination |
| AP20006 | Quantum Mechanics for Scientists and Engineers | 3 | AP10006 | Lecture, student-centered tutorial and e-learning | Continuous assessment and examination |
| AP20007 | Fundamentals of Scientific Instrumentation | 3 | Nil | Lecture and lab session | Continuous assessment, practical test and examination |
| AP20008 | Waves | 3 | AP10006 | Lecture and tutorial | Continuous assessment and examination |
| AP30001 | Applied Acoustics | 3 | AP20003 | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP30002 | Computational Physics | 3 | AP20005 | Lecture and computer laboratory | Continuous assessment and examination |
| AP30003 | Detectors and Imaging Devices | 3 | AP20006 | Lecture, laboratory and presentation | Continuous assessment and examination |
| AP30004 | Electromagnetic Fields | 3 | AP20001 AP20008 | Lecture and laboratory | Continuous assessment and examination |
| AP30005 | Advanced Scientific Instrumentation | 3 | Nil | Lecture and laboratory | Continuous assessment, practical examination and written test |
| AP30006 | Metallurgy and Ceramics Science | 3 | AP20002 | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP30007 | Optical Design | 3 | Nil | Lecture and practical assignment | Continuous assessment and examination |

| Subject Code | Subject Name | Credit | Pre-requisite | Teaching Methods | Assessment Methods |
|---------------------|---|---------------|----------------------|---------------------------------------|---|
| AP30008 | Polymers and Composites | 3 | Nil | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP30009 | Laser Principles and Applications | 3 | Nil | Lecture and student-centered tutorial | Continuous assessment and examination |
| AP30010 | Radiation Physics | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| AP30011 | Solid State Physics | 3 | AP20006 | Lecture, tutorial and e-learning | Continuous assessment and examination |
| AP30012 | Thermal and Statistical Physics | 3 | AP20006 | Lecture and tutorial | Continuous assessment and examination |
| AP30013 | Photonics Laboratory | 3 | Nil | Laboratory | Continuous assessment, practical examination and written test |
| AP30014 | Science & Technology of Photovoltaics | 3 | AP20006 | Lecture, tutorial and laboratory | Continuous assessment, and examination |
| AP30015 | Functional Materials | 3 | AP20002 | Lecture and tutorial | Continuous assessment, and examination |
| AP30017 | Medical Imaging: Science and Technology | 3 | Nil | Lecture and tutorial | Continuous assessment, and examination |
| AP40001 | Advanced Physics Laboratory | 3 | AP10007 | Laboratory | Continuous assessment, practical examination and written test |
| AP40002 | Display Technology | 3 | Nil | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP40003 | Solid State Lighting | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| AP40004 | Project | 4 | Nil | Presentation | Continuous assessment, project report and oral |
| AP40005 | Optoelectronic Packaging and Reliability | 3 | Nil | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP40006 | Semiconductor Materials and Devices | 3 | AP20002 | Lecture, tutorial and laboratory | Continuous assessment and examination |
| AP40007 | Simulation and Analysis of Optoelectronic Devices | 3 | AP20001 | Lecture and laboratory | Continuous assessment and examination |
| AP40008 | Simulation Methods in Nonlinear Science | 3 | AP20005 | Lecture and computer laboratory | Continuous assessment and examination |
| AP40009 | Advanced Photonics Laboratory | 3 | AP30013 | Laboratory | Continuous assessment, practical examination and written test |
| AP40010 | Lighting Control Technology | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| AP40011 | Materials in Energy Conversion and Storage | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| ABCT1101 | Introductory Life Science | 3 | Nil | Lecture, tutorial and self-study | Written assessment and examination |

| Subject Code | Subject Name | Credit | Pre-requisite | Teaching Methods | Assessment Methods |
|---------------------|---|---------------|----------------------|---|---|
| ABCT1102 | General Biology | 3 | ABCT1101 | Lecture, tutorial, field trip and self-study | Written assessment, written assignment and examination |
| ABCT1700 | Introduction to Chemistry | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| ABCT1741 | General Chemistry I | 3 | Nil | Lecture and tutorial | Continuous assessment and examination |
| AMA1006 | Basic Statistics | 2 | AMA1100 | Lecture and tutorial | Assignments/test and examination |
| AMA1007 | Calculus and Linear Algebra | 3 | AMA1100 | Lecture, tutorial and exercise | Test/assignments and examination |
| AMA1100 | Foundation Mathematics - an introduction to Algebra and Differential Calculus | 2 | Nil | Lecture and tutorial | Homework, quizzes, mid-term test and examination |
| AMA2882 | Mathematics for Scientists and Engineers | 4 | Nil | Lecture and tutorial | Continuous assessment and examination |
| CLC2211P | Chinese Communication for Science Professionals | 2 | Nil | Seminars and self-study | Assessment, class participation and examination |
| ELC3121 | English for Scientific Communication | 2 | LCR English subjects | Seminar | Tests |
| AP10000 | Freshman Seminar atom to the Universe | 3 | Nil | Lecture, tutorial, group discussion and tour | Project, presentation, tour/seminar |
| APSS1L01 | Tomorrow's Leaders | 3 | Nil | Lectures and experiential learning activities | Class Participation, Peer Assessment, Group Project and Individual Assignment |

Subject Description Form

| Subject Code | ABCT1101 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---------------|--|--|--|------|--|------|---|------|-----------|--|---|------|-----------------------------|-------|------------------------------|------|-------------------------------------|-------|---------------|--|--------------------------|------|--|-------|---|-------|---|-------|---|--|---|------|---------------------------------------|------|--|------|---|-------|-----------------------|--|-------------------------|--|-----------------------------------|------|------------------|-------|
| Subject Title | Introductory Life Science | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Credit Value | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Level | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pre-requisite/ Co-requisite/ Exclusion | No pre-requisite | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Objectives | In this subject, students will be introduced to the very basic background knowledge and concepts in biology, together with some recent advances in biotechnology. The main aim of this subject is to arouse students' interest in biological developments so that they can appreciate the impact of biotechnology. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intended Learning Outcomes | Upon completion of the subject, students will be able to: (a) have a basic understanding of the biological world (b) appreciate the importance of the biological world to human (c) appreciate the recent biotechnological advancement and their impacts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subject Synopsis/ Indicative Syllabus | <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: right; vertical-align: bottom;">Contact Hours</th> </tr> </thead> <tbody> <tr> <td>The different forms of biological organisms:</td> <td></td> </tr> <tr> <td>(1) Viruses, Bacteria, Protozoa, Algae, Fungi, Plants, Animals</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(2) The involvement of these different organisms in our daily life</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(3) The importance of ecology and biodiversity to human</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>The cell:</td> <td></td> </tr> <tr> <td>(1) The building blocks of biological organisms</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(2) Structure and functions</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>(3) Different types of cells</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(4) Cell division and proliferation</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>The heredity:</td> <td></td> </tr> <tr> <td>(1) The genetic material</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(2) The genetic information in the form of genes</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>(3) The expression of the genetic information</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>(4) The passing of genetic information to offspring</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>The organization and functions of complex biological organisms:</td> <td></td> </tr> <tr> <td>(1) The structure and functions of plants</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(2) The importance of plants to human</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(3) The structure and functions of animals – human as an example</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(4) Organization of tissues, organs and functional systems in human</td> <td style="text-align: right;">5 Hrs</td> </tr> <tr> <td>Modern biotechnology:</td> <td></td> </tr> <tr> <td>(1) Major developments:</td> <td></td> </tr> <tr> <td>(a) <i>In vitro</i> fertilization</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>(b) Gene cloning</td> <td style="text-align: right;">2 Hrs</td> </tr> </tbody> </table> | | Contact Hours | The different forms of biological organisms: | | (1) Viruses, Bacteria, Protozoa, Algae, Fungi, Plants, Animals | 1 Hr | (2) The involvement of these different organisms in our daily life | 1 Hr | (3) The importance of ecology and biodiversity to human | 1 Hr | The cell: | | (1) The building blocks of biological organisms | 1 Hr | (2) Structure and functions | 2 Hrs | (3) Different types of cells | 1 Hr | (4) Cell division and proliferation | 2 Hrs | The heredity: | | (1) The genetic material | 1 Hr | (2) The genetic information in the form of genes | 2 Hrs | (3) The expression of the genetic information | 2 Hrs | (4) The passing of genetic information to offspring | 2 Hrs | The organization and functions of complex biological organisms: | | (1) The structure and functions of plants | 1 Hr | (2) The importance of plants to human | 1 Hr | (3) The structure and functions of animals – human as an example | 1 Hr | (4) Organization of tissues, organs and functional systems in human | 5 Hrs | Modern biotechnology: | | (1) Major developments: | | (a) <i>In vitro</i> fertilization | 1 Hr | (b) Gene cloning | 2 Hrs |
| | Contact Hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The different forms of biological organisms: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) Viruses, Bacteria, Protozoa, Algae, Fungi, Plants, Animals | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) The involvement of these different organisms in our daily life | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) The importance of ecology and biodiversity to human | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The cell: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) The building blocks of biological organisms | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Structure and functions | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) Different types of cells | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) Cell division and proliferation | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The heredity: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) The genetic material | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) The genetic information in the form of genes | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) The expression of the genetic information | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) The passing of genetic information to offspring | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The organization and functions of complex biological organisms: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) The structure and functions of plants | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) The importance of plants to human | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) The structure and functions of animals – human as an example | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) Organization of tissues, organs and functional systems in human | 5 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modern biotechnology: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) Major developments: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (a) <i>In vitro</i> fertilization | 1 Hr | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (b) Gene cloning | 2 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | (c) GM foods (d) GM organisms (e) Gene therapy (f) Stem cell therapy (g) Human genome project (h) Human cloning (2) Their impacts on our life, present and future, and the environment (3) Ethical, social and legal issues | 2 Hrs 2 Hrs 1 Hr 1 Hr 2 Hrs 1 Hr 2 Hrs 4 Hrs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|---|-----------------------------------|-------------|---|--|--|---|---|---|--------------------------|----|---|---|--|---------------------------|----|---|---|--|------------------------|----|---|---|---|-------------------------|----|---|---|---|-------|-----|--|--|--|
| Teaching/Learning Methodology | In the Lectures, the basic concepts and knowledge will be delivered to the students. These knowledge and concepts will be further enhanced through tutorial exercises, discussions and debates during tutorials, and through assessments. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Methods in Alignment with Intended Learning Outcomes | <table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>(1) Written assessment I</td> <td>15</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>(2) Written assessment II</td> <td>20</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>(3) Written assignment</td> <td>15</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>(4) End of subject exam</td> <td>50</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Each student will be required to read broadly and to complete a written assignment in which an understanding of some of the major concepts and knowledge has to be demonstrated. In this written assignment, a student will also need to express his/her critical evaluation of the impacts of a new development in biotechnology. This assignment will be in the form of a critical review essay.</p> <p>A student will also need to take two tests (Written assessments I & II) which will gauge their learning outcomes at two separate stages of the subject. These assessments will also allow students to get feedbacks on their performance and how well they are achieving the learning outcomes.</p> <p>There will also be an end of subject assessment which will assess all of the four learning outcomes. This will most likely be in the form of an examination.</p> | | | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | a | b | c | (1) Written assessment I | 15 | ✓ | ✓ | | (2) Written assessment II | 20 | ✓ | ✓ | | (3) Written assignment | 15 | ✓ | ✓ | ✓ | (4) End of subject exam | 50 | ✓ | ✓ | ✓ | Total | 100 | | | |
| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | a | b | c | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) Written assessment I | 15 | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Written assessment II | 20 | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) Written assignment | 15 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) End of subject exam | 50 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Student Study Effort Expected | Class contact: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | • Lectures | 28 h | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | • Tutorials | 14 h | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Other student study effort: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | • Self Study | 66 h | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|------------------------------------|----------------------------|-------|
| | Total student study effort | 108 h |
| Reading List and References | | |

Subject Description Form

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|--|---|----------------------|
| Subject Code | ABCT1102 | |
| Subject Title | General Biology | |
| Credit Value | 3 | |
| Level | 1 | |
| Pre-requisite / Co-requisite/ Exclusion | Pre-requisite: ABCT 1101, or Level 3 or above in HKDSE Biology as a full subject or as a component in a Combined Science subject | |
| Objectives | In this subject, students will learn the basic knowledge and concepts in various areas of biology at the university entry level. It underpins all the other subjects in biological or health fields. | |
| Intended Learning Outcomes | <p>Upon completion of the subject, students will be able to:</p> <p>(a) have a basic understanding of the structure and functions of the cell</p> <p>(b) have a basic understanding of genetics and inheritance</p> <p>(c) have a basic understanding of the structure and function of animals</p> <p>(d) have a basic understanding of the structure and function of plants</p> <p>(e) appreciate the importance of evolution and biological diversity</p> | |
| Subject Synopsis/ Indicative Syllabus | | Contact Hours |
| | THE CELL: | |
| | Molecules and structure of the cell | 2 Hrs |
| | Activities inside the cell | 2 Hrs |
| | Harvesting chemical energy in the cell | 2 Hrs |
| | Photosynthesis: Harvesting light energy and producing food | 2 Hrs |
| | CELLULAR REPRODUCTION AND GENETICS | |
| | Reproduction and inheritance at the cellular level | 2 Hrs |
| | Patterns of inheritance | 2 Hrs |
| | Molecular biology of the gene | 2 Hrs |
| | Gene control | 2 Hrs |
| | DNA technology and genomics | 2 Hrs |
| | EVOLUTION AND BIOLOGICAL DIVERSITY | |
| | The origin and evolution of microbial life: Prokaryotes and protists | 1 Hr |
| | Plants, fungi, and the colonization of Land | 1 Hr |
| | Invertebrate diversity | 1 Hr |
| | Vertebrate diversity | 1 Hr |

| | <p>ANIMALS: FORM AND FUNCTION</p> <p>Unifying concepts of animal structure and function 1 Hr</p> <p>Nutrition and digestion 2 Hr</p> <p>Gas exchange and circulation 2 Hr</p> <p>Control of body temperature and water balance 2 Hrs</p> <p>Hormones and the endocrine system 2 Hr</p> <p>Reproduction 2 Hr</p> <p>Control systems in plants 1 Hr</p> <p>ECOLOGY</p> <p>The biosphere 1 Hr</p> <p>Behavioral adaptations to the environment 1 Hr</p> <p>Population ecology 1 Hr</p> <p>Communities and ecosystems 1 Hr</p> <p>Conservation biology 1 Hr</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-----------------------------------|-------------|--|--------|-------------|--------|-----------------------------|---|--------------|--------|----------------------------|---------|-------------------------|-----|---|---|--|--|---|--------------------------|-----|---|---|---|---|---|-----------------------|-----|---|---|---|---|---|------------------------|-----|---|---|---|---|---|-------|-------|--|--|--|--|--|
| Teaching/Learning Methodology | <p>Lectures</p> <p>Tutorials with exercises and discussions</p> <p>mini-project</p> <p>Self Study</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Methods in Alignment with Intended Learning Outcomes | <table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>1. Written assessment I</td> <td>20%</td> <td>✓</td> <td>✓</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>2. Written assessment II</td> <td>20%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Written assignment</td> <td>10%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>4. End of subject exam</td> <td>50%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="5"></td> </tr> </tbody> </table> | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | a | b | c | d | e | 1. Written assessment I | 20% | ✓ | ✓ | | | ✓ | 2. Written assessment II | 20% | ✓ | ✓ | ✓ | ✓ | ✓ | 3. Written assignment | 10% | ✓ | ✓ | ✓ | ✓ | ✓ | 4. End of subject exam | 50% | ✓ | ✓ | ✓ | ✓ | ✓ | Total | 100 % | | | | | |
| Specific assessment methods/tasks | % weighting | | | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | a | b | c | d | e | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Written assessment I | 20% | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Written assessment II | 20% | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Written assignment | 10% | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. End of subject exam | 50% | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Student Study Effort Expected | <table border="1"> <tbody> <tr> <td>Class contact:</td> <td></td> </tr> <tr> <td>▪ Lectures</td> <td>28Hrs.</td> </tr> <tr> <td>▪ Tutorials</td> <td>13Hrs.</td> </tr> <tr> <td>Other student study effort:</td> <td></td> </tr> <tr> <td>▪ Self Study</td> <td>72Hrs.</td> </tr> <tr> <td>Total student study effort</td> <td>111Hrs.</td> </tr> </tbody> </table> | Class contact: | | ▪ Lectures | 28Hrs. | ▪ Tutorials | 13Hrs. | Other student study effort: | | ▪ Self Study | 72Hrs. | Total student study effort | 111Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Class contact: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Lectures | 28Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Tutorials | 13Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other student study effort: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Self Study | 72Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total student study effort | 111Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reading List and References | <p><u>Text book:</u></p> <p>Campbell Biology: Concepts and Connections, 7/E</p> <p>Jane B. Reece, Martha R. Taylor, Eric J. Simon, Jean L. Dickey Pearson 2012</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Reference:

Essentials of Biology, 3/E

Sylvia S. Mader

McGraw-Hill 2012

Subject Description Form

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|--|--|
| Subject Code | ABCT1700 |
| Subject Title | Introduction to Chemistry |
| Credit Value | 3 |
| Level | 1 |
| Pre-requisite / Co-requisite/ Exclusion | No pre-requisite. This subject is intended for students who has DO NOT have background in NSS Chemistry |
| Objectives | This is a one-semester introductory course of Chemistry for non-majors. This course surveys the fundamental concepts in chemistry for understanding structure and properties of the material universe. Principles will be illustrated with application to daily life. |
| Intended Learning Outcomes | Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> (a) understand the core concepts of chemistry; (b) describe chemical structures and events using standard representations; (c) apply and incorporate the chemical principles and knowledge learned to solve chemical problems and to appreciate modern applications in real life. |
| Subject Synopsis/ Indicative Syllabus | <p>Foundation: atoms, molecules and ionic compounds, masses of atoms, stoichiometry, naming of chemical compounds, physical properties of compounds, Periodic table</p> <p>Chemical Reactions: Chemical equations, major reaction types, enthalpy of chemical processes</p> <p>Atoms: Light, electrons, quantum numbers and atomic orbitals, electronic configurations; general periodic trends in properties among elements.</p> <p>Chemical Bonding: Nature of chemical bonding, ionic bond, covalent bond, valence bond theory and hybridization; resonance; molecular shape by VSEPR method, bond polarity, intermolecular forces.</p> <p>Chemistry of Carbon: Naming of compounds containing carbon chains and rings. Isomerism, regioisomers and optical isomers. Major functional groups: alkanes, alkenes, alcohols, aldehydes, ketones, arboxylic acids and esters. Major reactions and properties of functional groups.</p> |
| Teaching/Learning Methodology | <p>Lecture: the fundamental principles of chemistry will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. Take-home problem sets will be given, and the students are encouraged to solve the problems before seeking assistance.</p> <p>Tutorials: students present their solutions on a set of problems in the tutorials. Students should try the problems before seeking assistance. These problem sets provide them opportunities to apply the knowledge gained from the lecture. They also help the students consolidate and familiarize with what they have learned. Furthermore, students</p> |

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| | can develop a deeper understanding of the subject through group discussion and self-study. | | | | |
| Assessment Methods in Alignment with Intended Learning Outcomes | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
| | | | a | b | c |
| | (1) Written examination | 50 | ✓ | ✓ | ✓ |
| | (2) Continuous assessment | 50 | ✓ | ✓ | ✓ |
| | Total | 100 | | | |
| | <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Assignments, quizzes and examinations are used to assess student's learning in key physical concepts in atomic structure, chemical bonding, and chemical reactions. Homework assignments (e.g. end-of-chapter exercises and online assignments) would reinforce student's knowledge in these key topics and practice for their numerical skills and problem-solving skill through analysis of experimental data.</p> | | | | |
| Student Study Effort Expected | Class contact: | | | | |
| | • Lecture | | 26 h | | |
| | • Tutorial | | 13 h | | |
| | Other student study effort: | | | | |
| | • Self study | | 50 h | | |
| | • Problem assignments / homework | | 16 h | | |
| | Total student study effort | | 105 h | | |
| Reading List and References | <u>Essential</u> (tentative) | | | | |
| | Tro, Nivaldo Introductory Chemistry Pearson 2012 | | | | |

Subject Description Form

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|--|--|
| Subject Code | ABCT1741 |
| Subject Title | General Chemistry I |
| Credit Value | 3 |
| Level | 1 |
| Pre-requisite | HKDSE Chemistry or Combined Science with Chemistry component Level 3; or ABCT1700 Introduction to Chemistry; or ABCT1D01 Chemistry and Modern Living. |
| Objectives | <ol style="list-style-type: none"> (1) To introduce a molecular perspective for understanding the natural world (2) To identify the fundamental principles underlying any physical and chemical changes of matters (3) To visualize the physical and chemical changes through the understanding of molecular behavior |
| Intended Learning Outcomes | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> (a) understand the macroscopic properties of the states of matters; (b) understand the basic principles of chemical energetics and equilibria; (c) apply and incorporate the chemical principles and knowledge learned to solve chemical problems and to appreciate modern applications in real life; (d) demonstrate the abilities in communication as well as skills in problem-solving and analytical thinking. |
| Contribution to Programme Outcomes (Refer to Part I Section 10) | Programme Outcome 1: Demonstrate an ability to apply knowledge of mathematics, science, and engineering appropriate to the Biomedical Engineering (BME) discipline. (Teach) |
| Subject Synopsis/ Indicative Syllabus | <p>Measurement in Chemistry: Significant figures; SI units; substances and mixtures; solution and concentration; mole and Avogadro's number; chemical reactions and balanced equations; temperature scales</p> <p>Principle of Chemical Equilibria: law of chemical equilibrium and equilibrium constant; Le Chatelier principle</p> <p>Acid-Base Equilibria in Aqueous Solutions: Acid and Base concepts, Ionization of water; pH, pOH and pK_w; acids and bases; polyprotic acids; buffers; solubility equilibria</p> <p>Solubility and Complex-Ion Equilibria: Solubility constants and solubility, common ion effects, precipitation, and equilibria involving complex ions</p> <p>Structures and Reactions of Organic Compounds: Organic compounds and structures, naming compounds, stereoisomerisms; functional groups of organic compounds; nucleophilic substitution reactions addition reactions of alkenes; electrophilic aromatic substitution; .</p> |

| Teaching/Learning Methodology | Lectures supplemented with guided reading will be used to introduce the key concepts of the topics. Home works or assignments would be given for students to enhance their learning. Tutorials will be arranged and students would be assigned in small groups for discussion. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|---|---|--|-----------------------------------|-------------|--|--|--|--|------------|---------|---|---|------------------------|-----|-------------|---------|---|---|--------------------------|-----|-----------------------------|---|---|---|-------|-------|--------------|---------|--|--|--|--|-----------------------------|---------|--|--|--|--|----------------------------|--|----------|--|--|--|
| Assessment Methods in Alignment with Intended Learning Outcomes | <table border="1" data-bbox="411 398 1382 808"> <thead> <tr> <th data-bbox="419 405 746 600" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="754 405 890 600" rowspan="2">% weighting</th> <th colspan="4" data-bbox="898 405 1374 533">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="898 544 1034 600">a</th> <th data-bbox="1042 544 1177 600">b</th> <th data-bbox="1185 544 1321 600">c</th> <th data-bbox="1329 544 1374 600">d</th> </tr> </thead> <tbody> <tr> <td data-bbox="419 611 746 667">1. written examination</td> <td data-bbox="754 611 890 667">50%</td> <td data-bbox="898 611 1034 667">√</td> <td data-bbox="1042 611 1177 667">√</td> <td data-bbox="1185 611 1321 667">√</td> <td data-bbox="1329 611 1374 667">√</td> </tr> <tr> <td data-bbox="419 678 746 734">2. continuous assessment</td> <td data-bbox="754 678 890 734">50%</td> <td data-bbox="898 678 1034 734">√</td> <td data-bbox="1042 678 1177 734">√</td> <td data-bbox="1185 678 1321 734">√</td> <td data-bbox="1329 678 1374 734">√</td> </tr> <tr> <td data-bbox="419 745 746 801">Total</td> <td data-bbox="754 745 890 801">100 %</td> <td colspan="4" data-bbox="898 745 1374 801"></td> </tr> </tbody> </table> | | | | | | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | a | b | c | d | 1. written examination | 50% | √ | √ | √ | √ | 2. continuous assessment | 50% | √ | √ | √ | √ | Total | 100 % | | | | | | | | | | | | | | | | | | |
| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | a | b | c | d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. written examination | 50% | √ | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. continuous assessment | 50% | √ | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Student Study Effort Expected | <table border="1" data-bbox="411 853 1473 1294"> <tbody> <tr> <td colspan="2" data-bbox="411 853 1082 909">Class contact:</td> <td colspan="4" data-bbox="1090 853 1473 909"></td> </tr> <tr> <td data-bbox="411 920 1082 976">▪ Lectures</td> <td colspan="5" data-bbox="1090 920 1473 976">26 Hrs.</td> </tr> <tr> <td data-bbox="411 987 1082 1043">▪ Tutorials</td> <td colspan="5" data-bbox="1090 987 1473 1043">13 Hrs.</td> </tr> <tr> <td colspan="2" data-bbox="411 1055 1082 1111">Other student study effort:</td> <td colspan="4" data-bbox="1090 1055 1473 1111"></td> </tr> <tr> <td data-bbox="411 1122 1082 1178">▪ Self-study</td> <td colspan="5" data-bbox="1090 1122 1473 1178">67 Hrs.</td> </tr> <tr> <td data-bbox="411 1189 1082 1245">▪ Home work and assignments</td> <td colspan="5" data-bbox="1090 1189 1473 1245">20 Hrs.</td> </tr> <tr> <td colspan="2" data-bbox="411 1256 1082 1305">Total student study effort</td> <td colspan="4" data-bbox="1090 1256 1473 1305">126 Hrs.</td> </tr> </tbody> </table> | | | | | | Class contact: | | | | | | ▪ Lectures | 26 Hrs. | | | | | ▪ Tutorials | 13 Hrs. | | | | | Other student study effort: | | | | | | ▪ Self-study | 67 Hrs. | | | | | ▪ Home work and assignments | 20 Hrs. | | | | | Total student study effort | | 126 Hrs. | | | |
| Class contact: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Lectures | 26 Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Tutorials | 13 Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other student study effort: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Self-study | 67 Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▪ Home work and assignments | 20 Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total student study effort | | 126 Hrs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reading List and References | <p data-bbox="411 1328 632 1361"><u>Essential reading</u></p> <p data-bbox="411 1395 1453 1462">Petrucci, Herring, Madura and Biossonnette, <i>General Chemistry: Principle and Modern Applications</i>, 11th edition, 2017, Pearson.</p> <p data-bbox="411 1518 1390 1585">All students are encouraged to buy the textbook, which will be used as texts for the duration of level 1 and level 2 studies in General Chemistry courses</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Subject Description Form

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|---|--|
| Subject Code | CLC2211P (2019-20 onward) CBS2211P (2018-19 and before) |
| Subject Title | Chinese Communication for Science Professionals 專業中文傳意（科學） |
| Credit Value | 2 |
| Level | 2 |
| Pre-requisite | Nil |
| Co-requisite | Nil |
| Exclusion | CLC2212P (Chinese Communication for Professionals of Applied Sciences) |
| Objectives | This subject aims at fostering students' communication skills and logical thinking abilities through trainings in reading, writing and speaking for the professional contact of Applied Science. |
| Intended Learning Outcomes <i>(Note 1)</i> | Upon completion of the subject, students will be able to: (a) develop analytical thinking skills for better organization and presentation of ideas; (b) consolidate the essential skills for writing fluent and organized articles in Chinese for daily communication and vocational purposes; (c) acquire the oral presentation skills for effective communication; (d) acquire the necessary methods for effective reading comprehension and critical thinking that would facilitate self-learning and life-long learning. |
| Subject Synopsis/ Indicative Syllabus <i>(Note 2)</i> | Indicative Contents: <ul style="list-style-type: none"> • Reading strategy and comprehension of texts general and professional for communication. • Structure of language and structure of ideas • Logical thinking and logical writings include expository writing and argumentative writing. • Organization of ideas and paragraphing letter, report, press release. • Accuracy and effectiveness in oral communications, presentation of power point proposal or working plan. |

| <p>Teaching/Learning Methodology</p> <p>(Note 3)</p> | <ul style="list-style-type: none"> Interactive seminars with reading and writing exercises, teaching students various instructive Chinese communication skills, group discussion, presentation drills; Pro-class self study is required with related reading and writing exercises; Teacher's consultation will be offered to the students depending on their individual need. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-----------------------------------|-------------|--|---|--|--|---|---|---|---|--|-----|---|---|--|---|---|-----|---|---|--|---|--|-----|--|---|---|--|-------------------------|------|---|---|---|---|----------|-----|---|---|--|---|-------|-------|--|--|--|--|
| <p>Assessment Methods in Alignment with Intended Learning Outcomes</p> <p>(Note 4)</p> | <table border="1" data-bbox="411 546 1337 1368"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>1). Assessment 1 (Chinese composition)</td> <td>20%</td> <td>√</td> <td>√</td> <td></td> <td>√</td> </tr> <tr> <td>2). Assessment 2 (Chinese proposal-Writing)</td> <td>20%</td> <td>√</td> <td>√</td> <td></td> <td>√</td> </tr> <tr> <td>3). Assessment 3 (Chinese proposal-Oral presentation & discussion)</td> <td>20%</td> <td></td> <td>√</td> <td>√</td> <td></td> </tr> <tr> <td>4). Class participation</td> <td>10 %</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>5). Quiz</td> <td>30%</td> <td>√</td> <td>√</td> <td></td> <td>√</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="4"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>The assessment includes criterion-referenced based quizzes, oral presentation & discussion, writing & reading comprehension test. It will evaluate students' writing communication skills, oral communication skills, pronunciation, vocabulary, colloquial expression vs. formal expression, writing and speaking achievement. The major assessment items include:</p> <ul style="list-style-type: none"> Oral presentation & discussion (assessing the ability to get stand in front of the audience to give a formal presentation which is expected to accurate, fluent, and in a rational & convincing way); Writing (assessing ability to realize the professional context and conventions written communication, and in expressing personal view accurately and clearly); | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | a | b | c | d | 1). Assessment 1 (Chinese composition) | 20% | √ | √ | | √ | 2). Assessment 2 (Chinese proposal-Writing) | 20% | √ | √ | | √ | 3). Assessment 3 (Chinese proposal-Oral presentation & discussion) | 20% | | √ | √ | | 4). Class participation | 10 % | √ | √ | √ | √ | 5). Quiz | 30% | √ | √ | | √ | Total | 100 % | | | | |
| Specific assessment methods/tasks | % weighting | | | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | a | b | c | d | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1). Assessment 1 (Chinese composition) | 20% | √ | √ | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2). Assessment 2 (Chinese proposal-Writing) | 20% | √ | √ | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3). Assessment 3 (Chinese proposal-Oral presentation & discussion) | 20% | | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4). Class participation | 10 % | √ | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5). Quiz | 30% | √ | √ | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|--------------------------------------|--|---------|
| | <ul style="list-style-type: none"> Reading (assessing ability to understand the theme and gist of an article quickly, and to judge the correctness and appropriateness of expressions for specific communication purpose, in particular contexts). | |
| Student Study Effort Required | Class contact: | |
| | <ul style="list-style-type: none"> Lectures & Seminars | 26 Hrs. |
| | Other student study effort: | |
| | <ul style="list-style-type: none"> outside class practice | 31 Hrs. |
| | <ul style="list-style-type: none"> self-study | 31 Hrs. |
| | Total student study effort | 88 Hrs. |
| Reading List and References | <p>司有和編著《科技寫作簡明教程》，安徽教育出版社，1984</p> <p>胡裕樹主編《大學寫作》，復旦大學出版社，1985</p> <p>林立、尹世超編著《科技語文》，冶金工業出版社，1986</p> <p>胡建玉編《讀書技巧》江西科學技術出版社，1991</p> <p>曾詳芹，韓雪屏主編《閱讀學原理》河南教育出版社，1992</p> <p>陳建民《說話的藝術》，語文出版社，1994</p> <p>李軍華《口才學》，華中理工大學出版社，1996</p> <p>黃葵，俞君立編著《閱讀學基礎》，武漢大學出版社，1996</p> <p>法定語文事務署《政府公文寫作手冊》，1996</p> <p>周錫馥編著《中文應用寫作教程》，三聯書店(香港)有限公司，1996</p> <p>香港城市大學語文學部編著《中文傳意寫作篇》，香港城市大學出版社，2001</p> <p>香港城市大學語文學部編著《中文傳意基礎篇》，香港城市大學出版社，2001</p> <p>盧丹懷、何寅、謝天振編著《中港應用文傳意大全》，香港商務印書館，2002</p> <p>于成鯤、陳瑞端、金振邦等主編《科教文與社交文書寫作典範》，復旦大學出版社，2011</p> | |

Subject Description Form

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|---|--|
| Subject Code | ELC3121 |
| Subject Title | English for Scientific Communication |
| Credit Value | 2 |
| Level | 3 |
| Pre-requisite | LCR English subjects |
| Objectives | <p>This subject aims to develop the English language and communication skills required by students to report and discuss scientific and technical studies in a range of written texts. The subject also aims to improve and develop their English language proficiency within a framework of scientific contexts.</p> <p>In striving to achieve the two interrelated objectives, attention will be given to developing the core competencies identified by the University as vital to the development of effective life-long learning strategies and skills.</p> |
| Intended Learning Outcomes <i>(Note 1)</i> | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. critique and synthesise sources in scientific and technical articles and reports, and b. report scientific information in writing to different audiences. <p>To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, select information critically, and present and support stance and opinion.</p> |
| Subject Synopsis/ Indicative Syllabus <i>(Note 2)</i> | <p>This syllabus is indicative. The balance of the components, and the corresponding weighting, will be based on the specific needs of the students.</p> <p>Written reports of scientific information Critiquing and synthesising sources; employing appropriate language, structure and style in a range of scientific writing for a variety of audiences; maintaining cohesion and coherence in scientific texts.</p> |
| Teaching/Learning Methodology <i>(Note 3)</i> | <p>The study method is primarily seminar-based. Activities include teacher input as well as individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. Students will be referred to information on the Internet and the ELC's Centre for Independent Language Learning.</p> <p>Learning materials developed by the English Language Centre are used throughout this course. Additional reference materials will be recommended as required.</p> |

| Assessment Methods in Alignment with Intended Learning Outcomes (Note 4) | <table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="2">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> </tr> </thead> <tbody> <tr> <td>1. First version of two technical texts for two different audiences</td> <td>50%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Final version of two technical texts for two different audiences</td> <td>50%</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td></td> <td></td> </tr> </tbody> </table> | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | a | b | 1. First version of two technical texts for two different audiences | 50% | ✓ | ✓ | 2. Final version of two technical texts for two different audiences | 50% | ✓ | ✓ | Total | 100 % | | |
|--|--|-----------------------------------|-------------|--|--|---|---|---|----------------------------|---------|---|---|-----|---|---|-------|-------|--|--|
| | Specific assessment methods/tasks | | | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | | | | | | | | |
| | | a | b | | | | | | | | | | | | | | | | |
| | 1. First version of two technical texts for two different audiences | 50% | ✓ | ✓ | | | | | | | | | | | | | | | |
| | 2. Final version of two technical texts for two different audiences | 50% | ✓ | ✓ | | | | | | | | | | | | | | | |
| Total | 100 % | | | | | | | | | | | | | | | | | | |
| <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>This subject adopts the method of 100% continuous assessment. Students' writing skills are evaluated through assessment tasks related to the learning outcome areas. Students are assessed on the accuracy and the appropriacy of the language used in fulfilling the assessment tasks, as well as the selection and organisation of ideas.</p> <p>Students will be assessed on technical texts targeted at different intended readers, including experts and non-experts in science and technology. This facilitates assessment of students' ability to select content and use language and style appropriate to the purposes and intended readers.</p> <p>A process writing approach will be used to raise students' awareness of the importance of drafting and editing in the writing process, and to assess their ability to edit texts based on feedback on the first version.</p> | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>Class contact:</td> <td></td> </tr> <tr> <td>Seminars</td> <td>26 Hrs.</td> </tr> <tr> <td>Other student study effort:</td> <td></td> </tr> <tr> <td>Classwork-related, assessment-related, and self-access work</td> <td>52 Hrs.</td> </tr> <tr> <td>Total student study effort</td> <td>78 Hrs.</td> </tr> </table> | Class contact: | | Seminars | 26 Hrs. | Other student study effort: | | Classwork-related, assessment-related, and self-access work | 52 Hrs. | Total student study effort | 78 Hrs. | | | | | | | | | |
| Class contact: | | | | | | | | | | | | | | | | | | | |
| Seminars | 26 Hrs. | | | | | | | | | | | | | | | | | | |
| Other student study effort: | | | | | | | | | | | | | | | | | | | |
| Classwork-related, assessment-related, and self-access work | 52 Hrs. | | | | | | | | | | | | | | | | | | |
| Total student study effort | 78 Hrs. | | | | | | | | | | | | | | | | | | |
| Reading List and References | <p>Required reading</p> <p>Course materials prepared by the English Language Centre</p> <p>Recommended readings</p> <p>Behrens, L. & Rosen, L. J. (2010). <i>A sequence for academic writing</i> (4th ed.). New York: Longman.</p> <p>Graff, G., Birkenstein, C and Durst, R. (2008). <i>They say/I say: The moves that matter in</i></p> | | | | | | | | | | | | | | | | | | |

academic writing. New York: W. W. Norton.

Ingre, D. (2003). *Technical writing: Essentials for the successful professional*. Mason, OH: Thomson.

Johnson, S. & Scott, J. (2009). *Study and communication skills for the biosciences*. Oxford: Oxford University Press.

Mulvaney, M. K. & Jolliffe, D. A. (2005). *Academic writing: Genres, samples, and resources*. New York: Pearson Longman.

Pickett, N.A., Laster, A.A. & Staples, K.E. (2001). *Technical English: Writing, reading, and speaking* (8th ed.). New York, NY: Longman.

VanAlstyne, J.S. & Tritt, M.D. (2002). *Professional and technical writing strategies: Communicating in technology and science*. Upper Saddle River, NJ: Prentice Hall.

Subject Description Form

| Subject Code | APSS1L01 | | | | | | | | | | | | | |
|--|--|------------------|----------------------------|-----------------------|------------------|------------------------|-----|----|------------------|----|-----|---------------|-----|----|
| Subject Title | Tomorrow's Leaders | | | | | | | | | | | | | |
| Credit Value | 3 | | | | | | | | | | | | | |
| Level | 1 | | | | | | | | | | | | | |
| GUR Requirements Intended to Fulfill | <p>This subject intends to fulfill the following requirement(s):</p> <p><input type="checkbox"/> Healthy Lifestyle</p> <p><input type="checkbox"/> Freshman Seminar</p> <p><input type="checkbox"/> Languages and Communication Requirement (LCR)</p> <p><input checked="" type="checkbox"/> Leadership and Intra-Personal Development</p> <p><input type="checkbox"/> Service-Learning</p> <p><input type="checkbox"/> Cluster-Area Requirement (CAR)</p> <p style="padding-left: 40px;"><input type="checkbox"/> Human Nature, Relations and Development</p> <p style="padding-left: 40px;"><input type="checkbox"/> Community, Organization and Globalization</p> <p style="padding-left: 40px;"><input type="checkbox"/> History, Cultures and World Views</p> <p style="padding-left: 40px;"><input type="checkbox"/> Science, Technology and Environment</p> <p><input type="checkbox"/> China-Study Requirement</p> <p style="padding-left: 40px;"><input type="checkbox"/> Yes or <input type="checkbox"/> No</p> <p><input type="checkbox"/> Writing and Reading Requirements</p> <p style="padding-left: 40px;"><input type="checkbox"/> English or <input type="checkbox"/> Chinese</p> | | | | | | | | | | | | | |
| Pre-requisite / Co-requisite/ Exclusion | Nil | | | | | | | | | | | | | |
| Assessment Methods | <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 33%;">100% Continuous Assessment</th> <th style="width: 33%;">Individual Assessment</th> <th style="width: 33%;">Group Assessment</th> </tr> </thead> <tbody> <tr> <td>1. Class Participation</td> <td>20%</td> <td>--</td> </tr> <tr> <td>2. Group Project</td> <td>--</td> <td>30%</td> </tr> <tr> <td>3. Term Paper</td> <td>50%</td> <td>--</td> </tr> </tbody> </table> <ul style="list-style-type: none"> The grade is calculated according to the percentage assigned; The completion and submission of all component assignments are required for passing the subject; and Student must pass all component(s) if he/she is to pass the subject. | | 100% Continuous Assessment | Individual Assessment | Group Assessment | 1. Class Participation | 20% | -- | 2. Group Project | -- | 30% | 3. Term Paper | 50% | -- |
| 100% Continuous Assessment | Individual Assessment | Group Assessment | | | | | | | | | | | | |
| 1. Class Participation | 20% | -- | | | | | | | | | | | | |
| 2. Group Project | -- | 30% | | | | | | | | | | | | |
| 3. Term Paper | 50% | -- | | | | | | | | | | | | |

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|---|---|
| Objectives | <p>The course is designed to enable students to learn and integrate theories, research and concepts of the basic personal qualities (particularly intrapersonal and interpersonal qualities) of effective leaders. This subject also intends to help students develop and reflect on their intrapersonal qualities, interpersonal qualities and connection of learning to oneself. Finally, the subject cultivates students' appreciation of the importance of intrapersonal and interpersonal qualities in effective leadership.</p> |
| Intended Learning Outcomes <i>(Note 1)</i> | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. understand and integrate theories, research and concepts on the basic qualities (particularly intrapersonal and interpersonal qualities) of effective leaders; b. develop self-awareness and self-understanding c. demonstrate self-leadership in pursuit of continual self-improvement; d. apply intrapersonal and interpersonal skills in daily lives; e. appreciate the importance of intrapersonal and interpersonal qualities in effective leadership, particularly the connection of learning in the subject to one's professional development and personal growth; f. recognize and accept their responsibility as professionals and citizens to the society and the world |
| Subject Synopsis/ Indicative Syllabus <i>(Note 2)</i> | <ol style="list-style-type: none"> 1. An overview of the personal attributes of effective leaders: roles of intrapersonal and interpersonal qualities in effective leadership and university graduates' employability in the service economy. 2. Self-leadership in effective leaders; the importance of self-understanding and self-management; life-long learning and leadership. 3. Social emotional competence I (intrapersonal domain): awareness and understanding of emotions; emotional management, roles of emotional awareness and management in effective leadership and career development. 4. Social emotional competence II (interpersonal domain): social awareness, relationship management, the application of social emotional competence in daily lives and in effective leadership. 5. Resilience and stress-coping: stresses faced by youth; resilience and life adversities; coping with life stresses; role of resilience in effective leadership. 6. Morality and integrity: moral competence; role of morality in effective leadership; ethical leadership; importance of moral competence in different professions. 7. Spirituality: connectedness to others, personal beliefs and values, meaning of life, spirituality and professional development, role of spirituality in effective leadership; spiritual practices in daily lives. 8. Cultural competence and global citizenship: cultural competence in a globalized world, global citizenship and effective leadership, |

| | | |
|--|-------|--|
| Total | 100 % | |
| <p>*assessment is based on group effort ^assessment is based on individual effort</p> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <ol style="list-style-type: none"> <li data-bbox="371 465 1289 1160">1. <u>Assessment of Class Participation (20%)</u>: It is expected that both online and classroom activities and preparation for lectures can help students understand the subject matter and oneself, develop social skills, connect learning to oneself and promote an appreciation of the importance of intrapersonal and interpersonal leadership qualities. Hence, marks for class participation (including the participation in e-learning modules) and preparation for lectures will be given. Students will be assessed by: a) preparation for class (e.g., complete e-learning modules, online assignment, and dig up materials before class), b) participation in class and online learning activities (e.g., completion of worksheets and sharing in class, participation in online discussion forum) and c) volunteering to answer questions and join discussions. Also, students will be invited to rate the performance and learning of other group members in an honest and authentic manner. The marks will reflect the mastery of knowledge, self-reflection and quality of interpersonal skills (such as collaboration with other members and contribution to the group) of the group members. Peer assessment will contribute to marks in class participation. <li data-bbox="371 1200 1289 1413">2. <u>Assessment of Group Project (30%)</u>: Group project presentation can give an indication of the students' understanding and integration of theories and concepts on personal qualities in effective leadership, personal and group reflections, interpersonal skills and degree of recognition of the importance of active pursuit of knowledge covered in the course. <li data-bbox="371 1453 1289 1666">3. <u>Assessment of Term Paper (50%)</u>: Individual paper can give an indication of the students' understanding and integration of theories and concepts on the personal qualities in effective leadership, self-assessment, self-reflection, connection of the subject matter to oneself and degree of recognition of the importance of active pursuit of knowledge covered in the course. <p>Based on the implementation of this subject in the past seven academic years (2012-2019), evaluation findings consistently showed that this subject was able to achieve the intended learning outcomes in the students. The positive evaluation findings are documented as follows:</p> <p style="padding-left: 40px;">Leung, H. (2016). Levels of reflection on teaching a leadership and positive youth development subject. <i>International Journal on Disability and Human Development</i> 15(2), 211-220.</p> <p style="padding-left: 40px;">Leung, H., Shek, D. T. L., & Mok, B. P. W. (2016). Post-lecture</p> | | |

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| | <p>leadership and intrapersonal development for university students in Hong Kong. <i>International Journal on Disability and Human Development</i>, 15(3), 339-345</p> <p>Yu. L., Shek, D. T. L., & Leung, E. Y. K. (2016). Post-lecture evaluation of a university subject on leadership and intrapersonal development. <i>International Journal of Child and Adolescent Health</i>, 9(2), 155-164.</p> <p>4. Quiz on National Security Law: Students are required to pass a quiz with multiple choice questions. Students can have multiple attempts in taking the quiz.</p> | |
| Student Study Effort Expected | Class contact: | |
| | <ul style="list-style-type: none"> ▪ Lectures and experiential/online learning activities | 39 Hrs. |
| | Other student study effort: | |
| | <ul style="list-style-type: none"> ▪ Group project preparation | 20 Hrs. |
| | <ul style="list-style-type: none"> ▪ Reading and writing term paper | 76 Hrs. |
| Reading List and References | <p>Basic References</p> <p>Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2002). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. <i>Prevention and Treatment</i>, 5(15), 1-106.</p> <p>Dalton, J., & Crosby, P. (2007). Being and having: Shouldn't excellence in higher education (and people) be a measure of what one does rather than what one has? <i>Journal of College and Character</i>, 9(1), 1-5.</p> <p>Davies, L. (2006). Global citizenship: abstraction or framework for action? <i>Educational review</i>, 58(1), 5-25.</p> <p>Dugan, J. P. (2006). Involvement and leadership: A descriptive analysis of socially responsible leadership. <i>Journal of College Student Development</i>, 47(3), 335-343.</p> <p>Dugan, J. P. (2015). The measurement of socially responsible leadership: Considerations in establishing psychometric rigor. <i>Journal of Educational, Cultural and Psychological Studies</i>, 12, 23-42.</p> <p>Hong Kong Government. (2020, July 7). The Law of the People's Republic of China on Safeguarding National Security in the Hong Kong Special Administrative Region. Available at https://www.isd.gov.hk/nationalsecurity/eng/pdf/NSL_QnA_Book.pdf.</p> <p>Gilley, A., Gilley, J. W., McConnell, C. W., & Veliquette, A. (2010). The competencies used by effective managers to build teams: An empirical study. <i>Advances in Developing Human Resources</i>, 12(1), 29-45.</p> <p>Goleman, D. (1995). <i>Emotional Intelligence: Why it can matter more</i></p> | |

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Appendix II: Grades and Codes for Subject Assessment

(a) Grades/codes to denote overall subject assessments (and subject components*, if deemed appropriate)

| Codes | Interpretation | Remarks |
|----------------|---|--|
| I [#] | Assessment to be completed | An incomplete grade must be converted to a regular grade normally in the following academic year at the latest. |
| N | Assessment is not required | |
| P | Pass on an ungraded subject | This code applies to an ungraded subject, such as industrial training. |
| U | Fail on an ungraded subject | This code applies to an ungraded subject, such as industrial training. |
| M | Pass with Merit | This code applies to all General Education subjects. The adoption or otherwise of this code to other subjects adopting a “Pass/Fail” grading system would be subject to the decision of individual Departments. The grade “Pass with Merit” can be awarded when the student’s work exceeds the subject learning outcomes in the majority of regards. |
| L | Subject to be continued in the following semester | This code applies to subjects like “Project” which may consist of more than 1 part (denoted by the same subject code) and for which continuous assessment is deemed appropriate. |
| S | Absent from all assessment components | - |
| W | Withdrawn from subject | Dropping of subjects after the add/drop period is normally not allowed. Requests for withdrawal from subjects after the add/drop period and prior to examination will only be considered under exceptional circumstances. This code is given when a student has obtained exceptional approval from department to withdraw from a subject after the “add/drop” period and prior to examination; otherwise, a failure grade (grade F) should be awarded. |
| Z | Exempted | - |
| T | Transfer of Credit | - |

[#]For cases where students fail marginally in one of the components within a subject, the Board of Examiners can defer making a final decision until the students concerned have completed the necessary remedial work to the satisfaction of the subject examiner(s). The students can be assigned an “I” code in this circumstance.

Note : Subjects with the assigned codes I, N, P, U, M, L, W, Z and T (if the subject is without grade transferred) will be omitted in the calculation of the GPA. A subject assigned code S will be taken as zero in the calculation.

Appendix III: Codes for Final Assessment

| Final assessment code | Interpretation |
|-----------------------|---|
| A | 1st Class Hons |
| B | 2nd Class (Division 1) Hons |
| C | 2nd Class (Division 2) Hons |
| D | 3rd Class Hons |
| K | Pass without Hons |
| E | Required to be de-registered because of failure to meet requirements. |
| J | University award not applicable, e.g. exchange-in students. |
| N | Suspension of study due to disciplinary action. |
| T | Eligible to progress. |
| U | Expulsion due to disciplinary action. |
| W | Required to be de-registered because of withdrawal/absence. |
| X | Pending fulfilment of requirements for award. |

Appendix IV: Language and Communication Requirements (LCR)

English

All undergraduate students must successfully complete two 3-credit English language subjects as stipulated by the University, according to their English language proficiency level (Table 1). These subjects are designed to suit students' different levels of English language proficiency at entry, as determined by their HKDSE score or the English Language Centre (ELC) entry assessment (when no HKDSE score is available, e.g. in the case of non-local students).

Table 1: Framework of English LCR subjects

| English language competence level/ Subject | <i>Practical English for University Studies</i> | <i>English for University Studies</i> | Any LCR Proficient level elective subject in English (Table B) |
|---|---|---------------------------------------|--|
| HKDSE Level 4 and above or equivalent | -- | Subject 1 | Subject 2 |
| HKDSE Level 3 or equivalent | Subject 1 | Subject 2 | -- |

Table 2: Proficient level elective subjects for DSE Level 4 students and above (or equivalent) (each 3 credits)

| | |
|--|--|
| LCR Proficient level elective subjects | <i>Advanced English for University Studies</i> |
| | <i>Advanced English Reading and Writing Skills</i> |
| | <i>English in Literature and Film</i> |
| | <i>Persuasive Communication</i> |

Chinese

All undergraduate students are required to successfully complete one 3-credit Chinese language subject as stipulated by the University, according to their Chinese language proficiency level (Table 3).

Table C: Chinese LCR subjects

| Categories of students | Required subject |
|--|---|
| For Chinese speaking students | University Chinese (Cantonese or Putonghua version) |
| For non-Chinese speakers or students whose Chinese standards | One subject from Table D below |

| | |
|--|--|
| are at junior secondary level or below | |
|--|--|

Table D: Chinese LCR subjects for non-Chinese speakers or students whose Chinese standards are at junior secondary level or below

| Subject (3 credits) | Pre-requisite/exclusion |
|--|--|
| Chinese I (for non-Chinese speaking students) | For non-Chinese speaking students at beginners' level |
| Chinese II (for non-Chinese speaking students) | <ul style="list-style-type: none"> • For non-Chinese speaking students; and • Students who have completed Chinese I or equivalent |
| Chinese III (for non-Chinese speaking students) | <ul style="list-style-type: none"> • For non-Chinese speaking students at higher competence levels; and • Students who have completed Chinese II or equivalent |
| Chinese IV (for Non-Chinese speaking students) | <ul style="list-style-type: none"> • For non-Chinese students at intermediate competence levels; and • Students who have completed Chinese III or equivalent |
| Chinese Literature – Linguistics and Cultural Perspectives (for non-Chinese speaking students) | For non-Chinese speaking students at higher competence levels |

Reading and Writing Requirements

See relevant information under the Cluster-Area Requirement in Appendix V. Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be, by default, exempted from the Reading and Writing Requirements in Chinese.

Appendix V: Cluster Areas Requirement

Cluster-Area Requirements (CAR) for students

Students have to choose and successfully complete a total of 12 credits from CAR subjects according to their own interests, with 3 credits to be selected from each of the following 4 cluster areas:

- Human Nature, Relations and Development
- Community, Organisation and Globalisation
- History, Culture and World Views
- Science, Technology and Environment

Reading and Writing Requirements

To enhance students' literacy skills in reading and writing, the Senate-approved framework also stipulates that students must, among the CAR subjects they take, pass one subject that includes the requirement for a substantive piece of writing in English (EW Requirement) and one subject with the requirement of a substantive piece of writing in Chinese (CW Requirement). Subjects approved for meeting the Writing Requirement will be given a "W" designation.

They must also, among the CAR subjects they take, pass one subject that includes the requirement for the reading of an extensive text in English (ER Requirement) and one subject with the requirement for the reading of an extensive text in Chinese (CR Requirement). Subjects approved for meeting the Reading Requirement will be given an "R" designation.

Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be, by default, exempted from the Reading and Writing Requirements in Chinese.

China-Study Requirement

To enable students to develop a deeper understanding of China (i.e., its history, culture and society, as well as emerging issues or challenges), students are further required to complete at least 3 credits of CAR subjects which are designated as "China-related" from any of the four Cluster Areas.

Double Fulfilment of DSR and CAR

ABCT1101 Introductory Life Science is also designated as a CAR subject under Cluster Area Requirement **CAR-D**. This is the same subject, but designated with a different subject code. Students passing ABCT1101 Introductory Life Science will be regarded as having fulfilled the credit requirements of the DSR. They are required to take another subject in **Cluster Area D** in order to meet the graduation requirement.