

THE HONG KONG POLYTECHNIC UNIVERSITY



DEPARTMENT OF APPLIED PHYSICS

PROGRAMME REQUIREMENT DOCUMENT

OF

HIGHER DIPLOMA IN APPLIED PHYSICS

(Code: 11341)

Intake Cohort 202/22

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1. GENERAL INFORMATION

Programme Title	:	Higher Diploma in Applied Physics
Programme Code	:	11341
Host Department	:	Department of Applied Physics
Mode of Study	:	Full-time
Duration	:	2 years (normal)
Medium of Instruction	:	English
Entry Qualification	:	HKDSE (Hong Kong Diploma of Secondary Education) or equivalent
Credits Required for Graduation	:	At least 62 credits, depending on the student's attainment of HKDSE
Final Award	:	Higher Diploma in Applied Physics 應用物理學高級文憑

2. PROGRAMME AIMS AND PROGRAMME OUTCOMES

2.1 Programme Aims

The Programme aims at providing students with training in Applied Physics, Instrumentation, and Materials Science with emphasis on applications, in addition to generic skills for professional and personal development.

2.2 Programme Outcomes

Programme outcomes refer 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 Higher Diploma Programmes (UILO)¹, as indicated below.

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

2.2.1 Category A - Professional/academic knowledge and skills

Upon graduation from the Programme students will be able to:

- A1 apply knowledge in physics to technological devices and processes,
- A2 apply knowledge in instrumentation to the development and servicing of sophisticated equipment,
- A3 differentiate among different types of materials, including ceramics, plastics and metals, and processes so as to enable them to make judgement in the selection, specification and processing of materials,
- A4 apply their knowledge and experimental skills in physics, instrumentation, and materials science to perform product testing and certification,
- A5 make use of foundation knowledge in physics, instrumentation, materials science and related disciplines for professional development in science and engineering.

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

2.2.2 Category B - Attributes for all-roundedness

Upon graduation from the Programme students are expected to possess the following attributes:

Outcomes	Attributes	UILOs*
B1	be able to analyze, evaluate, synthesize and propose solutions to problems of a general nature, with innovative/creative ideas where appropriate;	CT
<u>B2a</u>	be able to communicate clearly and effectively in English;	EC
<u>B2b</u>	be able to communicate clearly and effectively in Chinese, including Cantonese and Putonghua;	
B3	be able to collaborate smoothly with others in team work, to demonstrate a sense of responsibility, accountability, leadership and team spirit;	PPS
B4	possess a desire for life-long learning and self-learning; and	LL
B5	possess a global outlook and an understanding of China Mainland in comparison with Hong Kong.	EC

* *CT: Critical Thinker; EC: Effective Communicator; PPS: Practical Problem Solver; LL: Lifelong Learner; EC: Ethical Citizen.*

Learning Outcomes in this Category map to the UILOs of ‘Critical Thinker’, ‘Effective Communicator’, ‘Practical Problem Solver’, ‘Lifelong Learner’ and ‘Ethical Citizen’ as indicated in the table above.

While many of these graduate attributes can be developed through the curricular activities of this Programme, some as listed above 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.

3. ENTRANCE REQUIREMENTS

In addition to the General Minimum Entrance Requirements of The Hong Kong Polytechnic University for 2-year full-time Higher Diploma programme, the specific requirements of this programme are as follows:

For those applying on the basis of HKDSE, the subject requirements are:

- 5 subjects at level 2 including English Language and Chinese Language.
- The elective subjects should preferably be Physics, Mathematics, Chemistry and Combined Science.
- Besides, applicants should preferably have studied any one of the extended modules in mathematics.

For those applying on the basis of other qualifications, the specified qualifications are:

- Diploma in Computer & Communications Engineering, Computer & Information Engineering, Electrical Engineering, Electronic & Communications Engineering, Industrial Engineering & Information Management, Manufacturing Engineering, Manufacturing Engineering Management, Mechanical Engineering, Product Engineering Design & Technology Management, Production & Industrial Engineering, Telecommunications Engineering or equivalent.

4. THE CREDIT-BASED PROGRAMME

- 4.1 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.
- 4.2 Under the credit-based system, the University academic year consists of two teaching semesters, each of thirteen weeks, plus a Summer Term of seven weeks’ duration.

- 4.3 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” section).

5. CURRICULUM OF HIGHER DIPLOMA IN APPLIED PHYSICS

- Minimum credit requirement for graduation is 62 credits. Out of these 62 credits, 15 credits are General University Requirements (GUR) including 9 credits of Language and Communication Requirements (LCR) and 6 credits of Cluster-Area Requirements (CAR).
- Both Work-integrated Education (WIE) and Co-curricula Activity Requirements are not mandatory.
- Language and Communication Requirements for Higher Diploma Programme (HDLCR)

1. HDLCR - English

Students in Higher Diploma programmes are required to successfully complete two English language subjects with reference to their attainments in HKDSE English Language or HKALE Use of English.

Students entering with the following HKDSE results are required to take two 3-credit HDLCR English subjects:

- HKDSE Level 2
- HKDSE Level 3 with any sub-score below Level 3

These two subjects will help students with tertiary study in the English medium and prepare them for the workplace. Upon completion of these English language subjects, students should be brought up to a level at which they are eligible for taking the LCR English subjects at the bachelor’s degree level. In addition, students will be given an option of taking two additional LCR English subjects at the bachelor’s degree level (during their HD studies) to facilitate their future articulation to bachelor’s degree programmes.

Students entering with the following HKDSE results are required to take LCR English subjects at the bachelors’ degree level according to their level of English language proficiency at entry:

- HKDSE Level 3 with no sub-score below Level 3
- above HKDSE Level 3

2. HDLCR - Chinese

Students in Higher Diploma programmes are required to successfully complete one Chinese language subject with reference to their attainments in HKDSE Chinese language.

Students entering with the following HKDSE results are required to take one 3-credit HDLCR Chinese subject:

- HKDSE Level 2
- HKDSE Level 3 with any sub-score below Level 3

This subject will help prepare students for the workplace as well as for the articulation to bachelor's degree programmes. Upon completion of the Chinese language subject, students should be brought up to a level at which they are eligible for taking the LCR Chinese subject at the bachelor's degree level. In addition, students will be given an option of taking one additional LCR Chinese subject at the bachelor's degree level (during their HD studies) to facilitate their future articulation to bachelor's degree programmes.

Students entering with the following HKDSE results are required to take LCR Chinese subject at the bachelors' degree level according to their level of Chinese language proficiency at entry:

- HKDSE Level 3 with no sub-score below Level 3
- above HKDSE Level 3

- Cluster-Area Requirements

Students have to choose and successfully complete a total of 6 credits from CAR subjects according to their own interests, from 2 of the following Cluster Areas:

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

- 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.

Stage/ Semester	Subject Code	Subject	Credit	Compulsory/ Elective
1/1	AP10005	Physics I #	3	C
1/1 & 1/2	AMA1007	Calculus and Linear Algebra*	3	C
1/1	ABCT1101 ABCT1700	Introductory Life Science % Introduction to Chemistry &	3 3	C
1/1		CAR I (GUR)	3	C
1/1		English I (GUR)	3	C
1/1 & 1/2	AMA1006	Basic Statistics	2	C
1/2	AP10006	Physics II#	3	C
1/2	AP10007	Applied Physics Laboratory	3	C
1/2	ABCT1741 ABCT1102	General Chemistry I & General Biology %	3 3	C
1/2		English II (GUR)	3	C
1/2		Chinese (GUR)	3	C
2/1	AP20001/ AP20016	Electromagnetism/ Electromagnetism and Waves	3	C
2/1	AP20003/ AP20017	Mechanics/ Mechanics and Robotic Motion	3	C
2/1	AP20007/ ISE204	Fundamentals of Scientific Instrumentation/ Instrumentation and Product Testing	3	C
2/1	AP20005/ COMP1012	Programming in Physics/ Programming Fundamentals and Applications	3	C
2/1	AMA2882	Mathematics for Scientists and Engineers	4	C
2/1		CAR II (GUR)	3	C
2/2	AP20002	Materials Science	3	C
2/2	AP20008/ COMP2013	Waves/ Data Structures and Algorithms	3	C
2/2	AP20012	Computer-based Automation	3	C
2/2	AP20014	Innovation Project	2	C
Total:			62	

GUR - General University Requirement

Notes:

For those applying on the basis of HKDSE

- # **Students who have not attained Level 3 or above in Physics in HKDSE are required to take Introduction to Physics (AP10001) as an underpinning subject before taking Physics I (AP10005) & Physics II (AP10006). The 3 credits earned from AP10001 will not be counted towards the minimum number of credits required for graduation.**

- * **Students who have not attained Level 2 or above in Mathematics Extended Module M1 or M2 will be required to take the Foundation Mathematics (AMA1100) before taking Calculus & Linear Algebra (AMA1007) and Basic Statistics (AMA1006). AMA1100 is an underpinning subject. The 2 credits earned from AMA1100 will not be counted towards the minimum number of credits required for graduation.**

- % **Students who have not attained Level 3 or above in Biology (either specialized science subject or Combined Science) in HKDSE are required to take Introductory Life Science (ABCT1101) instead of taking General Biology (ABCT1102). Students with Level 3 or above are required to take General Biology (ABCT1102). Students who have failed ABCT1102 can take ABCT1101 as replacement.**

- & **Students who have not attained Level 3 or above in Chemistry (either specialized science subject or Combined Science) in HKDSE are required to take Introduction to Chemistry (ABCT1700) instead of taking General Chemistry I (ABCT1741). Students with Level 3 or above are required to take General Chemistry I (ABCT1741). Students who have failed ABCT1741 can take ABCT1700 as replacement.**

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

	Sem 1			Sem 2		
	Subject		Credit	Subject		Credit
Year 1	AP10005 Physics I #	DSR	3	AP10007 Applied Physics Laboratory	DSR	3
	AMA1006 Basic Statistics	DSR	2	AP10006 Physics II	DSR	3
	AMA1007 Calculus and Linear Algebra*	DSR	3	ABCT1741 General Chemistry I and/or ABCT1102 General Biology	DSR	0-6%&
	ABCT1101 Introductory Life Science ABCT1700 Introduction to Chemistry	DSR	0-6%&	English II	GUR	3
	CAR I	GUR	3	Chinese	GUR	3
	English I	GUR	3			
	Subtotal			14-20	Subtotal	

	Sem 1			Sem 2		
	Subject		Credit	Subject		Credit
Year 2	AP20001/ AP20016 Electromagnetism/ Electromagnetism and Waves	DSR	3	AP20002 Materials Science	DSR	3
	AP20003/ AP20017 Mechanics/ Mechanics and Robotic Motion	DSR	3	AP20008/ COMP2013 Waves/ Data Structures and Algorithms	DSR	3
	AP20005/ COMP1012 Programming in Physics/ Programming Fundamentals and Applications	DSR	3	AP20012 Computer-based Automation	DSR	3
	AP20007/ ISE204 Fundamentals of Scientific Instrumentation/ Instrumentation and Product Testing	DSR	3	AP20014	DSR	2
	AMA2882 Mathematics for Scientists and Engineers	DSR	4			
	CAR II	GUR	3			
	Subtotal			19	Subtotal	

Summary of the credit requirements for different subject areas

(a)	Language and Communication Requirements	9 credits
(b)	Cluster Areas Requirements (CAR)	6 credits
(c)	China Studies Requirement	(3 of the 6 CAR credits)
(d)	Discipline-Specific Requirements (DSR)	47 credits
	Total	62 credits

6. 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 “Programme outcomes” section).

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				I	
AP10005 Physics I		A			I	I	I				I	
AP10006 Physics II		A			I	I	I				I	
AP10007 Applied Physics Laboratory		A	A	I		I	I	I		I	I	
AP20001/ AP20016 Electromagnetism/ Electromagnetism and Waves		A		R			I	A			R	
AP20002 Materials Science		A		A	R	R	I	I			R	
AP20003/ AP20017 Mechanics/ Mechanics and Robotic Motion		A				R	R	R			R	
AP20005/ COMP1012 Programming in Physics/ Programming Fundamentals and Applications		A			R		R	R	I		R	
AP20007/ ISE204 Fundamentals of Scientific Instrumentation/ Instrumentation and Product Testing		A	R		R	R	A	R		R	R	
AP20008/ COMP2013 Waves/ Data Structures and Algorithms		R				R	A	R				
AP20012 Computer-based Automation		A	A		A	R	A			R	R	
AP20014 Innovative Project		A	A	A	A	A	A	R		A	R	R
English I (GUR)								A			I	
English II (GUR)								A			R	
Chinese (GUR)									R/A		R	
CAR I (GUR)											I	
CAR II (GUR)									R		R	I
AMA1007 Calculus and Linear Algebra					I							
AMA1006 Basic Statistics					I							
AMA2882 Mathematics for Scientists and Engineers					R							

Subjects	Programme outcomes	A1	A2	A3	A4	A5	B1	B2a	B2b	B3	B4	B5
ABCT1101 Introductory Life Science						I		I			I	
ABCT1102 General Biology						I		I			I	
ABCT1700 Introduction to Chemistry						I		I			I	
ABCT1741 General Chemistry I						I		I			I	

7. REGISTRATION

7.1 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

8. NORMAL DURATION FOR COMPLETION OF THE PROGRAMME

8.1 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.

8.2 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/Deans of Independent School. Applications for extension of study period beyond one year and up to two years will require the approval from Faculty/School Board Chairman.

8.3 Students who have exceeded the normal duration of the programme for more than two years 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.

9. ASSESSMENT AND PROGRESSION

9.1 Assessment methods

9.1.1 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.

- 9.1.2 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 component 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.
- 9.1.3 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.
- 9.1.4 At the beginning of each semester, each subject teacher should inform students of the details of the assessment methods to be used.
- 9.1.5 The Board of Examiners (the role of the Board of Examiners, please refer to University document "Academic Regulations and Procedures for Credit-based Programmes", Section B.4) is appointed to deal with special cases arising from assessment and classification of awards.

9.2 Progression

- 9.2.1 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.
- 9.2.2 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 for that programme, 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 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.

- 9.2.3 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.
- 9.2.4 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.
- 9.2.5 A student may be de-registered from the programme enrolled before the time frame specified in Sections 9.2.2 (iii) or 9.2.2 (iv) above if his/her academic performance is poor to the extent that the Board of Examiners deems that his/her chance of attaining a GPA of 1.70 at the end of the programme is slim or impossible.
- 9.2.6 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/Schools/Departments will be sought and made available to AAC for reference.

9.3 Retaking of subjects

- 9.3.1 Students may only retake a subject which they have failed (i.e. Grade F or S or U).
- 9.3.2 Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded.
- 9.3.3 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
- 9.3.4 In cases 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.³
- 9.3.5 Students need to submit a request to the Faculty/School Board for the second retake of a failed subject.
- 9.3.6 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

- 9.3.7 In relation to 9.3.6 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.

9.4 Exceptional circumstances

Absence from an assessment component

- 9.4.1 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 Lecturer concerned, in consultation with the Programme Leader.

Other particular circumstances

- 9.4.2 A student’s particular circumstances may influence the procedures for assessment but not the standard of performance expected in assessment.

9.5 Grading

- 9.5.1 Assessment grades shall be awarded on a criterion-referenced basis. A student’s overall performance in a subject shall be 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.
+	The student consistently performed at this level and exceeded the

(exemplary)	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+

9.5.2 At the end of each semester/term, 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.

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

9.6 Misconducts

9.6.1 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.

9.6.2 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.

9.6.3 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.

10. FINAL AWARD

10.1 Graduation requirements

10.1.1 A student would be eligible for award of a Higher Diploma in Applied Physics if he/she satisfies all the conditions listed below:

- (i) Accumulation of the requisite at least 62 credits;
- (ii) Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award;
- (iii) Having a GPA of 1.70 or above at the end of the Programme.
- (iv) Satisfying the following General University Requirements (GUR):

Area	Credits
HD Language and Communication Requirements (6 credits in English & 3 credits in Chinese)	9
Custer-Area Requirements (CAR)	6
Total GUR credits	15

10.1.2 A student is required to graduate as soon as he/she satisfies all the conditions for award (see paragraph above). He/she may take additional subjects as described in the “Subject registration” section in or before the semester within which he/she becomes eligible for award.

10.2 Guidelines for award classification

10.2.1 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.

10.2.2 The Weighted Grade Point Average is defined as follows:

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

where W_n = weighting to be assigned according to the level of the subject
 For this Programme,

$$W_i = \begin{cases} 0.4 & \text{for Level I subjects} \\ 0.6 & \text{for Level II subjects} \end{cases}$$

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

n = number of all subject counted in GPA calculation as set out in section 8.5.2, except those exclusions specified in sections 9.2.2 and 9.2.3

10.2.3 Any subjects passed after the graduation requirement has been met will not be taken into account of in the GPA or Weighted GPA calculations for award classification.

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

<u>Award Classification</u>	<u>Guidelines</u>
Distinction	The student's performance/attainment is outstanding, and identifies him as exceptionally able in the field covered by the Programme.
Credit	The student has reached a standard of performance/attainment which is more than satisfactory but less than outstanding.
Pass	The student has reached a standard of performance/attainment ranging from just adequate to satisfactory.

10.3 *Aegrotat award*

10.3.1 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/her 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.

10.3.2 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.

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

10.3.4 An aegrotat award shall normally not be classified, and the award parchment shall not state that it is an aegrotat award.

11. 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.

12. UNIVERSITY REGULATIONS

The regulations in this document are only for those which apply specifically to the “Higher Diploma in Applied Physics”. Students should consult the current issue of the “Student Handbook” for the General Regulations of the University.

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

13. AMENDMENTS

This Definitive Programme 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.

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	Lecture and 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
AP20007	Fundamentals of Scientific Instrumentation	3	Nil	Lecture and laboratory	Continuous assessment, practical test and examination
AP20008	Waves	3	AP10006	Lecture and tutorial	Continuous assessment and examination
AP20012	Computer-based Automation	3	Nil	Lecture and laboratory	Continuous assessment, practical test and written examination
AP20014	Innovation Project	2	Nil	Presentations	Continuous assessment, Project report and oral (final)
AP20016	Electromagnetism and Waves	3	Nil	Lecture and tutorial	Continuous assessment and examination
AP20017	Mechanics and Robotic Motion	3	AP10005	Lecture, tutorial and laboratory	Continuous assessment and examination
ABCT1101	Introductory Life Science	3	Nil	Lecture, tutorial and self-study	Written assessment and examination
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

Subject Code	Subject Name	Credit	Pre-requisite	Teaching Methods	Assessment Methods
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
COMP1012	Programming Fundamentals and Applications	3	Nil	Lecture and laboratory	Continuous assessment and examination
COMP2013	Data Structures and Algorithms	3	COMP1011/ COMP1012/ ENG2002/L GT3109 & AMA1110/A MA1501/A MA2634 & AMA2111/A MA1751	Lecture, tutorial and laboratory	Exercises, Programming Project, Test, Examination
ISE204	Instrumentation and Product Testing	3	AP10001	Lecture, tutorial, laboratory and case study	Quizzes, Laboratory exercises / Case study, Mid-term test and Final examination

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	<p>Upon completion of the subject, students will be able to:</p> <p>(a) have a basic understanding of the biological world</p> <p>(b) appreciate the importance of the biological world to human</p> <p>(c) appreciate the recent biotechnological advancement and their impacts</p>	
Subject Synopsis/ Indicative Syllabus	<p>The different forms of biological organisms:</p> <p>(1) Viruses, Bacteria, Protozoa, Algae, Fungi, Plants, Animals</p> <p>(2) The involvement of these different organisms in our daily life</p> <p>(3) The importance of ecology and biodiversity to human</p> <p>The cell:</p> <p>(1) The building blocks of biological organisms</p> <p>(2) Structure and functions</p> <p>(3) Different types of cells</p> <p>(4) Cell division and proliferation</p> <p>The heredity:</p> <p>(1) The genetic material</p> <p>(2) The genetic information in the form of genes</p> <p>(3) The expression of the genetic information</p> <p>(4) The passing of genetic information to offspring</p> <p>The organization and functions of complex biological organisms:</p> <p>(1) The structure and functions of plants</p> <p>(2) The importance of plants to human</p> <p>(3) The structure and functions of animals – human as an example</p> <p>(4) Organization of tissues, organs and functional systems in human</p> <p>Modern biotechnology:</p> <p>(1) Major developments:</p> <p>(a) <i>In vitro</i> fertilization</p> <p>(b) Gene cloning</p> <p>(c) GM foods</p>	<p>Contact Hours</p> <p>1 Hr</p> <p>1 Hr</p> <p>1 Hr</p> <p>1 Hr</p> <p>2 Hrs</p> <p>1 Hr</p> <p>2 Hrs</p> <p>2 Hrs</p> <p>2 Hrs</p> <p>1 Hr</p> <p>2 Hrs</p> <p>2 Hrs</p> <p>2 Hrs</p> <p>1 Hr</p> <p>1 Hr</p> <p>1 Hr</p> <p>5 Hrs</p> <p>1 Hr</p> <p>2 Hrs</p> <p>2 Hrs</p>

	(d) GM organisms 2 Hrs (e) Gene therapy 1 Hr (f) Stem cell therapy 1 Hr (g) Human genome project 2 Hrs (h) Human cloning 1 Hr (2) Their impacts on our life, present and future, and the environment 2 Hrs (3) Ethical, social and legal issues 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			
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Reading List and References																																		

Subject Description Form

Subject Code	ABCT1102																																																
Subject Title	General Biology																																																
Credit Value	3																																																
Level	1																																																
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: ABCT 1101, or completed HKSD level 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	Upon completion of the subject, students will be able to: (a) have a basic understanding of the structure and functions of the cell; (b) have a basic understanding of genetics and inheritance; (c) have a basic understanding of the structure and function of animals; (d) have a basic understanding of the structure and function of plants; and (e) appreciate the importance of evolution and biological diversity.																																																
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 colspan="2">THE CELL:</td> </tr> <tr> <td>Molecules and structure of the cell</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Activities inside the cell</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Harvesting chemical energy in the cell</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Photosynthesis: Harvesting light energy and producing food</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td colspan="2"> CELLULAR REPRODUCTION AND GENETICS</td> </tr> <tr> <td>Reproduction and inheritance at the cellular level</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Patterns of inheritance</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Molecular biology of the gene</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Gene control</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>DNA technology and genomics</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td colspan="2"> EVOLUTION AND BIOLOGICAL DIVERSITY</td> </tr> <tr> <td>The origin and evolution of microbial life: Prokaryotes and protists</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Plants, fungi, and the colonization of Land</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Invertebrate diversity</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Vertebrate diversity</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td colspan="2"> ANIMALS: FORM AND FUNCTION</td> </tr> <tr> <td>Unifying concepts of animal structure and function</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Nutrition and digestion</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Gas exchange and circulation</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Control of body temperature and water balance</td> <td style="text-align: right;">2 Hrs</td> </tr> <tr> <td>Hormones and the endocrine system</td> <td style="text-align: right;">1 Hr</td> </tr> <tr> <td>Reproduction</td> <td style="text-align: right;">1 Hr</td> </tr> </tbody> </table>		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	 ANIMALS: FORM AND FUNCTION		Unifying concepts of animal structure and function	1 Hr	Nutrition and digestion	1 Hr	Gas exchange and circulation	1 Hr	Control of body temperature and water balance	2 Hrs	Hormones and the endocrine system	1 Hr	Reproduction	1 Hr
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	The biosphere	1 Hr																																																		
	Behavioral adaptations to the environment	1 Hr																																																		
	Population ecology	1 Hr																																																		
	Communities and ecosystems	1 Hr																																																		
	Conservation biology	1 Hr																																																		
Teaching/Learning Methodology	Lectures Tutorials with exercises and discussions Self Study																																																			
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	• Lectures	28 h																																																		
	• Tutorials	13 h																																																		
	Other student study effort:																																																			
	• Self Study	72 h																																																		
	Total student study effort	111 h																																																		
Reading List and References	<p><u>Text book:</u> Campbell Biology: Concepts and Connections, 7/E Jane B. Reece, Martha R. Taylor, Eric J. Simon, Jean L. Dickey Pearson 2012</p> <p><u>Reference:</u> Essentials of Biology, 3/E Sylvia S. Mader McGraw-Hill 2012</p>																																																			

Subject Description Form

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. 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: (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 can develop a deeper understanding of the subject through group discussion and self-study.</p>

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

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	(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	Upon completion of the subject, students will be able to: (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. Homework 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="443 389 1493 721"> <thead> <tr> <th data-bbox="443 389 836 510" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="836 389 995 510" rowspan="2">% weighting</th> <th colspan="4" data-bbox="995 389 1493 510">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="995 510 1117 555">a</th> <th data-bbox="1117 510 1251 555">b</th> <th data-bbox="1251 510 1362 555">c</th> <th data-bbox="1362 510 1493 555">d</th> </tr> </thead> <tbody> <tr> <td data-bbox="443 555 836 613">(1) Written Examination</td> <td data-bbox="836 555 995 613">50</td> <td data-bbox="995 555 1117 613">✓</td> <td data-bbox="1117 555 1251 613">✓</td> <td data-bbox="1251 555 1362 613">✓</td> <td data-bbox="1362 555 1493 613">✓</td> </tr> <tr> <td data-bbox="443 613 836 672">(2) Continuous Assessment</td> <td data-bbox="836 613 995 672">50</td> <td data-bbox="995 613 1117 672">✓</td> <td data-bbox="1117 613 1251 672">✓</td> <td data-bbox="1251 613 1362 672">✓</td> <td data-bbox="1362 613 1493 672">✓</td> </tr> <tr> <td data-bbox="443 672 836 721">Total</td> <td data-bbox="836 672 995 721">100</td> <td colspan="4" data-bbox="995 672 1493 721"></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				
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(2) Continuous Assessment	50	✓	✓	✓	✓																												
Total	100																																
Student Study Effort Expected	Class contact:																																
	▪ Lectures		26 Hrs.																														
	▪ Tutorials		13 Hrs.																														
	Other student study effort:																																
	▪ Self-study		67 Hrs.																														
	▪ Homework and assignments		20 Hrs.																														
	Total student study effort		126 Hrs.																														
Reading List and References	<p data-bbox="443 1348 663 1379"><u>Essential reading</u></p> <p data-bbox="443 1411 1484 1478">Petrucci, Herring, Madura and Biossonnette, <i>General Chemistry: Principle and Modern Applications</i>, 10th edition, 2011, Pearson</p> <p data-bbox="443 1509 1426 1576">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>																																

Appendix II: Grades and Codes for Subject Assessment

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

Codes	<u>Interpretation</u>	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 an ungraded subject	This code applies to an ungraded subject, such as industrial training.
U	Fail 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 for intake cohorts before 2010/11. 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 assessment	—
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	—

* Entry of grades/codes for subject components is optional.

For cases where students fail marginally in one of the components within a subject, the BoE 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	
	Honours Degree programmes	All other programmes
A	1st Class Hons	Pass with distinction
B	2nd Class (Division 1) Hons	Pass with credit
C	2nd Class (Division 2) Hons	----
D	3rd Class Hons	----
K	Pass without Hons	Pass
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.	