THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of
Electronic and Information Engineering
電子及資訊工程學系

BSc (Hons) Degree Programme in Internet and Multimedia Technologies

Code: 42477; Full-time, Credit-based

Programme Booklet

(2018/19)

Department of Electronic and Information Engineering

Bachelor of Science (Honours) Degree Programme in

Internet and Multimedia Technologies

Full-time Credit-based

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Programme Booklet

2018/2019

BSc(Hons) in Internet and Multimedia Technologies (Full-Time)

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

1. GENERAL INFORMATION

1.1 Cohort of Intakes

This programme booklet is the definitive programme document for the 2018/19 cohort. Just in case any updated information is necessary after the publication of this booklet, students are requested to refer to the URL "http://www.eie.polyu.edu.hk/home/42477.html" for the most updated information. Should there be any discrepancy between the contents of this booklet and University regulations, University regulations always prevail.

1.2 Programme Information

Title of Programme	**Bachelor of Science (Honours) Degree in Internet and Multimedia Technologies**
Host Department	Department of Electronic and Information Engineering (EIE)
Programme Structure	Credit-based
Final Award	BSc(Hons) in Internet and Multimedia Technologies 互聯網及多媒體科技〔榮譽〕理學士
Mode of Attendance	Full-time
Duration	Normal Year 1 Intake Full-time Mode: 4 years nominal, 8 years maximum Senior Year Intake Full-time Mode: 2 years nominal, 4 years maximum
Total Credits for Graduation (Academic Credits + Training Credits + WIE Training Credit)	• Academic Credits: - Normal Year 1 Intake: 124 credits - Senior Year Intake: 67 credits • Training Credits: 5 (for all intakes) • Work-Integrated Education Training Credit: 1 (for all intakes)
Professional Recognition	The programme has been granted provisional accreditation from the Hong Kong Institution of Engineers (HKIE) as a Computer Science Programme. Provisional Accreditation Status enjoys all the rights and privileges that are equivalent to an accreditation status.

1.3 In addition to pursuing the BSc(Hons) in Internet and Multimedia Technologies as a Major, students studying in the Normal Year 1 Intake Full-time Mode may apply to study for an additional Minor. However, the additional Minor option is not available to students studying in the Senior Year Intake Full-time Mode.

2. RATIONALE, AIMS AND INTENDED LEARNING OUTCOMES OF THE PROGRAMME

2.1 Background and Rationale

Internet and multimedia technologies are among the key technologies that support the economic growth worldwide. Products with multimedia features are in great demand. With the increasing popularity of wired and wireless broadband communications, plenty of multimedia contents are being created, delivered and shared among users via the Internet. There is a need of professionals who exercise knowledge and leadership in all three areas of computer networks, multimedia and information technologies.

2.2 Aims

This Programme aims at producing graduates with:

1. a wide range of professional knowledge and skills relevant to Internet and Multimedia Technologies,
2. creativity and innovation,
3. adaptability to changing technology and society, and
4. all-rounded attributes.

2.3 Relationship of Programme Aims to University Missions

The University has the following missions:

1. To pursue impactful research that benefits the world.
2. To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.
3. To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

The following table illustrates the relationship between Programme Aims and University Missions:

Programme Aims	University Missions		
	1	2	3
1	X	X	X
2	X	X	
3	X	X	
4		X	X

2.4 Institutional Learning Outcomes

It is PolyU's educational mission to nurture competent professionals who are also critical thinkers, effective communicators, innovative problem solvers, lifelong learners, and ethical leaders. The institutional learning outcomes for these attributes are provided as follows:

1. **Competent professional:** Graduates should be able to integrate and apply in practice the fundamental knowledge and skills required for functioning effectively as entry-level professionals.
2. **Critical thinker:** Graduates should be able to examine and critique the validity of information, arguments, and different viewpoints, and reach a sound judgment on the basis of credible evidence and logical reasoning.
3. **Effective communicator:** Graduates should be able to comprehend and communicate effectively in English and Chinese, orally and in writing, in professional and daily contexts.
4. **Innovative problem solver:** Graduates should be able to identify and define problems in professional and daily contexts, and produce creative and workable solutions to the problems.
5. **Lifelong learner:** Graduates should recognise the need for continual learning and self-development, and be able to plan, manage and improve their own learning in pursuit of self-determined development goals.
6. **Ethical leader:** Graduates should have an understanding of leadership and be prepared to lead a team, and should acknowledge their responsibilities as professionals and citizens to society and their own nation, and be able to demonstrate ethical reasoning in professional and daily contexts.

2.5 Intended Learning Outcomes of the Programme

Programme Outcomes are the attributes of the graduates who have completed the Programme successfully. These attributes are classified into two broad categories. Category A embraces such attributes as knowledge, skills, abilities, attitudes that are related to Internet and multimedia technologies. Category B embraces all-roundedness attributes possessed by the graduates to support their further development.

Category A: Professional/Academic Knowledge and Skills

On successful completion of the Programme, students should be able to:

1. Apply knowledge of computing and mathematics appropriate to the discipline of Internet and Multimedia Technologies;
2. Apply knowledge of Internet and Multimedia Technologies to the abstraction and conceptualisation of Information and Communications Technology (ICT) models;
3. Analyse a problem in Internet and Multimedia Technologies, and identify and define the computing requirements appropriate to its solution;
4. Design, implement, and evaluate a system, process, component, or program in Internet and Multimedia Technologies to meet desired needs with appropriate consideration for public health and safety, social and environmental considerations; and
5. Use current techniques, skills, and tools necessary for practice in Internet and Multimedia Technologies with an understanding of the limitations.

Category B: Attributes for All-Roundedness

On successful completion of the Programme, students should be able to:

6. Function effectively on teams to accomplish a common goal;
7. Understand professional, ethical, legal, security and social issues and responsibilities;
8. Communicate effectively with a range of audiences;
9. Analyse the local and global impact of Internet and Multimedia Technologies on individuals, organisations, and society; and
10. Recognise the need for and engage in continuing professional development.

2.6 Relationship of Programme Outcomes to Programme Aims

The following table illustrates the relationship between Programme Outcomes and Programme Aims:

Programme Outcomes	Programme Aims			
	1	2	3	4
1	X		X	
2	X	X	X	
3	X	X	X	
4	X	X	X	
5	X		X	
6				X
7	X		X	X
8				X
9	X		X	X
10			X	X

2.7 Relationship of Intended Learning Outcomes of the Programme to Institutional Learning Outcomes

The following table illustrates the relationship between Intended Learning Outcomes of the Programme and Institutional Learning Outcomes:

Programme Outcomes	Institutional Learning Outcomes					
	1	2	3	4	5	6
1	X			X		
2	X	X		X		
3	X	X		X		
4	X			X		
5	X					
6			X			X
7	X					X
8	X	X	X	X		
9		X			X	
10					X	

3. ENTRANCE REQUIREMENTS

For non-local students who enter this programme by following a different education system from that in Hong Kong, they must possess the non-local qualifications for meeting the general entrance requirements for Bachelor Degree Programmes as published by the University.

For students who enter this programme by following the Hong Kong Diploma of Secondary Education (HKDSE) system or other local qualifications, they must satisfy both the University

general minimum entrance requirements AND the programme-specific requirements, as set out below.

3.1 University General Minimum Entrance Requirements

3.1.1 For those applying on the basis of HKDSE:

- 4 core subjects and 2 elective subject with
  - Level 3: English Language and Chinese Language
  - Level 2: Mathematics, Liberal Studies
  - Level 3: Two elective subjects [can include Extended Modules of Mathematics (M1/M2)]

3.1.2 For those applying on the basis of other local qualifications:

- An appropriate Diploma (as specified in section 3.2 below) passed with credit or a Higher Certificate (as specified in section 3.2 below) from a recognised institution; OR
- An appropriate Associate Degree/Higher Diploma from a recognised institution (suitable candidates will be considered for advanced standing entry to the senior year curriculum).

3.1.3 Other local/non-local qualifications deemed to be acceptable for admission purpose:

The University accepts attainments in HKALE / HKASLE, GCEALE / GCEASLE and IB for admission to its 4-year degree programmes. Applicants holding A-Level and IB qualifications will be granted credit transfer upon admission.

3.2 Programme-specific Minimum Entrance Requirements

In addition to the above general requirements, applicants must also satisfy the following programme-specific requirements:

3.2.1 For those applying on the basis of HKDSE:

- Level 3 in two elective subjects, preferably Physics, Biology, Chemistry, Combined Science, Information and Communication Technology or Extended modules of Mathematics.

3.2.2 For those applying on the basis of other local qualifications:

An Associate Degree, Higher Diploma, Higher Certificate or Diploma (with Credit) in Information Technology, Computer Science, Engineering, Electronic Engineering, Information Engineering, Communication Engineering, Electrical Engineering, Computer Engineering or other similar disciplines.

3.2.3 Holders of Associate Degree/Higher Diploma in related disciplines may be given credit transfer.

3.3 Admission of Advanced Standing Students Based on Advanced Academic Qualifications

(i) With approval by the Faculty, students may be admitted to the Programme beyond the initial stage provided they have demonstrably reached the general level of educational development which would have been reached had they taken the earlier stage(s) of the Programme, and provided that there is a high probability that they will complete the Programme successfully. These students will still be labelled as first year students even though they are following the curriculum of a later stage.

(ii) Students admitted on the basis of IB/A-Level qualifications will be given credit transfer, up to a maximum of 25% of the credit requirement for a 4-year degree programme in which 6 credits are for the Cluster Area Requirement (CAR), 3 credits for Freshmen Seminar and 3 credits for University English. For IB/GCE candidates who are able to attain the specified grade and total score requirements, a maximum of 6 credits could be further given from the English and Chinese LCR subjects. Any further credit transfer on the remaining CAR or discipline-specific subjects will be decided by the programme host department.

(iii) The number of credits that a student is required to complete for the award concerned will be determined at the time of admission, and no later than the end of the subject add/drop period.

(iv) Information on the number of credits required for normal entry and for the individual students based on their admission qualifications will both be reflected on the transcripts of study.

(v) If students who are admitted to the programme with entry credit transfer wish to gain higher grades by studying the subject(s) again, they may approach their programme offering Department for declining the provision of taking fewer credits no later than the end of the add/drop period.

(vi) Students who, upon admission, wish to transfer any credits from their previous studies, and take fewer credits than those confirmed at the time of admission, will have to follow the procedures for "application for credit transfer" and to pay the related fees. The credits to be transferred are subject to the rule on validity period for subject credits.

4. PROGRAMME, SUBJECTS, AND CREDITS

4.1 Programme Specified Subjects

This Programme is a credit-based, 4-year full-time programme. The minimum number of credits required for graduation is 124, plus 5 practical training credits and 1 WIE training credit.

Table 4.1 lists the subjects, their credit values, and the category they belong to (Compulsory or Elective). All discipline-specific subjects shown as compulsory are non-deferrable and must be taken in accordance with the progression pattern. The subjects offered will be updated from time to time according to the need of society and the profession.

All subjects in the first 2.5 years of studies (for students admitted to the programme through the normal Year 1 entry route) in the Programme are compulsory and they aim to provide a solid foundation to students. During the first year of studies, moreover, students are required to complete a 5-week practical training at Industrial Centre. The practical training consists of two parts: Computer Training and Electronic Practice. It will be conducted during the summer.

During the final 1.5 years of studies, students will be allowed to select 4 technical electives from a pool of subjects according to their own interest. They must complete a Computer Game Development Project or an Honours Project in their final year. In addition, students will take “non-technical” compulsory subjects on economics and management, and Cluster-Area Requirement (CAR) subjects (3 of the 12 CAR credits must be designated as China-related). The objectives of taking such “non-technical” subjects are to broaden the knowledge base of students and to enhance the all-roundedness of students. Before graduation, students must obtain a minimum of 1

training credit on Work-Integrated Education (WIE), which can be in the form of industrial project or jobs as deemed appropriate.

Table 4.1 Compulsory and Elective Subjects to be Taken by BSc in IMT Students

Subject	Subject Title	Credit	Category	
			Normal Year 1 Intake	Senior Year Intake
General University Requirements (GUR)				
-	Cluster-Area Requirement I (CAR I)	3	COM	COM
-	Cluster-Area Requirement II (CAR II)	3	COM	COM
-	Cluster-Area Requirement III (CAR III)	3	COM	-
-	Cluster-Area Requirement IV (CAR IV)	3	COM	-
-	Language and Communication Requirement I (LCR I) – English *	3	COM	-
-	Language and Communication Requirement II (LCR II) – English *	3	COM	-
-	Language and Communication Requirement III (LCR III) – Chinese*	3	COM	-
-	Leadership and Intra-Personal Development	3	COM	-
-	Service-Learning	3	COM	COM
ENG1003	Freshman Seminar for Engineering	3	COM	-
-	Healthy Lifestyle	0	COM	-
Discipline-Specific Requirement (DSR)				
AF3625	Engineering Economics	3	COM	COM
AMA1110	Basic Mathematics I – Calculus and Probability & Statistics	3	COM	-
AMA1120	Basic Mathematics II –Calculus and Linear algebra	3	COM	-
CBS3241P	Professional Communication in Chinese	2	COM	COM
COMP3512	Legal Aspects, Professionalism and Ethics of Computing	3	COM	COM
COMP4342	Mobile Computing	3	ELE	ELE
COMP4422	Computer Graphics	3	ELE	ELE
EIE1002	Electronics Science	3	COM	-
EIE2105	Digital and Computer Systems	3	COM	-
EIE2106	Signal and System Analysis	3	COM	-
EIE3101	Computer Animation	3	COM	COM
EIE3103	Digital Signals and Systems	3	COM	-
EIE3109	Mobile Systems and Application Development	3	COM	COM
EIE3112	Database System	3	COM	-
EIE3320	Object-Oriented Design and Programming	3	COM	COM
EIE3333	Data and Computer Communications	3	COM	COM
EIE3343	Computer Systems Principles	3	COM	-
EIE3360	Integrated Project	3	COM	COM
EIE4100	Computer Vision and Pattern Recognition	3	ELE	ELE
EIE4102	IP Networks	3	COM	COM

Subject	Subject Title	Credit	Category	
			Normal Year 1 Intake	**Senior Year Intake**
EIE4103	Mobile Computer System Architecture	3	ELE	ELE
EIE4104	Mobile Networking	3	ELE	ELE
EIE4105	Multimodal Human Computer Interaction Technology	3	ELE	ELE
EIE4106	Network Management and Security	3	ELE	ELE
EIE4108	Distributed Systems and Cloud Computing	3	ELE	ELE
EIE4428	Multimedia Communications	3	ELE	ELE
EIE4430	Honours Project	6	COM (Select any 1 subject out of these 2 subjects)	COM (Select any 1 subject out of these 2 subjects)
SD4981	Computer Game Development Project	6		
EIE4431	Digital Video Production and Broadcasting	3	COM	COM
EIE4432	Web Systems and Technologies	3	COM	COM
EIE4435	Image and Audio Processing	3	COM	COM
ELC3521	Professional Communication in English	2	COM	COM
ENG2002	Computer Programming	3	COM	-
ENG2003	Information Technology	3	COM	-
ENG3003	Engineering Management	3	COM	COM
IC2140	Practical Training	5	TRN	TRN
SD2983	Design Communication and Principles	3	COM	-
SD2984	3D Graphics and Animation Fundamentals	3	COM	-
SD3985	Computer Game Development	3	COM	COM

Note:

AF	School of Accounting and Finance
AMA	Department of Applied Mathematics
CBS	Department of Chinese and Bilingual Studies
COM	Compulsory
COMP	Department of Computing
EIE	Department of Electronic and Information Engineering
ELC	English Language Centre
ELE	Elective
ENG	Faculty of Engineering
IC	Industrial Centre
SD	School of Design
TRN	Training

* Details of the Language and Communication Requirement (LCR) are set out in Section 4.2.

Subject to the approval by the Programme Leader, students may take at most one Level 5 subject per semester to replace a final-year technical elective during their final year of study. The total number of Level 5 subjects taken shall not exceed 2. The following is the list of Level 5 subjects currently available.

Subject Code	Subject Title	Credit	Category
EIE522	Pattern Recognition: Theory and Applications	3	ELE
EIE529	Digital Image Processing	3	ELE
EIE546	Video Technology	3	ELE
EIE553	Security in Data Communication	3	ELE
EIE557	Computational Intelligence and its Applications	3	ELE
EIE558	Speech Processing and Recognition	3	ELE
EIE563	Digital Audio Processing	3	ELE
EIE566	Wireless Communications	3	ELE
EIE568	IoT - Tools and Applications	3	ELE
EIE569	Sensor Networks	3	ELE
EIE575	Vehicular Communications and Inter-Networking Technologies	3	ELE
EIE579	Advanced Telecommunication Systems	3	ELE
EIE581	Optical Wavelength Division Multiplexing Networks	3	ELE
EIE585	OFDM & MIMO Wireless Communications	3	ELE
EIE587	Channel Coding	3	ELE
EIE589	Wireless Data Network	3	ELE

4.2 Language and Communication Requirements (LCR)

Students are required to fulfil the four major components of the overall English and Chinese language requirements below in order to be eligible for graduation:

(i) Language and Communication Requirements (LCR) in English (6 credits) and Chinese (3 credits), as stated in Sections 4.2.1 and 4.2.2 below;
(ii) Writing Requirement, as stated in Section 4.2.3 below;
(iii) Reading Requirement, as stated in Section 4.2.4 below; and
(iv) Discipline-Specific Language Requirement, as stated in Section 4.2.5 below.

Senior year students would be considered for credit transfer for 4.2 (i) based on their previous studies in AD/HD programmes and their academic performance. Students not meeting the equivalent standard of the Undergraduate Degree LCR will be required to take degree LCR subjects on top of the normal curriculum requirement. The Department will refer to the guidelines provided by the Language Centres (ELC and CBS) to determine whether a new student has met the equivalent standard.

4.2.1 English

All undergraduate students must successfully complete <u>two</u> 3-credit English language subjects as stipulated by the University (Table A), according to their English language proficiency level. 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).

Students entering the University with specified attainment grades in certain public examinations can be given credit transfer or exemption for one or both LCR English subjects.

Table A: English LCR subjects (each 3 credits)

English language competence level/ Subject	***Practical English for University Studies***	***English for University Studies***	**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 B: Proficient level elective subjects for DSE Level 4 students and above (or equivalent) (each 3 credits)

LCR Proficient level elective subjects	Advanced English for University Studies
	Advanced English Reading and Writing Skills
	English in Literature and Film
	Persuasive Communication

(The above framework will also apply to students on Senior Year curriculum.)

4.2.2 Chinese

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

Table C: Chinese LCR subjects

Categories of students	**Required subject**
For Chinese speaking students	A Chinese LCR subject
For non-Chinese speakers or students whose Chinese standards are at junior secondary level or below	One subject from **Table D** 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)	• For non-Chinese speaking students; and • Students who have completed Chinese I or equivalent
Chinese III (for non-Chinese speaking students)	• 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)	• 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

Students who have obtained verified qualifications or certain results in some public examinations [e.g. HKDSE, HKALE, JEE, GSAT(Taiwan)] will be granted exemption for the Chinese LCR subject. (Conditions for the exemption will be worked out in due course.)

(The above framework and exemption arrangements will also apply to students on Senior Year curriculum.)

4.2.3 Writing Requirement in CAR Subjects

In additional to the LCR in English and Chinese explained above, all students must also, among the Cluster Areas Requirement (CAR) subjects they take, pass one subject that requires a substantial piece of writing in English and one subject that requires a substantial piece of writing in Chinese. Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be exempted from the Chinese Writing requirement.

4.2.4 Reading Requirement in CAR Subjects

All students must, among the CAR subjects they take, must pass one subject that requires the reading of an extensive text in English and one subject that requires the reading of an extensive text in Chinese. Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be exempted from the Chinese Reading requirement.

A list of approved CAR subjects for meeting the Writing Requirement (with a "W" designation) and for meeting the Reading Requirement (with an "R" designation) is shown at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

4.2.5 Discipline-Specific Language Requirement

In addition to the LCR mentioned in Sections 4.2.1 to 4.2.4 above, students also have to complete the subject “Professional Communication” (2 credits in English and 2 credits in Chinese) as the discipline-specific language requirements.

Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be exempted from the Discipline-Specific Chinese Language requirement, i.e. CBS3241P Professional Communication in Chinese. These students must take 1 subject of any level to make up for the minimum total credit requirement.

4.3 Specified Progression Pattern

4.3.1 Normal Year 1 Intake:

Year 1	
Semester 1 (12 credits)	**Semester 2 (18 credits)**
AMA1110 Basic Mathematics I – Calculus and Probability & Statistics (3 credits)	AMA1120 Basic Mathematics II –Calculus and Linear algebra (3 credits)
ENG2003 Information Technology (3 credits)	CAR I (3 credits) Note 1
LCR I – English (3 credits)	CAR II (3 credits) Note 1
ENG1003 Freshman Seminar for Engineering (3 credits)	LCR II – English (3 credits)
	EIE1002 Electronics Science (3 credits)
	Leadership and Intra-Personal Development (3 credits)
Healthy Lifestyle (0 credit) Note 1	
Semester 3 – IC2140 Practical Training (5 training credits)	
Year 2	
Semester 1 (15 credits)	**Semester 2 (14 credits)**
LCR III – Chinese (3 credits)	ELC3521 Professional Communication in English (2 credits)
EIE2106 Signal and System Analysis (3 credits)	EIE3103 Digital Signals and Systems (3 credits)
EIE2105 Digital and Computer Systems (3 credits)	EIE3343 Computer Systems Principles (3 credits)
SD2983 Design Communication and Principles (3 credits)	SD2984 3D Graphics and Animation Fundamentals (3 credits)
ENG2002 Computer Programming (3 credits)	EIE3112 Database System (3 credits)
Year 3	
Semester 1 (15 credits)	**Semester 2 (18 credits)**
EIE3109 Mobile Systems and Application Development (3 credits)	EIE4102 IP Networks (3 credits)
EIE3320 Object-Oriented Design and Programming (3 credits)	EIE4431 Digital Video Production and Broadcasting/ Technical Elective 1 (3 credits) Note 2
EIE3333 Data and Computer Communications (3 credits)	SD3985 Computer Game Development (3 credits)
EIE4435 Image and Audio Processing (3 credits)	EIE3360 Integrated Project (3 credits)
EIE4432 Web Systems and Technologies (3 credits)	Service-Learning (3 credits) Note 1
	EIE3101 Computer Animation (3 credits)
Year 4	
Semester 1 (15 credits)	**Semester 2 (17 credits)**
SD4981 Computer Game Development Project / EIE4430 Honours Project (6 credits)	
ENG3003 Engineering Management (3 credits)	AF3625 Engineering Economics (3 credits)
Technical Elective 1 or 2 (3 credits)	CBS3241P Professional Communication in Chinese (2 credits)
Technical Elective 2 or 3 (3 credits)	COMP3512 Legal Aspects, Professionalism and Ethics of Computing (3 credits)
CAR III (3 credits) Note 1	EIE4431 Digital Video Production and Broadcasting/Technical Elective 3 (3 credits) Note 2
	CAR IV (3 credits) Note 1

Total Number of Credits: 124

Note 1. The study pattern for the subjects is indicative only. Students may take these subjects according to their own schedule. They are recommended to consult their Academic Advisor for guidance and planning if necessary.

Note 2. Students can either take:
- "EIE4431 Digital Video Production and Broadcasting" in Year 3 Semester 2, Technical Elective 1 and 2 in Year 4 Semester 1 and Technical Elective 3 in Year 4 Semester 2, OR
- Technical Elective 1 in Year 3 Semester 2, Technical Elective 2 and 3 in Year 4 Semester 1 and "EIE4431 Digital Video Production and Broadcasting" in Year 4 Semester 2.

4.3.2 Senior Year Intake:

- For Senior Year students with relevant Higher Diploma/Associate Degree from a recognized institution [Note 3]

Year 1	
Semester 1 (15 credits)	**Semester 2 (18 credits)**
EIE3109 Mobile Systems and Application Development (3 credits)	EIE4102 IP Networks (3 credits)
EIE3320 Object-Oriented Design and Programming (3 credits)	EIE4431 Digital Video Production and Broadcasting/ Technical Elective 1 (3 credits) [Note 2]
EIE3333 Data and Computer Communications (3 credits)	SD3985 Computer Game Development (3 credits)
EIE4435 Image and Audio Processing (3 credits)	EIE3360 Integrated Project (3 credits)
EIE4432 Web Systems and Technologies (3 credits)	Service-Learning (3 credits) [Note 1]
	EIE3101 Computer Animation (3 credits)
Semester 3: IC2140 Practical Training (5 training credits)	
Year 2	
Semester 1 (18 credits)	**Semester 2 (16 credits)**
SD4981 Computer Game Development Project / EIE4430 Honours Project (6 credits)	
ENG3003 Engineering Management (3 credits)	AF3625 Engineering Economics (3 credits)
Technical Elective 1 or 2 (3 credits)	CBS3241P Professional Communication in Chinese (2 credits)
Technical Elective 2 or 3 (3 credits)	ELC3521 Professional Communication in English (2 credits)
CAR I (3 credits) [Note 1, 4]	COMP3512 Legal Aspects, Professionalism and Ethics of Computing (3 credits)
CAR II (3 credits) [Note 1,4]	EIE4431 Digital Video Production and Broadcasting/Technical Elective 3 (3 credits) [Note 2]

Total Number of Credits: 67 [Note 5]

Note 1. The study pattern for the subjects is indicative only. Students may take these subjects according to their own schedule. They are recommended to consult their Academic Advisor for guidance and planning if necessary.

Note 2. Students can either take:
- "EIE4431 Digital Video Production and Broadcasting" in Year 1 Semester 2, Technical Elective 1 and 2 in Year 2 Semester 1 and Technical Elective 3 in Year 2 Semester 2, OR
- Technical Elective 1 in Year 1 Semester 2, Technical Elective 2 and 3 in Year 2 Semester 1 and "EIE4431 Digital Video Production and Broadcasting" in Year 2 Semester 2.

Note 3. This is an example only, which shows a possible study pattern for graduates with relevant Higher Diploma/Associate Degree from a recognized institution. The exact study pattern for senior year intakes varies from student to student depending on the approved subjects transferred.

Note 4. 6 credits of Cluster Areas Requirement (CAR) from two different cluster areas. Students also need to fulfil the English and Chinese reading and writing requirements and take 3 of the 6 CAR credits designated as "China-related" (China Studies Requirement), if such requirements have not been fulfilled in previous studies.

Note 5: The credits required and progression pattern presented above are for students who have been given credit transfer of the 9 credits Undergraduate Degree LCR subjects based upon their previous studies. Students not meeting the equivalent standard of the Undergraduate Degree LCR will be required to take the required subjects. Details on the Undergraduate Degree LCR subjects are given in section 4.2 of this booklet.

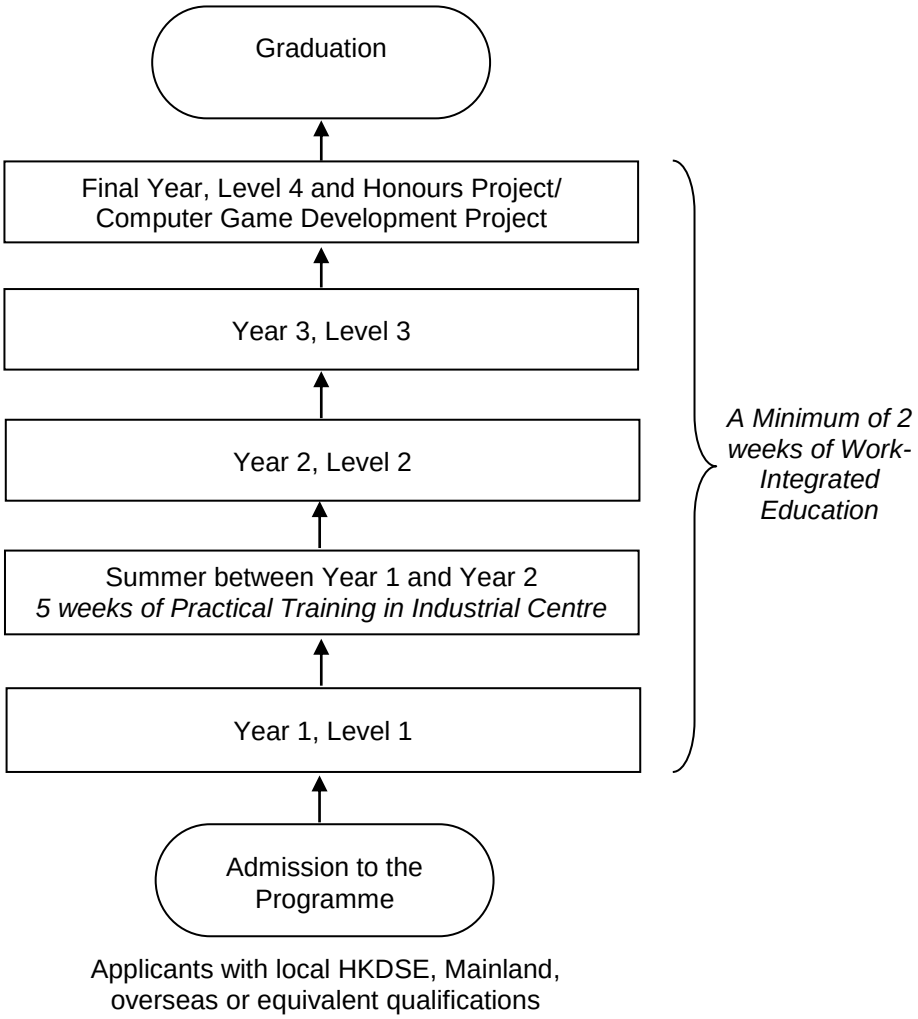
5. MODE OF STUDY AND FRAMEWORK

5.1 Mode of Study

A mode of study is characterized by the credits and subjects required and the progression pattern in Year 1 to Year 4 (or in Year 1 to Year 2 for Senior Year Intake).

(i) Normal Year 1 Intake Full-time Mode

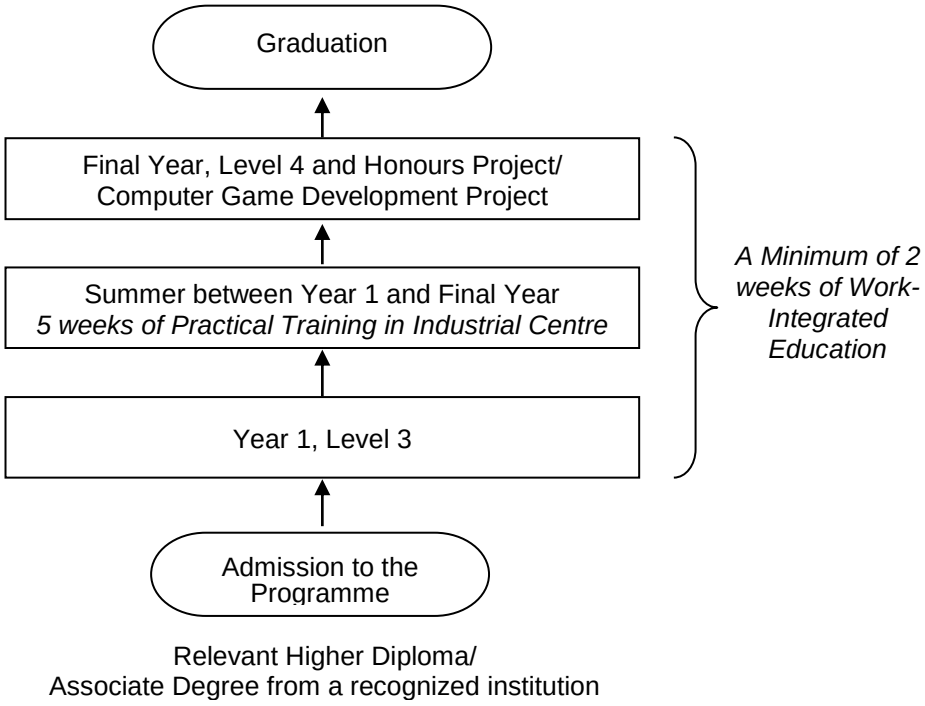
Under this mode, students will normally pursue four years of study in full time and then graduate at the end of the fourth year after having satisfied all programme requirements.



Applicants with local HKDSE, Mainland, overseas or equivalent qualifications

(ii) Senior Year Intake Full-time Mode

Under this mode, senior year students will normally pursue their study by going through Year 1 and Year 2 in full time and then graduate at the end of Year 2 after having satisfied all programme requirements.



6. CURRICULUM MAP

Alignment of Subjects with Programme Intended Learning Outcomes:

	Programme Outcomes									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A. GENERAL UNIVERSITY REQUIREMENTS (GUR)										
Language and Communication Requirements (LCR)										
LCR - English - ELCXXXX (2 Subjects)								T,P		
LCR - Chinese - CBSXXXX (1 Subject)								T,P		
Cluster-Area Requirements (CAR) (4 Subjects)										
CAR - Cluster-Area Requirement Subjects+							T,P	T,P	T,P	T,P
Other Requirements										
ENG1003 Freshman Seminar for Engineering						T,P		T,P	T	T,P
LIPD - Leadership and Intra-Personal Development							T,P			
SL - Service-Learning						T,P		T,P		
B. DISCIPLINE-SPECIFIC REQUIREMENTS (DSR)										
Compulsory - Mathematics and Sciences Subjects										
AMA1110 Basic Mathematics I – Calculus and Probability & Statistics			T,P		T,P					T
AMA1120 Basic Mathematics II – Calculus and Linear Algebra			T,P		T,P					T
EIE1002 Electronics Science	T			T				P		
Compulsory - Computer Science and Engineering Subjects										
EIE2105 Digital and Computer Systems	T	P	T							
EIE2106 Signal and System Analysis				T	P			T		T
EIE3101 Computer Animation				T	T					
EIE3103 Digital Signals and Systems			T		P			T		T
EIE3109 Mobile Systems and Application Development				T	T				T,P	
EIE3112 Database System		T			T,P			T,P		
EIE3320 Object-Oriented Design and Programming	T,M		T,P	T,P, M	P					
EIE3333 Data and Computer Communications	T	T			T,P			T		
EIE3343 Computer Systems Principles		P	T							T
EIE3360 Integrated Project	T,P, M	T,P, M	T,P, M		T,P, M	P,M		P,M		T,P, M
EIE4102 IP Networks	T				T,P					T
EIE4431 Digital Video Production and Broadcasting	T,P, M		T		T,P, M					T
EIE4432 Web Systems and Technologies		T			T,P	P,M				T
EIE4435 Image and Audio Processing			T,M	T,M		T				
ENG2002 Computer Programming	T,P		T,P		T,P					T
ENG2003 Information Technology			T,P		T,P				T,P	
SD2984 3D Graphics and Animation Fundamentals					T,P	T,P		T,P		
SD3985 Computer Game Development			T,P	T,P		T,P		T,P		
Compulsory - Capstone Project (Select Any 1)										
EIE4430 Honours Project	P,M	P,M	P,M	P,M	P,M			P,M	P,M	P,M
SD4981 Computer Game Development Project			T,P	T,P		T,P		T,P		
Compulsory - Industrial Centre Training and Training through Work Experience										
IC2140 Practical Training			T,P		T,P	T,P	T		T	

	Programme Outcomes									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Work-Integrated Education (WIE)				P,M		P,M	P,M	P,M	P,M	P,M
Compulsory - Complementary Subjects										
AF3625 Engineering Economics						T,P	T,M	T,P		T,P
CBS3241P Professional Communication in Chinese								T,P, M		
COMP3512 Legal Aspects, Professionalism and Ethics of Computing							T,P, M	P,M		T,P, M
ELC3521 Professional Communication in English								T,P, M		
ENG3003 Engineering Management						T	T,M	T	T,M	
SD2983 Design Communication and Principles	T,P	T,P				T,P		T,P	T,P	
Elective - Computer Science and Engineering Subjects (Select Any 3)										
COMP4342 Mobile Computing		T,P	T,P	T,P	T,P	T,P		T,P	T,P	
COMP4422 Computer Graphics		T,P	T,P	T,P	T,P			T,P		T,P
EIE4100 Computer Vision and Pattern Recognition	T	T,P	T	T	T	T				T
EIE4103 Mobile Computer System Architecture			T		T					
EIE4104 Mobile Networking	T				T,P					T
EIE4105 Multimodal Human Computer Interaction Technology	T,P				T,P				T,P	
EIE4106 Network Management and Security	T,M	T,P, M	T,M	T	T,M			T		T
EIE4108 Distributed Systems and Cloud Computing	T,P		T	T,P	P			T,P	T,P	
EIE4428 Multimedia Communications	T	T	T,P, M							T

Note:

Programme Outcomes:

1. Apply knowledge of computing and mathematics appropriate to the discipline of Internet and Multimedia Technologies;
2. Apply knowledge of Internet and Multimedia Technologies to the abstraction and conceptualisation of Information and Communications Technology (ICT) models;
3. Analyse a problem in Internet and Multimedia Technologies, and identify and define the computing requirements appropriate to its solution;
4. Design, implement, and evaluate a system, process, component, or program in Internet and Multimedia Technologies to meet desired needs with appropriate consideration for public health and safety, social and environmental considerations; and
5. Use current techniques, skills, and tools necessary for practice in Internet and Multimedia Technologies with an understanding of the limitations.
6. Function effectively on teams to accomplish a common goal;
7. Understand professional, ethical, legal, security and social issues and responsibilities;
8. Communicate effectively with a range of audiences;
9. Analyse the local and global impact of Internet and Multimedia Technologies on individuals, organisations, and society; and
10. Recognise the need for and engage in continuing professional development.

T: Teach
P: Practice
M: Measured
+: Support of outcomes depends on particular project/subject design and requirements

7. HONOURS PROJECT / COMPUTER GAME DEVELOPMENT PROJECT

The Honours Project/ Computer Game Development Project is considered to be of great importance. This is reflected in the number of credits it carries, being 6 credits which are equivalent to two standard-sized subjects. Furthermore, the result of the Honours Project/ Computer Game Development Project will be very important when the Board of Examiners considers the award classification of a student. Normally, the Board of Examiners will expect a very good grade for the Honours Project/ Computer Game Development Project when a student is to be awarded a high Honours classification.

One of the important features of the project is “learning by doing”. It is intended to be a platform for students to develop their intellectual and innovative abilities, and to give them the opportunities to integrate and apply the knowledge and analytical skills gained in previous stages of study. It should also provide students with opportunities to develop their problem-solving skills and communication skills. The process from concept to final implementation and testing, through problem identification and the selection of appropriate solutions will be practised by the students.

7.1 Project Management

7.1.1 Honours Project

Normally each student will be assigned one project under the supervision of an academic staff member so that he/she will work independently to achieve the project objectives. In other cases, several students may work on different aspects of a large-scale project.

The assignment of projects is expected to be completed by the month of June preceding the beginning of the final year of study. Guidelines for Honours Project are given to students at the beginning of the final year.

7.1.2 Computer Game Development Project

The Computer Game Development Project consists of lectures that introduce basic technical components in 3D game programming, including architecture of 3D game engine, and algorithms and trends in their future developments. Students are required to study a new algorithm and study its implications in 3D game design and development.

Students are also required to complete a number of tasks corresponding to those essential technical components in laboratory sessions, which serve as the basis for students to realize the project.

Students have to form a group to work on a project to design, implement and evaluate a playable game to demonstrate their understanding in the entire game production process.

7.2 Project Assessment

7.2.1 Honours Project

Assessment of the Honours Project focuses in three main areas: project reports, oral presentations and work done over the whole project period. Assessment will be done by the project supervisor and an assessor. The Project Management Team, which is composed of the Programme Leader and staff members from teaching sections, will oversee the overall standard of assessment of the projects. The Project Management Team will also oversee the daily operation, such as fixing the dates of project report submission, oral presentation, demonstration, etc.

7.2.2 Computer Game Development Project

Written assignment is given to students so that students can study new algorithms in 3D computer game and understand their implications in 3D game design and development.

Laboratories are organized to let students learn and practise basic technical components in a 3D game engine for realizing a 3D game. Each student is required to complete a predefined task according to a lab sheet for each laboratory session.

Students form groups of at most three members to work on a project. Each group creates an original playable game from its own idea, and evaluate the game with intended players. During the project period, each group is required to submit assignments corresponding to different stages of the game development process. At the end of the project, each group is required to demonstrate their game and present their work to the class.

8. PRACTICAL TRAINING

Students are required to undergo training at the University's Industrial Centre (IC). Students have to complete Practical Training (IC2140), which is a 5-training-credit subject. Practical Training is an important part of the Programme in which students are given hands-on training, including the use of scientific computation tool, and practice on manufacturing a multimedia electronic product through a project in the design and fabrication of a multimedia electronic product prototype. IC training is essential for students to blend knowledge into practice and promotes critical thinking, which prepares them for working in an authentic environment.

Students will be assessed and graded in the normal manner from A+ to F, which will be counted in the evaluation of the Grade Point Average (GPA). However, the grade will not be counted towards the credit requirement of the award or the evaluation of the Weighted GPA. The IC training will be graded at the end of the Summer Term of Year 1. If the assessment cannot be done in time for the grade to be reported in the particular year, the grade will be reported during Semester One of the following academic year.

9. WORK-INTEGRATED EDUCATION (WIE)

9.1 WIE is a mandatory component of the programme. There can be several routes or options for the students to pursue Work-Integrated Education (WIE). These options include the One-year Internship Scheme (OIS), industrial projects and other workplace training opportunities provided by the University or found by students themselves, etc.

9.2 Credits Requirement

In order to graduate from this programme, students must attain a minimum of one WIE training credit within the period of study. Following the Faculty of Engineering's guideline, students will be awarded one WIE training credit for acquiring two weeks' full-time training. WIE training credits will not be counted towards the Grade Point Average (GPA) or the Weighted GPA (WGPA). After assessing the training performance, a Pass or a Fail grade will be awarded to the student on his/her WIE component.

9.3 Intended Learning Outcomes of WIE

Since WIE can take different forms and be applied to different kinds of job, the learning outcomes to be achieved vary depending on the job nature and its duration

engaged by the student. However, based on the experience gained, WIE can bring a lot of advantages to students' learning both in the profession-specific areas and in their all-round development. The intended learning outcomes of WIE are elaborated in the following paragraph.

On successful completion of the WIE component, the students will be able to:

(i) Apply knowledge and skills learned from the Programme on the job in a broad context of networking and multimedia profession.
(ii) Recognize the operation and requirement of real-life business, leading to the development of entrepreneurship, global outlook, professional ethics, social and cultural understanding.
(iii) Recognize the expectation of employers, hence leading to better employability.
(iv) Develop their all-round attributes such as interpersonal skills and leadership.
(v) Develop their critical and creative thinking, and problem-solving skills while taking into account various real-life constraints, helping them to pursue life-long learning and continuing professional development.

9.4 WIE Options

WIE component under the Programme can be in many forms, including One-year Internship Scheme (OIS), industrial project and other job opportunities.

9.4.1 One-year Internship Scheme (OIS)

The OIS lasts for 1 year. Under the OIS, the students will pursue Year 1, Year 2 and Year 3 study in full time (or Year 1 for Senior Year Intake), and then engage in industrial training in Year 4 (or Year 2 for Senior Year Intake). After the industrial training year, the students will pursue their final-year study in full time again. Normally the students will graduate at the end of Year 5 (or Year 3 for Senior Year Intake) after having satisfied all programme requirements.

Students who would like to join the OIS are required to submit an application to the Department prior to the commencement of the industrial training. They can choose to take 0 to 8 credits of subject in a semester during the industrial training year. The amount of tuition fee to be paid during the industrial training year will depend on the number of credits taken by the students in a semester.

9.4.2 Industrial Project

Industrial projects are Honours Projects working with the industry. Students working on an industrial project will pursue the project in a company for a certain period. The students will work with a real-life project in the real working environment.

9.4.3 Other Job Opportunities

It is possible that students find jobs for themselves to work during the summer vacation. This kind of job opportunity will be judged by the Department whether it is helpful to the students in achieving the intended learning outcomes of WIE. The students and the Academic Advisor/WIE Coordinators will work collaboratively with regard to the job selection and the subsequent training contents. The Department will constantly monitor the progress. At the end of the training, an assessment will be made on the achievement of learning outcomes.

9.5 Guidelines for Operation and Supervision of WIE

The Department adopts a set of strategies to support students' learning in the workplace. The followings are the details of the operation at different stages.

9.5.1 Preparation

The Department will actively align with the industry to get WIE placement opportunities for students. It is important for students to be fully aware of the benefits brought by WIE. Students will be asked to attend employment seminars as early as possible. Through this type of arrangement, students in all years will be well prepared for job hunting and employment in advance. Students will also be able to realize the benefits for engaging in WIE and the importance of taking an active role in completing the training with the best effort.

9.5.2 Operation

There will be WIE Coordinators overseeing all matters related to WIE activities under the Programme. The WIE Coordinators are the academic staff members of the Department responsible for the organization and operation of WIE activities. To guide the students and monitor their progress in taking the WIE,

each student will be assigned an academic advisor from the Department. The student and his/her Academic Advisor will jointly plan the WIE details, such as job selection, training plan, logging of activities, reporting, and assessment.

In the case that the student finds job placement(s) on his/her own, the Academic Advisor will work with the student to design the learning outcomes if the placement is suitable to be recognized as a WIE activity. The Academic Advisor will make frequent contacts with the student and, if appropriate, the employer to monitor the progress of the student.

Each student will be guided by his/her Academic Advisor when conducting the WIE training. The student's work will be monitored continuously and an assessment will be given when the WIE placement is completed.

9.5.3 Assessment of the WIE Component(s)

The objective of assessment is to determine what the student has achieved through WIE. The actual type of work and duration will vary from case to case. Hence, an assessment framework is set out in the following as a general guideline.

(i) Continuous Assessment

The Academic Advisor may visit the student during the training period so that the Academic Advisor and the employer will be able to discuss the student's performance together. This will give better feedback on the student's performance before the training is completed.

(ii) Report

After the training is completed, the student is required to submit a report to the Academic Advisor. The details to be contained in the report should be commensurate with the training duration. It contains a brief reflective writing on the training received, the objectives that have been achieved, and the experience gained. The student may also conduct a self-evaluation on his/her own performance. The report must be endorsed by the student's employer before its submission.

(iii) Employer Evaluation

At the end of the training period, the employer will provide an evaluation of the student's performance, assessing the student's work and all-round development.

(iv) Overall Assessment

An overall assessment of the student's performance will be made by the Academic Advisor by considering all the assessment components as stated in Section 9.5.3(i)-(iii). A pass grade will be given to the student upon satisfactory completion of the WIE component; otherwise, a failure grade will be given.

10. DEPARTMENTAL UNDERGRADUATE PROGRAMME COMMITTEE

10.1 The composition of the Departmental Undergraduate Programme Committee (DUPC) is decided by the Head of Department. Normally, the DUPC consists of Programme Leaders of all degree and higher diploma programmes hosted by the Department, Head of Department, representative from the Departmental Learning and Teaching Committee, teaching staff representatives, representatives from major serving departments and student representatives. The Committee is responsible for programme review and development.

10.2 The DUPC will collect and consider, on a regular basis, the views of students and other key stakeholders on the relevance and currency of the syllabi, the standards of the examinations, the development of the programme, the adequacy of resources and the local and worldwide trends related to learning and teaching, for the continuous improvement of the programme.

11. STUDENT STATUS

11.1 Students' eligibility for the range of services provided by the University will be governed by the students' status, which is determined with reference to the mode of attendance of the programmes enrolled and/or the study load as described in Sections 11.2 to 11.5 below.

Full-time students:

11.2 Students enrolling on this programme with a study load of 9 credits or more in a semester are classified as *full-time* students. Students who wish to change their study load to less than 9 credits in a semester will have to seek prior approval from their Department.

11.3 Full-time local students enrolled on UGC-funded programmes are eligible to apply for financial assistance from the Government in the form of grant and loan. Government grant and loan may not be granted beyond the normal period of study for the programme.

Self-paced students:

11.4 Students who wish to study at their own pace instead of following the specified progression pattern will have to seek prior approval from their Department. These students are referred to as self-paced students.

Subject-based students:

11.5 Students who wish to take individual subjects, but do not wish to register as a candidate for an award, are classified as subject-based students.

12. SUBJECT REGISTRATION AND WITHDRAWAL

12.1 In addition to programme registration, students need to register for subjects at specified periods prior to the commencement of a semester. An add/drop period will also be scheduled for each semester. Students may apply for withdrawal of their registration on a subject after the add/drop period, if they have a genuine need to do so. The application should be made to the relevant programme offering Department and will require the approval of both the subject lecturer and the host Department Programme Leader concerned (or an alternate academic staff authorised by the programme offering Department). Applications submitted after the commencement of the examination period will not be considered. Once the application of subject withdrawal is approved, the tuition fee paid for the subject will be forfeited and the withdrawal status of the subject will be shown in the examination result notification and transcript of studies, but will not be counted in the calculation of the GPA.

12.2 The pre-requisite requirements of a subject must have been fulfilled before a student registers for that subject. However, the subject offering Department has the discretion to waive the pre-requisite requirements of a subject, if deemed appropriate. If the pre-requisite subject concerned forms part of the requirements for award, the subject has to be passed in order to satisfy the graduation requirements for the programme concerned, despite the waiving of the pre-requisite.

12.3 Subject to the maximum study load of 21 credits per semester and the availability of study places, students are allowed to take additional subjects on top of the prescribed credit requirement for award before they become eligible for graduation. Students will be allowed to take additional subjects for the following semester for broadening purpose, after they fulfil the graduation requirements. However, they will still be subject to the maximum study load of 21 credits per semester and the availability of places in the subjects concerned. They will enrol as subject-based students only and be subject to the rules on "Admission of Subject-based Students", except that graduates from UGC-funded programmes will not be restricted to taking only subjects from a self-financed programme.

13. STUDY LOAD

13.1 For students following the progression pattern specified for their programme, they have to take the number of credits and subjects, as specified in this Programme Booklet, for each semester. Students cannot drop those subjects assigned by the department unless prior approval has been given by the department.

13.2 The normal study load is 15 credits in a semester. The maximum study load to be taken by a student in a semester is 21 credits, unless exceptional approval is given by the Head of the Department. For such cases, students are reminded that the study load approved should not be taken as grounds for academic appeal.

13.3 To help improve the academic performance of students on academic probation (the meaning of "academic probation" can be found in Section 21.2.), these students will be required to take a reduced study load in the following semester (Summer Term excluded). The maximum number of credits to be taken in a semester by students on academic probation is 12. If these students have strong reasons to study more credits, they will have to obtain the endorsement/approval of the respective authority:

(i) study 13 to 15 credits in a semester: endorsement by the Programme Leader and approval by the Departmental Learning and Teaching Committee (DLTC);

(ii) study 16 to 18 credits in a semester: endorsement by the Programme Leader, the DLTC and the Head of Department, and approval by the Faculty Dean;

(iii) study more than 18 credits in a semester: endorsement by the Programme Leader, the DLTC and the Head of Department, and approval by QAC(AD).

13.4 Students are not allowed to take zero subject in any semester, including the mandatory summer term as required by some programmes, unless they have obtained prior approval from the Department; otherwise they will be classified as having unofficially withdrawn from the programme. Students who have been approved for zero subject enrolment (i.e. taking zero subject in a semester) are allowed to retain their student status and continue using campus facilities and library facilities. Any semester in which the students are allowed to take zero subject will nevertheless be counted towards the maximum period of registration.

13.5 Students who have obtained approval to pace their studies and students on programmes without any specified progression pattern who wish to take more than the normal load of 15 credits in a semester should seek advice from the Department concerned before the selection of subjects.

14. SUBJECT EXEMPTION

Students may be exempted from taking any specified subjects, including mandatory General University Requirements (GUR) subjects, if they have successfully completed similar subjects previously in another programme or have demonstrated the level of proficiency/ability to the satisfaction of the subject offering department. Subject exemption is normally decided by the subject offering department. However, for applications submitted by students who have completed an approved student exchange programme, the subject exemption is to be decided by the programme offering department in consultation with the subject offering departments. In case of disagreement between the programme offering department and the subject offering department, the two Faculty Deans/School Board Chairmen concerned will make a final decision jointly on the application. If students are exempted from taking a specified subject, the credits associated with the exempted subject will not be counted towards the award requirements (except for exemptions granted at admission stage). It will therefore be necessary for the students to consult the programme offering department and take another subject in order to satisfy the credit requirement for the award.

15. CREDIT TRANSFER

15.1 Students may be given credits for recognised previous studies including mandatory General University Requirements (GUR) subjects; and the credits will be counted towards meeting the requirements for award. Transferred credits may be counted towards more than one award. The granting of credit transfer is a matter of academic judgment. In assessing the transferability of subjects previously taken, the syllabus of that subject should be carefully scrutinized to ascertain that it is comparable to the PolyU's curriculum. Whether the previous studies are from institutions on credit-based or non-credit-based system should not be a matter of concern, and the subject size need not be a perfect match. To ascertain the academic standing of the institution offering the previous studies, the Department might need to request the institutions concerned to provide more information.

15.2 Credit transfer may be done with or without the grade being carried over; the former should normally be used when the credits were gained from PolyU. Credit transfer with the grade being carried over may be granted for subjects taken from outside the University, if deemed appropriate, and with due consideration to the academic equivalence of the subjects concerned and the comparability of the grading systems adopted by the University and the other approved institutions. Subject credit transfer is normally decided by the subject offering Department. However, for applications submitted by students who have completed an approved student exchange programme, the decision will be made by the programme offering Department in consultation with the subject offering Departments. As the application for credit transfer may involve subjects offered by more than one Department, the programme offering Department should coordinate and check whether the maximum limit for credit transfer for a student has been exceeded, and whether the student has fulfilled the residential requirement of the University.

15.3 In case of disagreement between the programme offering Department and the subject offering Department, the two Faculty Deans/School Board Chairmen concerned will make a final decision jointly on the application. The validity period of credits previously earned is 8 years after the year of attainment.

15.4 Normally, not more than 50% of the credit requirement for award may be transferable from approved institutions outside the University. For transfer of credits from programmes offered by PolyU, normally not more than 67% of the credit requirement for award can be transferred. When both types of credits are being transferred (i.e. from programmes offered by PolyU and from approved institutions outside the University), not more than 50% of the credit requirement for award may be

transferred. For students exceptionally admitted to an Articulation Degree or Senior Year curriculum before 2017/18, which is already a reduced curriculum, they should not be given credit transfer for any required GUR subjects, and they must complete at least 60 credits to be eligible for award. Students admitted to an Articulation Degree or Senior Year curriculum based on qualification more advanced than Associate Degree/Higher Diploma before 2017/18 may be given credit transfer for the required GUR subjects if they had completed comparable components in their earlier studies. These students can take fewer than 60 credits for attaining the award. As from the 2017/18 intake cohort, all students admitted to an Articulation Degree or Senior Year curriculum, irrespective of the entry qualifications they held when applying for admission to the programmes, are required to complete at least 60 credits to be eligible for award.

15.5 If the transferred credits are for a PolyU programme accredited by a professional body, the Department concerned should ensure that the transferred credits will also meet the requirement of the relevant professional body.

15.6 If a student is waived from a particular stage of study on the basis of advanced qualifications held at the time of admission, the student concerned will be required to complete fewer credits for award. For these students, the 'deducted' credits at admission stage will be counted towards the maximum limit for credit transfer when students apply for further credit transfer after their admission. This also applies to students admitted to an Articulation Degree or Senior Year curriculum when they claim further credit transfer after admission.

15.7 Notwithstanding the upper limits stipulated in Section 15.4 above, (and unless professional bodies stipulate otherwise) students may be given more credit transfer than these upper limits (e.g. upon completion of an exchange programme as mentioned in Section 15.8 below), subject to their satisfying the residential requirement.

15.8 Credit transfer can be applicable to credits earned by students through studying at an overseas institution under an approved exchange programme. Students should, before they go abroad for the exchange programme, seek prior approval from the programme offering Department (who will consult the subject offering Departments as appropriate) on their study plan and credit transferability. As with all other credit transfer applications, the Departments concerned should scrutinise the syllabuses of the subjects which the students are going to take at the overseas institution, and determine their credit transferability based on academic equivalence with the corresponding subjects on offer at the PolyU, and the comparability of the grading

systems adopted by PolyU and the overseas institution. The transferability of credits, and the suitability for allowing grades to be carried over, must be determined and communicated to students before they go abroad for the exchange programme. In order to overcome the problems associated with subject-to-subject mappings, block credit transfer rather than subject-by-subject credit transfer can be given.

15.9 All credit transfers approved will take effect only in the semester for which they are approved. A student who applies for transfer of credits during the re-enrolment or the add/drop period of a particular semester will only be eligible for graduation at the end of that semester, even if the granting of credit transfer will immediately enable the student to satisfy the credit requirement for the award.

15.10 Regarding credit transfer for GUR subjects, the Programme Host Department is the approval authority at the time of admission to determine the number of GUR credits which an Advanced Standing student will be required to complete for the award concerned. Programme Host Departments will make reference to the mapping lists of GUR subjects, which are compiled by the Committee on General University Requirements (CoGUR), on the eligibility of the subjects that can be qualified as GUR subjects. Applications for credit transfer of GUR subjects after admission will be considered, on a case-by-case basis, by the Subject Offering Department or Office of General University Requirements (OGUR)/Office of Service Learning (OSL), in consultation with the relevant Sub-committee(s) under CoGUR, as appropriate.

15.11 For credit transfer of the same subject ever taken, the grade attained in the last attempt should be carried over with the credit transfer. Students applying for credit transfer for a subject taken in other institutions are required to declare that the subject grade used for claiming credit transfer was attained in the last attempt of the subject in their previous studies. If a student fails in the last attempt of that subject, no credit transfer should be granted, despite the fact that the student may have attained a pass grade for the subject in earlier attempts.

15.12 Students will not be granted credit transfer for a subject which they have attempted and failed in their current study unless the subject was taken by the student as an exchange-out student in his current programme.

16. DEFERMENT OF STUDY

16.1 Students may apply for deferment of study if they have a genuine need to do so such as illness or posting to work outside Hong Kong. Approval from the Department offering

the programme is required. The deferment period will not be counted towards the maximum period of registration.

16.2 Application for deferment of study will be entertained only in exceptional circumstances for students who have not yet completed the first year of a full-time or sandwich programme.

16.3 Where the period of deferment of study begins during a stage for which fees have been paid, no refund of such fees will be made.

16.4 Students who have been approved for deferment are not entitled to enjoy any campus facilities during the deferment period.

17. PRINCIPLES OF ASSESSMENT

17.1 Assessment of learning and assessment for learning are both important for assuring the quality of student learning. Assessment of learning is to evaluate whether students have achieved the intended learning outcomes of the subjects that they have taken and have attained the overall learning outcomes of the academic programme at the end of their study at a standard appropriate to the award. Appropriate methods of assessment that align with the intended learning outcomes will be designed for this purpose. The assessment methods will also enable teachers to differentiate students' different levels of performance within subjects. Assessment for learning is to engage students in productive learning activities through purposefully designed assessment tasks.

17.2 Assessment will also serve as feedback to students. The assessment criteria and standards will be made explicit to students before the start of the assessment to facilitate student learning, and feedback provided will link to the criteria and standards. Timely feedback will be provided to students so that they are aware of their progress and attainment for the purpose of improvement.

17.3 The ultimate authority in the University for the confirmation of academic decisions is the Senate, but for practical reasons, the Senate has delegated to the Faculty/School Boards the authority to confirm the decisions of Boards of Examiners provided these are made within the framework of the General Assessment Regulations. Recommendations from Board of Examiners which fall outside these Regulations shall be ratified by the Academic Regulations Committee (ARC) and reported to the Senate.

18. ASSESSMENT METHODS

18.1 Students' performance in a subject can be assessed by continuous assessment and/or examination, at the discretion of the individual subject offering Department. Where both continuous assessment and examination are used, the weighting of each in the overall subject grade will be clearly stated in the programme booklet. The subject offering Department can decide whether students are required to pass both the continuous assessment and examination components, or either component only, in order to obtain a subject pass, but this requirement (to pass both, or either components) will be specified in the programme booklet. Learning outcomes should be assessed by continuous assessment and/or examination appropriately, in line with the outcome-based approach.

18.2 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.

18.3 Assessment methods and parameters of subjects shall be determined by the subject offering department.

18.4 At the beginning of each semester, the subject teacher will inform students of the details of the methods of assessments to be used within the assessment framework as specified in the programme booklet.

19. SUBJECT RESULTS

19.1 Subject Lecturers, in respect of the subject they teach, have sole responsibilities for marking and grading students' coursework and examinations scripts. Timely feedback of continuous assessment will be given to students as soon as possible (e.g. not later than a month), and in any case, before the final examination/assessment. In this regard, Subject Lecturers will be accountable to the Head of the subject offering Department, to ensure that all forms of assessment, including the students' coursework and examination scripts, are correctly marked and graded where appropriate. Subject Lecturers will avoid administrative errors at all times, and submit the grades for finalisation by Subject Assessment Review Panel

(SARP) according to the schedule of the Department. To ensure consistency and uniformity for a common subject taught by different Subject Lecturers, meetings can be arranged amongst them before the examination papers are set or before the marking is done.

19.2 Subject grades will be reviewed and finalised by SARP before being formally released to students and submitted to the Board of Examiners. Each Department forms one or several SARPs to take care of the subjects it offers. The Board of Examiners will not attempt to change any grades.

19.3 SARP(s) shall be formed by the Head of the Department offering the subjects. It shall include the Head of the Department offering the subject as the Chairman, the relevant subject examiners and where appropriate, and the Programme Leader.

20. BOARD OF EXAMINERS (BoE)

20.1 The authority for approving the overall results of students rests with the Board of Examiners (BoE). The BoE will meet at the end of each semester (except for Summer Term unless there are students who are eligible to graduate after the completion of Summer Term subjects) and is responsible to the Senate for making:

(i) a decision on the classification of awards to be granted to each student on completion of the programme;

(ii) a decision on deregistration cases; and

(iii) a decision on cases with extenuating circumstance.

20.2 These decisions are made by the BoE at the end of each semester in the light of the standard of student achievement appropriate to the award to which the programme is designed to lead, the aims of the programme, the students' performance on the programme in previous years, the general assessment regulations of the University, the specific programme regulations, and good practice established in the University and elsewhere.

20.3 The BoE will not attempt to change the grades for any student in any subject nor condone failures. The decisions of the BoE, except those on award and deregistration cases which are straight forward, will be ratified by the Faculty Board. The Faculty Board may refer the decisions back to the BoE for further consideration and explanation.

20.4 Any decisions by the BoE outside the General Assessment Regulations of the University, supported by the Faculty Board, shall be referred to the Academic Regulations Committee for ratification. All such cases shall be reported to the Senate. Decisions by BoE outside the programme regulations but within the general assessment regulations of the University fall within the authority of the Faculty Board.

20.5 Students shall be formally notified of decisions affecting them after the BoE meeting except for those whose cases require ratification of the Faculty Board. For the latter cases, students shall be formally notified of decisions after the Faculty Board's ratification or, if a decision is outside the General Assessment Regulations, after the Academic Regulations Committee ratifies that decision. Any prior communication of results to these students shall be subject to formal ratification.

21. PROGRESSION / ACADEMIC PROBATION / DEREGISTRATION

21.1 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 deregistered from the programme.

21.2 When a student has a Grade Point Average (GPA) (see Section 25.3 below) lower than 2.0, he/she will be put on academic probation in the following semester. If a student is able to pull his/her GPA up to 2.0 or above at the end of that following 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.

21.3 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 exceeded the maximum period of registration for the programme as specified in this programme booklet; or
(ii) the student's GPA is lower than 2.0 for two consecutive semesters and his/her Semester GPA in the second semester is also lower than 2.0; or
(iii) the student's GPA is lower than 2.0 for three consecutive semesters.

When a student falls within the categories as stipulated above, the Board of Examiners shall de-register the student from the programme without exception.

21.4 The progression of students to the following academic year will not be affected by the GPA obtained in the Summer Term, unless Summer Term study is mandatory for all students of the programme and constitutes a requirement for graduation, and is so specified in this programme booklet.

21.5 A student may be de-registered from the programme enrolled before the time frame specified in Sections 21.3(ii) or 21.3(iii) 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 2.0 at the end of the programme is slim or impossible.

21.6 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 Academic Appeals Committee (AAC) for final decision. Views of Faculties/Schools/Departments will be sought and made available to AAC for reference.

22. APPEAL AGAINST ASSESSMENT RESULTS

A student may appeal against a decision on their assessment results or the decision on deregistration upon the public announcement of the overall results. The procedures for appeals against examination results are detailed in the Student Handbook.

23. RETAKING OF SUBJECTS

23.1 Students may retake any subject for improving their grade without having to seek approval, but they must retake a compulsory subject which they have failed, i.e. obtained an F grade. However, students who have passed a General University Requirements (GUR) subject are not allowed to re-take the same GUR subject for improving their grade. Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded. Students wishing to retake passed subjects will be accorded a lower priority than those who are required to retake (due to failure in a compulsory subject) and can only do so if places are available.

23.2 The number of retakes of a subject is not restricted. Only the grade obtained in the final attempt of retaking (even if the retake grade is lower than the original grade for an originally passed subject) will be included in the calculation of the Grade Point

Average (GPA). If students have passed a subject but failed after retake, credits accumulated for passing the subject in a previous attempt will remain valid for satisfying the credit requirement for award. (The grades obtained in previous attempts will only be reflected in transcript of studies.).

23.3 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, students who fail a Cluster Area Requirement (CAR) subject may 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 at a particular time. 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. However, if 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.

24. EXCEPTIONAL CIRCUMSTANCES

Absence from an assessment component

24.1.1 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). If the late assessment cannot be completed before the commencement of the following academic year, the Faculty/School Board Chairman shall decide on an appropriate time for completing the late assessment.

24.1.2 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.

Assessment to be completed

24.2 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 remedial work must not take the form of re-examination.

Aegrotat award

24.3 If a student is unable to complete the requirements of the programme in question 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/School Board will determine whether the student will be granted an aegrotat award. Aegrotat award will be granted under very exceptional circumstances.

24.4 A student who has been offered an aegrotat award shall have the right to opt to either 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.

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

24.6 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.

Other particular circumstances

24.7 A student's particular circumstances may influence the procedures for assessment but not the standard of performance expected in assessment.

25. GRADING

25.1 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject (including GUR subjects) shall be graded as follows:

Subject grade	***Short description***	***Elaboration on subject grading description***
A+	Exceptionally Outstanding	The student's work is exceptionally outstanding. It exceeds the intended subject learning outcomes in all regards.
A	Outstanding	The student's work is outstanding. It exceeds the intended subject learning outcomes in nearly all regards.
B+	Very Good	The student's work is very good. It exceeds the intended subject learning outcomes in most regards.
B	Good	The student's work is good. It exceeds the intended subject learning outcomes in some regards.
C+	Wholly Satisfactory	The student's work is wholly satisfactory. It fully meets the intended subject learning outcomes.
C	Satisfactory	The student's work is satisfactory. It largely meets the intended subject learning outcomes.
D+	Barely Satisfactory	The student's work is barely satisfactory. It marginally meets the intended subject learning outcomes.
D	Barely Adequate	The student's work is barely adequate. It meets the intended subject learning outcomes only in some regards.
F	Inadequate	The student's work is inadequate. It fails to meet many of the intended subject learning outcomes.

'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.

25.2 A numeral grade point is assigned to each subject grade, as follows:

Grade	***Grade Point***
A+	4.5
A	4
B+	3.5
B	3
C+	2.5
C	2
D+	1.5
D	1
F	0

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

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

where n = number of subjects (inclusive of failed subjects) taken by the student up to and including the latest semester. 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, but without any grade assigned (Subjects taken in PolyU or elsewhere and with grades assigned, and for which credit transfer has been approved, will be included in the GPA calculation.)

(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 assessment, 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 is capped at 4.0.

25.4 Different types of GPA's

25.4.1 GPA's will be calculated for each Semester including the Summer Term. This Semester GPA will be used to determine students' eligibility to progress to the next Semester alongside with the 'cumulative GPA'. However, the Semester GPA calculated for the Summer Term will not be used for this purpose, unless the Summer Term study is mandatory for all students of the programme concerned and constitutes part of the graduation requirements.

25.4.2 The GPA calculated after the second Semester of the students' study is therefore a 'cumulative' GPA of all the subjects taken so far by students, and without applying any level weighting.

25.4.3 Along with the 'cumulative' GPA, a weighted GPA will also be calculated, to give an indication to the Board of Examiners on the award classification a student will likely get if he/she makes steady progress on his/her academic studies. GUR subjects will be included in the calculation of weighted GPA for all programmes.

25.4.4 When a student has satisfied the requirements for award, an award GPA will be calculated to determine his/her award classification. GUR subjects will be included in the calculation of award GPA for all programmes.

25.4.5 For students taking the Major/Minor study route, a separate GPA will be calculated for their Major and Minor programmes. The Major GPA will be used to determine his/her award classification, which will be so reflected on the award parchment. The Minor GPA can be used as a reference for the Board of Examiners to moderate the award classification for the Major, as explained further in Section 27.13.

25.4.6 The relationship between the different types of GPA's, and the methods for calculating each, is further explained in Appendix 1.

26. GRADUATION REQUIREMENTS FOR BSC(HONS) IN INTERNET AND MULTIMEDIA TECHNOLOGIES PROGRAMME

All students qualifying for a 4-year Full-time Undergraduate Degree offered from 2018/19 onward must meet:

(i) the University Graduation Requirements, as explained in Section 26.1 below; and
(ii) the specific graduation requirements of their chosen programme of study (Majors and Minors), as stated in Sections 26.2 below.

26.1 University Graduation Requirements

26.1.1 Normal Year 1 Intake:

(i) Satisfy the following requirements in general education (GUR):
  (a) 9 credits of Language and Communication Requirements (LCR) as set out in Section 4.2 Note 1.
  (b) 3 credits of Freshman Seminar.
  (c) 3 credits of Leadership and Intra-Personal Development.
  (d) 3 credits of Service-Learning.
  (e) 12 credits of Cluster Areas Requirement (CAR).
  (f) 3 of the 12 CAR credits being designated as “China-related” (China Studies Requirement).
  (g) Healthy Lifestyle Note 2.
(ii) Earn a cumulative GPA of 2.00 or above at graduation.
(iii) Obtain at least 1 WIE credit as set out in Section 9.2.
(iv) Satisfy the residential requirement for at least 1/3 of the credits to be completed for the award the student is currently enrolled, unless the professional bodies stipulate otherwise.

26.1.2 Senior Year Intake:

(i) Satisfy the following requirements in general education (GUR):
  (a) 3 credits of Service-Learning.
  (b) 6 credits of Cluster Areas Requirement (CAR) from two different cluster areas.
  (c) 3 of the 6 CAR credits being designated as “China-related” (China Studies Requirement.)
  (d) Fulfilment of the English and Chinese reading and writing requirements in CAR subjects.

(e) Having met the equivalent standard of the Undergraduate Degree Language and Communication Requirements (LCR) as set out in Section 4.2 [Note 1].

(ii) Earn a cumulative GPA of 2.00 or above at graduation.

(iii) Obtain at least 1 WIE credit as set out in Section 9.2.

(iv) Satisfy the residential requirement for at least 1/3 of the credits to be completed for the award the student is currently enrolled, unless the professional bodies stipulate otherwise.

Further details about the University Graduation Requirements can be found in Appendix 2.

Note 1: 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.

Note 2: Students admitted to the programmes as Senior Year Intakes are not required to take the Healthy Lifestyle Programme. Advanced Standing students are required to take Healthy Lifestyle (except for those who are HD/AD holders who follow the Senior Year/Articulation Degree programme GUR curriculum).

26.2 Specific Graduation Requirements for the **BSc(Hons) in Internet and Multimedia Technologies** Programme

26.2.1 Normal Year 1 Intake:

(i) Complete successfully a minimum of **124** academic credits composed of the following:

(a) 30 credits of General University Requirements (GUR) as set out in Section 26.1.1(i).

(b) 94 credits of Discipline-Specific Requirements (DSR), of which 85 credits from subjects categorized as COM (compulsory) and 9 credits from subjects categorized as ELE (elective) as stated in Table 4.1.

(ii) Obtain a total 5 credits in TRN (Training) as stated in Table 4.1.

(iii) Satisfy the residential requirement for at least 1/3 of the credits to be completed for the award the student is currently enrolled, unless the professional bodies stipulate otherwise.

26.2.2 Senior Year Intake:

(i) Complete successfully a minimum of **67** academic credits composed of the following:
   (a) 9 credits of General University Requirements (GUR) as set out in Section 26.1.2 (i).
   (b) 58 credits of Discipline-Specific Requirements (DSR), of which 49 credits from subjects categorized as COM (compulsory) and 9 credits from subjects categorized as ELE (elective) as stated in Table 4.1.

(ii) Obtain a total 5 credits in TRN (Training) as stated in Table 4.1.

(iii) Satisfy the residential requirement for at least 1/3 of the credits to be completed for the award the student is currently enrolled, unless the professional bodies stipulate otherwise.

26.3 Remedial subjects are designed for new students who are in need of additional preparations in a particular subject area, and only identified students of a programme are required to take these subjects. These subjects should therefore be counted outside the regular credit requirement for award.

26.4 In addition, students may be required to take subjects that are designed to enhance their skills in particular subject areas to underpin their further advanced study in the discipline. These underpinning subjects could be of different subject areas (e.g. Mathematics, science subjects), and the number of credits each student is required to take in a particular underpinning subject area may vary according to the different academic backgrounds of the students. With effect from the 2015/16 intake cohort, the regular credit requirement for award will count the lowest number of credits taken by the students in the same subject area.

26.5 Senior Year intakes admitted to the 4-year Undergraduate Degree programmes on the strength of the Associate Degree/Higher Diploma qualifications are required to complete at least 60 credits in order to be eligible for a Bachelor's degree. Exemption may be given from subjects already taken in the previous Associate Degree/Higher Diploma studies. In that case, students should take other electives (including free electives) instead to make up the total number of credits required. For students who are exceptionally admitted before 2017/18 on the basis of academic qualification(s) more advanced than Associate Degree/Higher Diploma, such as the advanced stage of a 4-year degree curriculum programme, Departments can continue to grant credit transfer as appropriate, to give recognition to the advanced study taken. These students can take fewer than 60 credits for attaining the award. The proportion of these students should remain low. As from the 2017/18 intake cohort, all students

admitted to an Articulation Degree or Senior Year curriculum, irrespective of the entry qualifications they held when applying for admission to the programmes, are required to complete at least 60 credits to be eligible for award.

26.6 Level-0 subjects and training subjects (including clinical/field training) will not be counted to fulfill free elective requirement for graduation purpose.

26.7 Students Taking the Major/Minor Option

The credit requirement for a Minor is 18 with at least 50% (9 credits) of the subjects at Level 3 or above. Students taking the Major/Minor option will be considered for an award when they have satisfied the requirements for both the Major and Minor studies (i.e. having a GPA of 2.0 or above) and have submitted an application for graduation. If the 18 credits taken for the approved Minor study can meet the requirements for that Minor, the Major students may apply to graduate with a specific Minor, in addition to their Major. Otherwise, students will graduate with a Major only. Subject to approval by the Minor-offering department, students may count up to 6 credits from their Major/GUR (including LCR subjects at proficient level) towards their chosen Minor. Nevertheless, students must take at least 6 credits from their chosen Minor programme in order to satisfy the residential requirement of their chosen Minor. In addition, to be eligible for the Major and Minor awards, the total number of credits taken by the students for their Major/Minor studies must not be lower than the credit requirement of the single discipline Major programme.

26.8 A student is required to graduate as soon as he/she satisfies the graduation requirements as stipulated in Sections 26.1, 26.2, 26.6 and 26.7 above. The student concerned is required to apply for graduation, in the semester in which he/she is able to fulfil all his/her graduation requirements, and after the add/drop period for that semester has ended.

27. GUIDELINES FOR AWARD CLASSIFICATION

27.1 The guidelines for award classification are stated in the following. In using these guidelines, 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.

27.2 This programme uses Weighted GPA as a guide for helping to determine award classifications. A University-wide standard weighting is applied to all subjects of the

same level, with a weighting of 2 for Level 1 and 2 subjects, a weighting of 3 for Level 3, 4 and 5 subjects.

Weighted GPA will be computed as follows:

$$\text{Weighted GPA} = \frac{\sum_{n} \text{Subject Grade Point} \times \text{Subject Credit Value} \times W_i}{\sum_{n} \text{Subject Credit Value} \times W_i}$$

where W_i = weight assigned according to the level of the subject.

n = number of subjects counted towards the award as listed in Table 4.1 according to the Specified Progression Pattern (Section 4.3) (inclusive of failed subjects) taken by the student up to and including the latest semester. (For subjects that have been retaken, only the grade obtained in the final attempt will be included in the GPA calculation except those exclusions specified in Section 27.3.)

Same as GPA, Weighted GPA is capped at 4.0.

27.3 Any subjects passed after the graduation requirement has been met will not be taken into account in the grade point calculation for award classification.

27.4 The following are guidelines for the Board for Examiners' reference in determining award classifications:

Honours Degrees	***Guidelines***
1st	The student's performance/attainment is outstanding, and identifies him/her as exceptionally able in the field covered by the programme in question.
2nd (Division I)	The student has reached a standard of performance/attainment which is more than satisfactory but less than outstanding.
2nd (Division 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.

27.5 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 when the student has demonstrated a level of final attainment which is below the 'essential minimum' required for graduation with Honours from the programme in question, but has nonetheless covered the prescribed work of the programme in an adequate fashion while failing to show sufficient evidence of the expected intellectual calibre of Honours degree graduates. For example, if a student in an Honours degree programme has a Grade Point Average (GPA) of 2.0 or more, but his/her Weighted GPA is less than 2.0, he/she may be considered for a Pass-without-Honours classification. A Pass-without-Honours is an unclassified award, but the award parchment will not include this specification.

27.6 Students who have committed academic dishonesty will be subject to the penalty of lowering the 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. 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.

27.7 The following is a set of indicators, for the Boards of Examiners' reference, which can be used in helping to determine award classification:

Honours Classification	***Weighted GPA***
1st	3.7^{+} - 4
2nd (Division I)	3.2^{+} - 3.7^{-}
2nd (Division II)	2.3^{+} - 3.2^{-}
3rd	2.0 - 2.3^{-}

Note: "+" sign denotes 'equal to or more than'; "–" sign denotes 'less than'.

27.8 There is no requirement for the Board of Examiners to produce an award list which conforms to the guidelines in Section 27.7 above.

Students Taking the Major/Minor Studies:

27.9 For students who have completed a Major/Minor programme, a single classification will be awarded and their award classification will mainly be based on the "Major GPA", but it can be moderated by the Board of Examiners with reference to the "Minor GPA". For students who have completed a Major programme combined with free electives, their award classification will be determined by their "Major GPA" which includes grades obtained for the free electives, if appropriate.

27.10 "Major GPA" is derived based on all subjects of the Major programme, including those meeting the mandatory General University Requirements (GUR) and programme-specific language requirement, but not necessarily including the training credits.

27.11 "Minor GPA" is derived based on the 18 credits of the specific Minor programme. Minor GPA is unweighted.

27.12 The "Major GPA" and the "Minor GPA" will be presented separately to the Board of Examiners for consideration. The guidelines for determining award classification as stipulated in Sections 27.1 to 27.8 above are applicable to programmes with Major/Minor studies.

27.13 Where a student has a high GPA for his/her Major but a low GPA for his/her Minor, he/she will not be 'penalised' in respect of his/her award classification, which is attached to the Major. On the other hand, if a student has a lower GPA for his/her Major than his/her GPA for the Minor, the Board of Examiners may consider giving the student a higher award classification than that with reference to his/her Major GPA.

28. RECORDING OF DISCIPLINARY ACTIONS IN STUDENTS' RECORDS

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

28.2 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.

28.3 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. The disciplinary probation is normally one year unless otherwise decided by the Student Discipline Committee.

28.4 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 who is subject to disciplinary action.

29. SYLLABI

(Please see pages 53 to 207.)

APPENDIX

(Please see pages 208 to 215.)

Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1110</td></tr>
<tr><td>Subject Title</td><td>Basic Mathematics I – Calculus and Probability & Statistics</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite / Exclusion</td><td>Nil</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to the basic concepts and applications of elementary calculus and statistics. Emphasis will be on the understanding of fundamental concepts and the use of mathematical techniques in handling practical problems in science and engineering.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Apply analytical reasoning to solve problems in science and engineering;
2. Make use of the knowledge of mathematical/statistical techniques and adapt known solutions to various situations;
3. Apply mathematical modeling in problem solving;
4. Demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Syllabus:

<u>Elementary calculus</u>
Limit and continuity, derivatives and their geometric meaning, rules of differentiation including chain rule, Leibniz’s rule and L’Hopital’s rule, exponential and logarithmic functions, trigonometric functions and their inverses, hyperbolic and inverse hyperbolic functions, applications of differential calculus.

<u>Elementary Probability and Statistics</u>
Descriptive statistics, random variables, probability and probability distributions, binomial, Poisson and normal distributions, applications.
Population and random samples. Sampling distributions related to sample mean, sample proportions, and sample variances. Concepts of a point estimator and a confidence interval. Point and interval estimates of a mean and the difference between two means.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Basic concepts and elementary techniques of differential and integral calculus, elementary statistics and linear algebra will be taught in lectures. These will be further enhanced in tutorials through practical problem solving.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Homework, quizzes and mid-term test</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="4"></td></tr>
</table>
</td></tr>
</table>

	Continuous Assessment comprises of assignments, in-class quizzes, online quizzes and a mid-term test. An examination is held at the end of the semester. Questions used in assignments, quizzes, tests and examinations are used to assess students' level of understanding of the basic concepts and their ability to use mathematical techniques in solving problems in science and engineering. To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components. **Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:** The subject focuses on understanding of basic concepts and application of techniques in differential/integral calculus, elementary statistics and elementary linear algebra. As such, an assessment method based mainly on examinations/tests/quizzes is considered appropriate. Furthermore, students are required to submit homework assignments regularly in order to allow subject lecturers to keep track of students' progress in the course.	
Student Study Effort Expected	**Class contact:**	
	• Lecture	26 Hours
	• Tutorial	13 Hours
	Other student study effort:	
	• Homework and self study	81 Hours
	Total student study effort:	**120 Hours**
Reading List and References	1. K.C. Chung, *A Short Course in Calculus and Matrices*, McGraw Hill 2013. 2. K.F. Hung, Wilson Kwan, T.Y. Pong, *Foundation Mathematics & Statistics*, McGraw Hill 2013. 3. R. Larson, B. Edwards, *Single Variable Calculus*, Brooks/Cole 2012. 4. R.E. Walpole, R.H. Myers, S.L. Myers, K Ye, *Probability and Statistics for Engineers and Scientists*, Prentice Hall, 2012.	
Last Updated	August 2017	
Prepared by	AMA Department	

Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1120</td></tr>
<tr><td>Subject Title</td><td>Basic Mathematics II –Calculus and Linear algebra</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite</td><td>AMA1110 Basic Mathematics I – Calculus and Probability & Statistics</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to the basic concepts and applications of elementary calculus and statistics. Emphasis will be on the understanding of fundamental concepts and the use of mathematical techniques in handling practical problems in science and engineering.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Apply analytical reasoning to solve problems in science and engineering;
2. Make use of the knowledge of mathematical/statistical techniques and adapt known solutions to various situations;
3. Apply mathematical modeling in problem solving;
4. Demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Syllabus:

<u>Elementary calculus</u>
Mean Value Theorem with applications to optimization and curve sketching. Definite and indefinite integrals, fundamental theorem of calculus, methods of integration (integration by substitution, integration by parts, integration of rational functions using partial fractions and integration of trigonometric and hyperbolic functions), reduction formulas, applications to geometry and physics. Improper Integrals.

<u>Linear algebra</u>
Basic properties of matrices and determinants, linear systems, Gaussian elimination, inverse of a square matrix, Cramer’s rule, vectors in 2-space or in 3-space, applications to geometry.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Basic concepts and elementary techniques of differential and integral calculus and linear algebra will be taught in lectures. These will be further enhanced in tutorials through practical problem solving.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Homework, quizzes and mid-term test</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="4"></td></tr>
</table>

Continuous Assessment comprises of assignments, in-class quizzes, online quizzes and a mid-term test. An examination is held at the end of the semester.

Questions used in assignments, quizzes, tests and examinations are used to assess students’ level of understanding of the basic concepts and their ability</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">to use mathematical techniques in solving problems in science and engineering.

To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The subject focuses on understanding of basic concepts and application of techniques in differential/integral calculus, elementary statistics and elementary linear algebra. As such, an assessment method based mainly on examinations/tests/quizzes is considered appropriate. Furthermore, students are required to submit homework assignments regularly in order to allow subject lecturers to keep track of students' progress in the course.</td></tr>
<tr><td rowspan="6">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>26 Hours</td></tr>
<tr><td>• Tutorial</td><td>13 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Homework and self-study</td><td>81 Hours</td></tr>
<tr><td>Total student study effort</td><td>120 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">1. K.C. Chung, A Short Course in Calculus and Matrices, McGraw Hill 2013.
2. K.F. Hung, Wilson Kwan, T.Y. Pong, Foundation Mathematics & Statistics, McGraw Hill 2013.
3. R. Larson, B. Edwards, Single Variable Calculus, Brooks/Cole 2012.
4. R. Larson, Elementary Linear Algebra, Brooks/Cole 2013.</td></tr>
<tr><td>Last Updated</td><td colspan="2">August 2017</td></tr>
<tr><td>Prepared by</td><td colspan="2">AMA Department</td></tr>
</table>

Subject Description Form

Subject Code	CBS1104C (Cantonese) / CBS1104P (Putonghua) *Remarks: Students taking the Cantonese version of CBS1104 (i.e. CBS1104C) will be offered a 39 hour non-credit bearing e-learning course in Putonghua (optional).*
Subject Title	University Chinese（大學中文）
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	Students with HKDSE Chinese subject result at level 3 or above or equivalent
Objectives	This subject aims at enhancing the students' command of language knowledge to communicate effectively in both written and spoken Chinese, with particular reference to the stylistic variations of expression in different communicative settings. The ultimate goal of this subject is to train students to be effective communicators and life-long learners, and to equip them for the Chinese Discipline-Specific Language Requirement subject.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Consolidate the ability to identify and correct the most common errors in written texts; 2. Develop Chinese writing skills through the analysis and in-depth reading of selected literary masterpieces; 3. Master the format, organization, language and style of expression of various genres of Chinese writing; 4. Produce formal presentations in spoken Chinese effectively and appropriately
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Written communication Language, format and organization of each genre; coherence and thread of thinking in Chinese writing; style of expression of different genres; context dependent stylistic variation; development of logical and persuasive arguments. 2. Spoken communication Choice of words; articulation and flow of speaking; manner of speaking and gesture; identification of main idea and key messages; evaluation of relevancy of information in a message; skills of summarizing; agreeing / disagreeing / answering to questions politely; use of visual aids; body movement. 3. Reading strategies Intensive and critical reading; identification of authors' stances, arguments and purposes; extracting useful information from the texts; determination of the meanings of the important concept words in context; evaluation of the validity of the factual information and arguments of the texts; appreciation of different genres including literary masterpieces. 4. Language development Grammatical skills; use of clear words; use of specific sentences; choice of diction.

<table>
<tr><td>Teaching/Learning Methodology</td><td>The teaching/learning methodology is a combination of highly interactive seminars, self-formed study groups, seminar discussion, oral presentations and written assignments. E-learning materials for enhancing students' proficiency in both spoken and written Chinese are included in Chinese LCR teaching.

Students are expected to follow teachers' guidelines and get access to the materials on the e-Learning platform for self-study on a voluntary basis.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Quizzes / Exercises</td><td>20%</td><td>√</td><td></td><td>√</td><td></td></tr>
<tr><td>2. Written Assignments</td><td>55%</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3. Oral presentation</td><td>25%</td><td>√</td><td></td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The quizzes and exercises are designed to assess students' basic knowledge of Chinese linguistics and how well they achieve ILOs (1) and (3). The writing assessments aim to obtain an objective measurement of students' basic competence in the use of written Chinese in accurate and appropriate grammatical structures (ref. ILOs (1), (2) and (3)). The oral assessment assesses students' ability to plan and present accurately, appropriately and effectively (ref. ILOs (1), (3) and (4)). Explanations and exercises are provided in classroom teaching.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Seminar</td><td>39 Hours</td></tr>
<tr><td>Additional activity:</td><td></td></tr>
<tr><td>• e-Learning in Putonghua and written Chinese</td><td>9 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Outside Class Practice</td><td>39 Hours</td></tr>
<tr><td>• Self-study</td><td>39 Hours</td></tr>
<tr><td>Total student study effort</td><td>126 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>

1. 于成鯤、陳瑞端、秦扶一、金振邦主編：《當代應用文寫作規範叢書》，上海：復旦大學出版社，2011年。
2. 任伯江：《口語傳意權能：人際關係策略與潛力》，香港：香港中文大學出版社，2006年。
3. 吳禮權：《演講的技巧》，香港：商務印書館，2013年。
4. 李錦昌：《商業溝通與應用文大全》，香港：商務印書館，2012年。
5. 邵敬敏：《現代漢語通論》，上海：上海教育出版社，2007年。
6. 香港城市大學語文學部編著：《中文傳意一基礎篇》。香港：香港城市大學出版社，2001。

</td></tr>
</table>

	7. 香港城市大學語文學部編著; 《中文傳意─寫作篇》。香港 : 香港城市大學出版社，2001。 8. 孫光萱：《中國現代散文名家名篇賞讀》，上海：上海教育出版社，2001年。 9. 梁慧敏：《正識中文》，香港：三聯書店，2010年。 10. 梁慧敏：《語文正解》，香港：三聯書店，2015年。 11. 梁慧敏：《語文通病》，香港：三聯書店，2014年。 12. 陳瑞端，《生活病語》，香港 : 中華書局，2000。 13. 陳瑞端：《生活錯別字》，香港：中華書局，2000年。 14. 賴蘭香：《傳媒中文寫作》(新修本)，香港：中華書局，2012年。
Last Updated	July 2018
Prepared by	CBS Department

Subject Description Form

<table>
<tr><td>Subject Code</td><td>CBS1151</td></tr>
<tr><td>Subject Title</td><td>Chinese I (for non-Chinese speaking students)
漢語 I（非華語學生課程）</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>For non-Chinese speaking students at beginners' level</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce to non-Chinese speaking students with basic phonological structure of modern standard Chinese and enable them to master the Chinese phonology and conduct simple conversation in Chinese.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Master basic pronunciations of Chinese;
2. Make use of the Hanyu Pinyin system as a learning tool and for self-study;
3. Acquire some basic common vocabulary and basic sentence patterns;
4. Comprehend simple messages conveyed in Putonghua;
5. Engage in simple daily communication in Putonghua;</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Syllabus:

1. The Hanyu Pinyin System;
2. The Pronunciation of Phonetic Symbols;
3. The Syllabic Structure of Putonghua;
4. Tone Variation, Neutral Tone and Final Retroflexion ;
5. 100 Characters and 200 Common Words;
6. Common Expressions and Sentence Structure;
7. Simple Daily Conversation;
8. Vocabulary and Expression for Xi'an Tour (for China mode)</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching and learning activities will be in the form of interactive seminars where students will be given a lot of chances to practice. After class consultation forms another major element to maximize communications between students and teachers.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Listening Practice</td><td>20%</td><td>√</td><td></td><td>√</td><td>√</td><td></td></tr>
<tr><td>2. Vocabulary and Grammar Practice</td><td>30%</td><td>√</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Oral Presentation</td><td>20%</td><td>√</td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>4. Conversation Practice</td><td>20%</td><td>√</td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>5. In-class Participation</td><td>10%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total (Continuous Assessment)</td><td>100 %</td><td colspan="5"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessment methods aim to:</td></tr>
</table>

	(1) Distinguish the initials, finals and tones of monosyllables and disyllables and words; (2) Understand the meaning of simple statement and short conversation in actual communicative situations; (3) Present a self-introduction in Chinese; (4) Master the vocabulary and sentence patterns learned; (5) Give the proper answers to the questions asked by teachers; and (6) Know the meaning of basic characters. All assignments are in continuous assessment. Each assignment will be evaluated in terms of criterion reference assessment.	
Student Study Effort Expected	**Class contact:**	
	• Seminar	39 Hours
	Other student study effort:	
	• Outside Class Practice	42 Hours
	• Self-study	42 Hours
	Total student study effort:	**123 Hours**
Student Study Effort Expected (for China mode)	**Class contact:**	
	• Lectures/Seminars/Tutorials	28-39 Hours
	• Study visits	15-20 Hours
	Other student study effort:	
	• Readings/Discussion/Report and Essay Writing/Outside Class Practice/Self-study	64-78 Hours
	Total student study effort:	**107-137 Hours**
Reading List and References	**Textbook:** 劉珣主編：《新實用漢語課本》第一册 (*New Practical Chinese Reader) (Vol.1)*，北京語言大學出版社，2007 年。	
Last Updated	July 2018	
Prepared by	CBS Department	

Subject Description Form

Subject Code	CBS1152
Subject Title	Chinese II (for non-Chinese speaking students) 漢語 II (非華語學生課程）
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	• For non-Chinese speaking students; and • Students who have completed Chinese I or equivalent
Objectives	This subject aims to enhance non-Chinese-speaking students' oral communication skill and their ability in conducting simple daily conversation in Chinese.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Improve their pronunciation in Chinese; 2. Be able to carry out simple conversation; 3. Understand basic sentence patterns in Chinese; 4. Recognize 100 new Chinese characters; 5. Understand and be able to use 200 new words; and 6. Input Chinese by means of Pinyin.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Pronunciation 2. Vocabularies and Grammar 3. Speaking Skills 4. Pragmatics Rules and Implication 5. Cultural Background of China Reflected in Daily Conversation 6. Structure of Chinese Character and Character Writing 7. Conversation on one's own background, immediate environment and matters.
Teaching/Learning Methodology	Teaching and learning activities will be in the form of interactive seminars where students will be given a lot of chances to practice. After class consultation forms another major element to maximize communications between students and teachers.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Listening Practice	10%	√		√	√		
2. Vocabulary and Grammar Practice	25%	√		√	√	√	
3. Oral Presentation	20%	√	√	√		√	
4. Conversation Practice	20%	√	√	√		√	
5. Writing Practice	15%					√	√
6. In-class Participation	10%	√	√	√	√	√	√
Total (Continuous Assessment)	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessment methods aim to:

(1) Distinguish the tones of monosyllables, the neutral tone of disyllables and words;
(2) Understand the meaning of conversation in actual communicative settings;
(3) Conduct a dialogue in designed situations in Chinese;
(4) Master the vocabulary and sentence patterns learned;
(5) Assess the fluency and accuracy of students' Chinese by asking them to recite a text; and
(6) Write Chinese sentences.

All assignments are in continuous assessment. Each assignment will be evaluated in terms of criterion reference assessment.

Student Study Effort Expected		
	Class contact:	
	• Seminar	39 Hours
	Other student study effort:	
	• Outside Class Practice	42 Hours
	• Self-study	29 Hours
	Total student study effort:	**110 Hours**

Reading List and References	**Textbook:** 劉珣主編《新實用漢語課本》第一冊 (*New Practical Chinese Reader (Vol. 1)*，北京語言大學出版社，2007 年。
Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	CBS1153
Subject Title	Elementary Cantonese (Taught in English) 基礎廣東話（以英語授課）
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	For students whose native language is not Cantonese (exclude students whose native language is Cantonese)
Objectives	This subject aims to: • introduce basic phonological structure of modern standard Cantonese to non-Chinese speaking students; and • enable them to put knowledge into practice by conducting simple conversation in Cantonese.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Master basic pronunciations of Cantonese, 2. Make use of the Yue Pin system as a learning tool and for self-study, 3. Acquire some basic vocabularies and basic sentence patterns, 4. Comprehend simple messages conveyed in Cantonese, 5. Engage in simple daily communication in Cantonese.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. The Yue Pin (Jyutping) System 2. The pronunciation of phonetic symbols 3. The syllabic structure of Cantonese 4. Tone variations and change in pronunciation 5. Common expressions and sentence structure 6. Simple daily conversation 7. Common used simple Chinese Characters in Cantonese.
Teaching/Learning Methodology	The course adopts an interactive way of learning/teaching where students will have a lot of chances to put knowledge into practice. In addition to classroom teaching and exercises, group discussion and role-play learning will be the mode of learning. Teacher consultations will also be part of the course.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Listening & Writing Quiz</td><td>20%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Self-introduction</td><td>15%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Translation and Pair Conversation</td><td>15%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>4. Written & Oral Exam</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>5. Classroom Participation</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total (Continuous Assessment)</td><td>100 %</td><td colspan="5"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessments focus on:

(1) Basic knowledge in Cantonese in terms of word and grammar,
(2) The ability to use Cantonese jyutping in reading and writing, and
(3) Speaking in Cantonese, individually and in group work. As interaction is emphasized, class participation is also assessed.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Seminar</td><td>39 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Outside Class Practice</td><td>39 Hours</td></tr>
<tr><td>• Self-study</td><td>39 Hours</td></tr>
<tr><td>Total student study effort:</td><td>117 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>
Required:
1. Chow, Bun-Ching: Cantonese for Everyone (Jyutping version, Hong Kong: The Commercial Press, 2007.

References:
1. Stephen Matthews and Virgina Yip: Cantonese: A Comprehensive Grammar, Routledge, 2011.
2. Chan Kwok Kin, Betty Hung: A Cantonese Book (3rd Edition), Hong Kong: Greenwood Press, 2009.
3. The New Asia – Yale-in-China Chinese Language Center: English-Cantonese Dictionary, Hong Kong: The Chinese University Press, 2000.
4. Chinese Character Database (Phonologically Disambiguated According to the Cantonese Dialect) 中文大學，《粵語審音配詞字典》http://humanum.arts.cuhk.edu.hk/Lexis/lexi-can/
</td></tr>
<tr><td>Last Updated</td><td>July 2016</td></tr>
<tr><td>Prepared by</td><td>CBS Department</td></tr>
</table>

Subject Description Form

<table>
<tr><td>Subject Code</td><td>CBS1153P</td></tr>
<tr><td>Subject Title</td><td>Elementary Cantonese (Taught in Putonghua)
基礎廣東話 (以普通話授課)</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite/Co-requisite/ Exclusion</td><td>For students whose native language is not Cantonese
(exclude students whose native language is Cantonese)</td></tr>
<tr><td>Objectives</td><td>This subject aims to help non-Cantonese speaking students to use Cantonese to communicate with people for daily life contacts in Hong Kong.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Acquire the pronunciation, vocabulary, sentence structure, and some written characters of Cantonese,
2. Deal with daily life business in Hong Kong,
3. To communicate with local students and people,
4. Achieve a wider and deeper understanding of the life of Hong Kong people and their cultural heritage.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>The contents of the syllabus include two major parts: communicative situations and linguistic knowledge of Cantonese. These two domains go in parallel with each other.

There are 10 communicative situations covering themes of interaction such as “Introducing each other”, “Having a phone call”, “Making an appointment”, “Asking where to go in the street”, “Shopping” and the like.

After introducing the phonological systems of Cantonese, in each of the 10 communicative situations, there is a focal point of grammar or in expression. For example, in “Introducing each other”, the way of saying one’s name, and the position of using the adverb “先” in a sentence, will be the focal point of learning and teaching in linguistic terms.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The course adopts an interactive way of learning/teaching where students will have a lot of chances to put knowledge into practice. In addition to classroom learning and exercises, group discussion, and role-play learning, there will be, outside classroom activities such as actual shopping in a market, buying tickets, film watching etc. Teacher consultations will also be part of the course.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Class Participation</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Test of Words & Grammar</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Individual Presentation</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>4. Group Presentation / Report</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total (Continuous Assessment)</td><td>100 %</td><td colspan="4"></td></tr>
</table>
</td></tr>
</table>

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The assessments are in two aspects: (1) Linguistic knowledge which will be assessed by test on word and grammar. (2) Oral presentation means to assess the ability of communication in two manners, individual and group work. As interaction is emphasized, class participation is also assessed.	
Student Study Effort Expected	**Class contact:**	
	• Seminar	39 Hours
	Other student study effort:	
	• Outside Class Activities	35 Hours
	• Self-study	33 Hours
	Total student study effort:	**107 Hours**
Reading List and References	**Required:** 1. 鄭定歐等編：《粵語香港話教程》, 香港：三聯書店出版，2003 年 10 月。 **References** 1. 張洪年：《香港粵語語法的研究》（增訂版），香港中文大學，2007 年。 2. 饒秉才等：《廣州話方言詞典》，商務印書館，1996 年 11 月。 3. 歐陽覺亞：《普通話廣州話的比較與學習》，中國社會科學出版社，1996 年 9 月。 4. 《廣州音字典》（普通話對照），三聯書店（香港）有限公司，1996 年 4 月。 5. 李新魁等：《廣州方言研究》，廣東人民出版社，1995 年 6 月。 6. 曾子凡：《廣州話、普通話口語詞對譯手冊》，三聯書局，1994 年 5 月。 7. 高華年：《廣州方言研究》，商務印書館，1984 年 1 月。	
Last Updated	July 2016	
Prepared by	CBS Department	

Subject Description Form

Subject Code	EIE1002
Subject Title	Electronics Science
Credit Value	3
Level	1
Pre-requisite	Nil
Co-requisite/ Exclusion	Nil
Objectives	To provide a broad treatment of the fundamentals of electronics science with emphasis of multimedia technologies.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the fundamentals of electronics science with its associated components. 2. Appreciate the relationships between the associated components and a variety of devices used in multimedia technologies. 3. Apply the learned fundamentals for achieving a basic understanding on the working principle of a variety of devices used in multimedia technologies. Category B: Attributes for all-roundedness 4. Present ideas and findings effectively. 5. Learn independently. 6. Work in a team and collaborate effectively with others.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to electronics science Basic concept of electricity and its safety issue in the context of product development. Appreciate the three basic characteristics of electronics components; the issue of poor tolerance and its remedies, e.g. use of negative feedback and redundancy. Overview of the two basic components in electronics science: resistors and capacitors with their applications. 2. Introduction to human sensory organs Basic relation between human sensory organs and audiovisual signals. Concept of sound pressure and its associated components and technologies, e.g. speakers, microphones, modern volume control. Concept of image and colours and their associated components and technologies. 3. Analog subsystems Basic concept of amplification and its associated components, e.g. transistor amplifiers. Basic DC power supplies and regulators with the use of negative feedback. 4. Digital subsystems Basic concept of switches and logic circuit implementation in the context of remote control via internet. Operation and design of CMOS logic gates. A simple RC charging circuit and its application in multi-vibrators and timers. **Laboratory Experiments:** 1. CMOS Astable Multi-vibrators 2. Voltage regulators **Case Study:** A selected topic in electronics

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2	fundamental principles and key concepts of the subject are delivered to students
Tutorials	1, 2, 3	students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed
Laboratory sessions	1, 2, 3, 6	students in groups of 2-3 will conduct practical measurement and evaluate the performance of electronic circuits
Case study	3, 4, 5, 6	Each student is required to perform a detailed study on a subject in electronics in a team and present the result independently

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Continuous Assessment	40%						
• Short quizzes		✓					
• Assignments		✓	✓				
• Laboratory sessions, mini-project		✓	✓	✓			✓
• Case study				✓	✓	✓	✓
2. Examination	60%	✓	✓	✓			
Total	100%						

The continuous assessment will consist of a number of assignments and a series of quizzes.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	short quizzes conducted to measure students' understanding on subject materials
Assignments and examination	end-of chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; students need to think critically and creatively in order to come with an alternate solution for an existing problem
Laboratory sessions, mini-project	each student is required to produce a written report; accuracy and the presentation of the report will be assessed;
Case study	each group of students will produce a written report on a selected topic in electronics; students will be assessed based on the content/organization of the report

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	20 Hours
	• Tutorial/Laboratory/Practice Classes/Case Study	19 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; assignment; preparation for quizzes/examination	30 Hours
	• Tutorial/Laboratory/Practice Classes/Case Study: preview of materials, revision and/or reports writing	36 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Textbooks:

1. Floyd, Buchla, Electric circuits fundamentals, 8th ed., Prentice Hall, 2010.
2. Stan Gibilisco, *Teach yourself electricity and electronics*, 3rd ed., McGraw-Hill, 2002.
3. Shamieh, Cathleen, *Electronics for dummies*, 2nd ed., Wiley, 2009.

Reference Books:

1. Larry D. Wolfgang, *Understanding basic electronics*, American Radio Relay League, 1992.
2. Nick Dossis, *Basic electronics for tomorrow's inventors*, Osborne, 2013.

Last Updated	January 2016
Prepared by	Dr Chi-Tsun Cheng

Subject Description Form

Subject Code	ELC1011
Subject Title	Practical English for University Studies
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject aims to develop and enhance students' general proficiency and communication skills in English. A strong focus will be given to enhancing competence and confidence in writing, grammar, vocabulary, pronunciation and fluency.
Intended Subject Learning Outcomes	**Upon successful completion of the subject, students will be able to:** 1. Organise and write accurate and coherent short texts 2. Improve language accuracy and the ability to proofread for common errors in written texts 3. Use appropriate verbal and non-verbal skills to enhance fluency and accuracy in spoken communication such as short presentations To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, select information critically, and present their views logically and coherently.
Subject Synopsis/ Indicative Syllabus	1. Written communication Enhancing the use of accurate and appropriate grammatical structures and vocabulary for various communicative purposes; improving the ability to organise written texts logically; and improving cohesion and coherence in writing. 2. Spoken communication Developing verbal and non-verbal interaction strategies appropriate to the context and level of formality. 3. Reading and listening Understanding the content and structure of information delivered in written and spoken texts; developing effective reading and listening strategies. 4. Language development Improving and extending relevant features of grammar, vocabulary, pronunciation and fluency.
Teaching/Learning Methodology	The study method is primarily seminar-based. Following a blended delivery approach, activities include teacher input as well as in- and out-of-class individual and group work involving drafting of texts, information search, mini-presentations and discussions. Students will make use of elearning resources and web-based work to improve their grammar and vocabulary, and other language skills. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
		1	2	3
1. In-class paragraph writing	20%	✓	✓	
2. Essay writing	40%	✓	✓	
3. Documentary presentation	40%	✓	✓	✓
Total	100 %			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The paragraph writing test, which assess students' grammar, vocabulary and paragraph organization skills, necessitate achievement of LOs (1) and (2).

The essay writing assessment evaluates students' ability write a longer text in accurate and appropriate grammatical structures (ref. LOs (1) and (2)).

The documentary presentation assesses students' ability to speak accurately, appropriately and confidently. Students will research a topic, organise information from a variety of sources, and deliver the information as a digital documentary and mini-presentation (ref. LOs (1), (2) and (3)).

In addition to these assessments, students are required to complete further language training through web-based language work. The additional language training offered in online tasks is aligned with all the three LOs and corresponds to their learning in class.

Student Study Effort Expected

Class contact:	
• Seminar	39 Hours
Other student study effort:	
• Self-study/preparation	78 Hours
Total student study effort	**117 Hours**

Reading List and References

Course material:

Learning materials developed by the English Language Centre

Recommended references:

1. Boyle, J. & Boyle, L. (1998). *Common Spoken English Errors in Hong Kong*. Hong Kong: Longman.
2. Brannan, B. (2003). *A writer's workshop: Crafting paragraphs, building essays (3rd ed.)*. Boston: McGraw-Hill.
3. Hancock, M. (2003). *English pronunciation in use*. Cambridge: Cambridge University Press.
4. Nettle, M. and Hopkins, D. (2003). *Developing grammar in context: Intermediate*. Cambridge: Cambridge University Press.
5. Redman, S. (2003). *English vocabulary in use: Pre-intermediate and intermediate*. Cambridge: Cambridge University Press.
6. Powell, M. (2011). *Presenting in English. How to get successful presentations.* USA. Heinle & Heinle Publishers.

Last Updated	July 2018
Prepared by	English Language Centre

Subject Description Form

Subject Code	ELC1013
Subject Title	English for University Studies (This subject will be offered in two versions for students who will primarily be using (1) APA/Harvard referencing styles or (2) IEEE/Vancouver referencing styles in their university studies.)
Credit Value	3
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Students entering the University with Level 3 – 5** from the HKDSE will be required to take this course.
Objectives	This subject aims to help students study effectively in the University's English medium learning environment, and to improve and develop their English language proficiency within a framework of university study contexts.
Intended Subject Learning Outcomes	**Upon successful completion of the subject, students will be able to:** 1. Refer to sources in written texts and oral presentations 2. Paraphrase and summarise materials from written and spoken sources 3. Plan, write and revise expository essays with references to sources 4. Deliver effective oral presentations To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, select information critically, and present information logically and coherently.
Subject Synopsis/ Indicative Syllabus	1. Written communication • Analysing and practicing common writing functions; improving the ability of writing topic sentences and strategies for paragraph development; understanding common patterns of organization in expository writing; taking notes from written and spoken sources; practicing summarizing and paraphrasing skills; improving coherence and cohesion in writing; developing revision and proofreading skills. 2. Spoken communication • Recognising the purposes of and differences between spoken and written communication in English in university study contexts; identifying and practicing the verbal and non-verbal interaction strategies in oral presentations; developing and applying critical thinking skills to discussions of issues. 3. Language development • Improving and extending relevant features of grammar, vocabulary and pronunciation.
Teaching/Learning Methodology	The study method is primarily seminar-based. Following a blended delivery approach, activities include teacher input as well as in- and out-of-class individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. The process approach to writing is adopted, and students make use of eLearning resources to engage in academic discussions and to reflect on their learning. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		1	2	3	4
1. Academic essay 1	30%	✓	✓	✓	
2. Academic essay 2	30%	✓	✓	✓	
3. Oral presentation	40%	✓	✓		✓
Total	100 %				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessments 1 and 2 necessitate achievement of LOs (1), (2) and (3) in order to write an effective academic essay via the process of extending and improving the essay for assessment 1. In order for students to present an effective academic oral presentation, as demanded in assessment 3, they will need to read, note and synthesize from a variety of sources, and refer to those sources in their presentation (ref. LOs (1), (2) and (4)).

In addition to these assessments, students are required to complete further language training, through web-based language work, reading tasks and online reflections. The additional language training offered in online tasks is aligned with all the four LOs. In some of the tasks, students to critically read and summarize information contained in a variety of sources, as required in LOs (1) and (2).

Student Study Effort Expected

Class contact:	
• Seminars	39 Hours
Other student study effort:	
• Self-study / Preparation	78 Hours
Total student study effort	**117 Hours**

Reading List and References

Course material:

Learning materials developed by the English Language Centre

Recommended references:

1. Bailey, S. (2014). *Academic writing: a handbook for international students*. Abingdon: Routledge.
2. Comfort, J. (2001). *Effective presentations.* Oxford: Cornelsen & Oxford University Press.
3. Hung, T. T. N. (2005). *Understanding English grammar: A course book for Chinese learners of English*. Hong Kong: Hong Kong University Press.
4. Tang, R. (2012). *Academic writing in a second or foreign language: Issues and challenges facing ESL/EFL academic writers in higher education contexts*. London: Continuum International Pub.
5. Zwier, L. J. (2002). *Building academic vocabulary.* Ann Arbor, MI: University of Michigan Press.

Last Updated	July 2018
Prepared by	English Language Centre

Subject Description Form

Subject Code	ENG1003
Subject Title	Freshman Seminar for Engineering
Credit Value	3
Level	1
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	The objectives of this subject are to: 1. Introduce students to the engineering broad discipline and enthuse them about their major study 2. Cultivate students' creativity and problem-solving ability, and global outlook 3. Introduce students to the concept of entrepreneurship 4. Engage the students in desirable forms of learning at university that emphasizes self-regulation, autonomous learning and deep understanding
Intended Subject Learning Outcomes	**Upon completion of the subject, students will:** 1. Be able to demonstrate an understanding and an enthusiasm about the engineering broad discipline and their major study 2. Develop their problem-solving ability and global outlook 3. Be able to demonstrate an understanding of entrepreneurship 4. Be able to research for information, formulate a project plan, and manage a project with initiative 5. Be able to demonstrate an understanding of academic integrity.
Subject Synopsis/ Indicative Syllabus	**1. Online Tutorial on Academic Integrity (4 hours*)** Students will be required to complete successfully an Online Tutorial on Academic Integrity on or before week 5 of the first semester. The students will understand the importance of academic integrity by completing the Online Tutorial. **2. Seminars (12 hours*)** There will be seminars given by various speakers on various topics to introduce to students the engineering broad discipline, to enthuse them about their major study, to arouse students' interests in engineering and to cultivate their understanding of and sense of belonging to the discipline and the engineering profession, and to cultivate students' global outlook. The formats of the seminars may be, but not limited to, Departmental Seminars, and Renowned Speaker Seminar. **3. Freshman Project (45 hours*)** There will be practical workshops, presentation and demonstration sessions for the Freshman Project. The freshman project aims at developing students' creativity, problem-solving skills, research for information, and project management abilities through practical and hands-on tasks at a level commensurate with their first-year engineering backgrounds. Students will work in small groups under the guidance of teachers/instructors to design and implement an engineering solution to some given problems. (* Note: hours indicate total student workload)

	4. Entrepreneurship Project (45 hours*) The entrepreneurship project is designed to develop students' appreciation and understanding about entrepreneurship and the commercialization process by attending lectures, workshops and tutorials. In the course of the Entrepreneurship Project, students will identify technology opportunities and learn the skills of preparing a simple business plan.
Teaching/Learning Methodology	**Online Tutorial on Academic Integrity** The Online Tutorial on Academic Integrity is developed by the University to help the students understand the importance of academic integrity. By going through the Online Tutorial, students will be aware of the importance of upholding academic integrity during University study. They will also learn good practices by which to stay clear of dishonest behaviors and academic plagiarism. **Seminars** The seminars (such as renowned speaker seminars and departmental seminars) are designed to arouse students' interest about engineering. The delivery mode will be interactive and engaging. Students will be motivated to search for information and do background reading. They will be encouraged to raise questions and discuss with the presenters. Assessment tasks (quizzes) will be designed to measure students' learning outcomes as well as to encourage participation and interaction. **Freshman Project** For the Freshman Project, students will work collaboratively with their group members to design and implement an engineering solution to a given problem under the guidance of instructors. There will be close staff-students and students-students interaction. Students will be given opportunities to develop creativity, problem-solving skills, research for information and project management abilities. Assessment tasks will consist of demonstration, presentation, reports, and reflective essay writings. These are designed to evaluate individual student's performance and achievement of the relevant intended learning outcomes as well as to encourage active participation. **Entrepreneurship Project** There will be lectures, workshops, and tutorials. A general overview of the concepts required to conduct the project will be provided to students through lectures. They will then work in small groups in a workshop to appreciate the essential elements in the development of a business plan and subsequently to produce a simple business plan and to present it to fellow classmates. Assessment will focus towards students' understanding about entrepreneurship, innovation and creativity.

Assessment Methods in Alignment with Intended Learning Outcomes

Students' performance in this subject will be assessed by using a letter-grading system in accordance with the University's convention from grade F (failure) to A+. The relative weights of the different assessment components are as follows:

Specific Assessment Methods/Tasks	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**				
		1	**2**	**3**	**4**	**5**
Online Tutorial on Academic Integrity	0%					✓
Seminars Quizzes	10%	✓	✓			
Freshman Project Project demonstration, presentation, report and reflective essay writing	45%		✓		✓	
Entrepreneurship Project Business plan	45%			✓	✓	
Total	100 %					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Quizzes (online or paper-based) can measure the students' *understanding* about the engineering discipline. Through reflective essays, students can reflect on their appreciation and understanding about the *engineering* discipline. Through project demonstration, presentation and project reports, students can demonstrate their *creativity and problem-solving skills abilities*. They can also demonstrate their *ability to research for information*, *formulate a project plan*, and *manage a project with initiative*. Through business plan, students can demonstrate their understanding about *entrepreneurship*.

Pass Conditions

In order to pass this subject, students must obtain a Grade D or above for total marks comprising the Seminars, Freshman Project and Entrepreneurship Project as described here AND pass the Online Tutorial on Academic Integrity on or before week 5 of semester 1 as described in the previous section.

Student Study Effort Expected		
	Class contact:	
	• Introduction and Seminars (such as Departmental Seminars, Renowned Speaker Seminar)	6 Hours
	• Freshman project: 3 hours per week for 5 weeks	15 Hours
	• Entrepreneurship project: 3 hours per week for 5 weeks	15 Hours
	Other student study effort:	
	• 4 hours for Online Tutorial on Academic Integrity; 6 hours for seminars quizzes preparation; 60 hours for Freshman project and Entrepreneurship project: background information search, project work preparation, meeting and discussion, presentation and demonstration, and report writing.	70 Hours
	Total student study effort	**106 Hours**

Reading and References List	1. H. Scott Fogler and Steven E. LeBlanc, *Strategies for creative problem solving*, Upper Saddle River, N.J. : Prentice Hall, 2008. 2. N.J. Smith (ed), *Engineering project management*, Oxford, UK; Malden, MA: Blackwell, 2008. 3. Gene Moriaty, *The engineering project: its nature, ethics, and promise,* University Park, Pa.: Pennsylvania State University Press, 2008. 4. K. Allen, *Entrepreneurship for scientists and engineers*, Upper Saddle River, N.J. : Prentice Hall, 2010. 5. The Hong Kong Institution of Engineers, “Engineering Our City”, Youtube clip ref. no. nYMmI6vlVeQ 6. HKIE Corporate Video, Youtube clip ref. no. lNMVl8MuNEY
Last Updated	June 2017
Prepared by	Faculty of Engineering

Subject Description Form

Subject Code	CBS2101P
Subject Title	Putonghua in the Workplace **(**職業普通話**)**
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Remarks: • Students have completed "Fundamentals of Chinese Communication" or could demonstrate the proof with basic Putonghua proficiency • For students who are non native Putonghua speakers
Objectives	This subject aims to enhance students' communication skills in Putonghua by improving their pronunciation, ways of expression and pragmatic skills to enable them to communicate more effectively in the workplace.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to**: 1. Improve their pronunciation and master the conventional ways of expression in Putonghua; 2. Communicate efficiently in Putonghua with accuracy of pronunciation and fluency in the flow of speaking; 3. Perform communicative tasks in the business context; 4. Adopt appropriate pragmatic devices underlying business communication in China; 5. Understand the social and cultural background of China as reflected in business communications in China.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Comprehensive Revision on Putonghua Communication Skills 1.1. Common Pronunciation Errors 1.2. Vocabularies and Common Expressions 1.3. Special Grammatical Features 2. In-depth Practice on Putonghua Listening Comprehension Skills 2.1. Speed and Accent 2.2. Causal Speech vs. Speech on Specialized Topics 2.3. Quantity and Structure of Information 2.4. Pragmatic Rules and Implications 3. Business Communication 3.1. Common Pragmatic Devices in Business Communications 3.2. Stylistic and Rhetorical Variations in Spoken Communications in accordance to Contextual Changes 3.3. Communicative Tasks in the Business Setting: Inquiry, Introduction, Presentation, Promotion, Question & Answer, Negotiation etc. 3.4. Commonly Used Jargons for Business and Administration 4. Social and Cultural Background of China 4.1. Different tactics adopted in different circumstances for business negotiation 4.2. Social and cultural differences between mainland and Hong Kong
Teaching/Learning Methodology	Interactive seminars with listening exercises, presentation drills, recitation, group discussion, situational pair conversation and role play; after-class self-learning hours will be required with resources provided; consultation hours will be available depending on individual students' needs. For the acquisition of social and cultural conventions in mainland China, role play will be conducted in illustrative social settings.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Presentation	25%	√	√	√	√	√
2. Recitation	20%	√	√			
3. Listening	15%	√	√	√	√	√
4. Dialogue	20%	√	√	√	√	√
5. Spoken words	10%	√				√
6. Attendance and participation	10%	√	√	√	√	√
Total (Continuous Assessment)	100 %					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The modes of speech production for assessment are communication patterns commonly used across various professional contexts. The assessments will be designed with reference to the authentic social settings in the professions. All assessments will be criteria-referenced based which covers aspects in linguistic competence and communicative competence.

Student Study Effort Expected

Class contact:	
• Seminar	39 Hours
Other student study effort:	
• Outside Class Practice	42 Hours
• Self-study	45 Hours
Total student study effort:	**126 Hours**

Reading List and References

Required

1. 香港理工大學中國語文教學中心編：《商貿普通話教程》（上、下冊），中華書局，2005年。

Reference

1. 《現代漢語詞典（第6版）》，北京：商務印書館，2012年。
2. 張泰平編著：《國際商務漢語教程》，北京：北京大學出版社，2003年。
3. 蔡富春主編：《中國商務應用文書手冊》，香港：經濟日報出版社，2002年。
4. 李聰華著，李山根、顏慧真等譯：《中國：消費者革命》，香港：三聯書店，1999年。
5. 陳建民編著：《普通話常用口語詞和句》，香港：香港普通話研習社，1998年。
6. 楊長進等編：《商貿普通9000句》，香港：壹出版有限公司，1994年。

Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

<table>
<tr><td>Subject Code</td><td>CBS2102P</td></tr>
<tr><td>Subject Title</td><td>Creative Writing in Chinese （中文創意寫作）</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>2</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>• For students entering with HKDSE level 4 or above; or
• Students entering with advanced competence level as determined by the entry assessment; or
• Students who have completed “Fundamentals of Chinese Communication”</td></tr>
<tr><td>Objectives</td><td>This subject aims to enhance students’ competence in Chinese creative writing, through the study of selected novels and critical approaches and participation in workshops on writing techniques for different genres.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Demonstrate an understanding of the features and the principles for literary creation through the study of novels with different themes;
2. Compose creative works with literary and artistic techniques and rhetorical style;
3. Produce creative pieces under the guidance after given ample opportunities to participate in the discussion of writing techniques.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>1. Principles of literary creation

2. Approaches to literary writing
• themes in literature
• artistic techniques and rhetorical style
• demonstration and practice on literary writing

3. Literary criticism of selected works</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The subject will be conducted in highly interactive seminars and will motivate the students’ active participation by assigning group presentation /discussion in class. In a forum-like format, students are guided to:

(1) Present to the class, their understanding of the novel themes selected for the syllabus for discussions;
(2) Engage in formal discussion on topics related to the literary creation, and
(3) Engage in actual literary writing</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th></tr>
<tr><td>1. Oral criticism of literary works (in group)</td><td>30%</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Criticism article writing (individual)</td><td>30%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Creative work writing (in group)</td><td>30%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>4. Class participation</td><td>10%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total (Continuous Assessments)</td><td>100 %</td><td colspan="3"></td></tr>
</table>
</td></tr>
</table>

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The assessments will focus on students' level of appreciation of literary works and originality in producing creative writing such as drama script (in group work). The criteria for assessment are choice of words, sentential expressions, direction of moves in writing, style and creativity.	
Student Study Effort Expected	**Class contact:**	
	• Seminar	39 Hours
	Other student study effort:	
	• Outside Class Practice	42 Hours
	• Self-study	45 Hours
	Total student study effort:	**126 Hours**
Reading List and References	科幻小說： 1. 田中芳樹（2014）。《銀河英雄傳說》。海南：南海出版公司。 2. 埃里克·尼倫德（2005）。《光暈：致遠星的淪陷》。成都：四川科学技术出版社。 3. 阿瑟·克拉克（2006）。《童年的終結》。成都：四川科学技术出版社。 4. 凱特·威廉（2007）。《遲暮鳥語》。成都：四川科学技术出版社。 推理小說： 5. 松本清張（2006）。《砂之器》。台灣：獨步文化。 6. 史迪格·拉森（2008）。《龍紋身的女孩》。台灣：寂寞出版。 7. 尤·奈斯博（2011）。《知更鳥的賭注》。台灣：漫遊者文化。 8. 高野和明（2013）。《種族滅絕》。台灣：獨步文化。 戰爭小說： 9. 普羅斯佩·梅里美（2010）。〈奪堡記〉。《梅里美精选集》。北京：北京燕山出版社 。 10. 埃米爾·左拉（2014）。《磨坊之役：左拉中篇小說選》。上海：上海三聯書店。 11. 阿爾封斯·都德（2010）。〈柏林之圍〉。《都德小说选》。北京：人民文学出版社。 12. 尼伊·德·莫泊桑 （2010）。〈菲菲小姐〉。《读名著学语文：莫泊桑短篇小说精选》。北京：中国对外翻译出版公司。 歷史小說： 13. 唐浩明（2002）。《唐浩明文集－－曾國藩（上中下冊）》。北京：人民文学出版社。 14. 姚雪垠（2005）。《李自成》。北京：人民文学出版社。 政治小說： 15. 喬森·奧威爾（2010）。《1984》。北京：北京十月文艺出版社。 16. 李昂（2010）。《北港香爐人人插》。台灣：九歌出版社。 17. 丸谷才一（2015）。《假聲低唱君之代》。台灣：聯經出版公司。 18. 梁啟超（2008）。《新中國未來記》。廣西：广西师范大学出版社。 宗教小說： 19. 丹·布朗（2004）。《達芬奇密碼》。上海：上海人民出版社。 20. 楊·馬特爾（2005）。《少年 Pi 的奇幻漂流》。江蘇：译林出版社。	

	其他： 21. 王安憶（2005）。《小説家的十三堂課》。上海：上海文藝出版社。 22. 余我（1999）。《現代文學寫作技巧》。台北：五南圖書出版公司。 23. 張德明（1995）。《文學語言描寫技巧》。北京：中國青年出版社。 24. 陳家生（1992）。《文學寫作技法入門》。福州：海峽文藝出版社。
Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	CBS2103P
Subject Title	Chinese and the Multimedia（中文與多媒體）
Credit Value	3
Level	2
Pre-requisite/Co-requisite/ Exclusion	Remarks: • For students entering with HKDSE level 4 or above; or • Students entering with advanced competence level as determined by the entry assessment; or • Students who have completed "Fundamentals of Chinese Communication"
Objectives	This subject introduces students to the principles and practices of multimedia design and implementation, with emphasis on the function and practice of Chinese communication in multimedia contexts. It prepares students for a convergent, multidisciplinary world by featuring writing for print, broadcast, and online media in a variety of strategic disciplines. Through a variety of designated tasks, students will learn to produce effective writing for public relations, advertising, sales and marketing in the digital age.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Analyze linguistic and extra-linguistic features of Chinese used in multimedia contexts; 2. Display familiarity with the unique Chinese writing conventions for multimedia; 3. Identify the features (such as purpose, audience, media, format and design) of different strategic writing in multimedia contexts; 4. Analyze writing situations and invoke the roles and strategies necessary to produce effective writing; and 5. Use, adapt and evaluate various writing skills put to the use of specific rhetorical purposes in multimedia contexts. Category B: Attributes for all-roundedness 6. Be adaptable to the demands of techniques, technologies, culture and problems of multimedia writing in the digital age; 7. Apply strategies for collaborating successfully and equitably with peers on developing documents; and 8. Develop conceptual skills and critical thinking in relation to multimedia communication.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** • Concept of human communication. • Typical and extra-linguistic features of Chinese media texts. • Characteristics of media including texts, sounds, images, graphics, videos and animations. • The similarities and differences between print-style writing and broadcast style writing. • Strategic writing in public relations: Newsletter Web Writing Radio News Releases Video News Releases • Strategic writing in advertising:

<table>
<tr><td></td><td>Print Advertisements
Radio Advertisements
Television Advertisements
• Writing stories for magazines:
Interview Report
News Story
Feature Stories</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>This subject will mainly be in the form of lectures interspersed with small group discussions. By using real-life examples, a tight link between theoretical input and practical applications will be made. Students are required to work individually and in small groups to develop their own language and analytical skills.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><th rowspan="2">Specific Assessment Methods/Tasks</th><th rowspan="2">% Weighting</th><th colspan="8">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr>
<tr><td>1. 2 short essays</td><td>60%</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>2. 1 group project</td><td>40%</td><td></td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total (Continuous Assessment)</td><td>100 %</td><td colspan="8"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

100% of the assessment for this subject is based on coursework in terms of both subject knowledge and Chinese communication skills in multimedia contexts.

60% will be based on 2 written assignments (at 30% each) which evaluate students' writing strategies and skills necessary to produce effective multimedia communication.

40% will be based on a group project on the analysis of Chinese media text collected from multimedia communication. The group project will also include an end-of-semester oral presentation.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>26 Hours</td></tr>
<tr><td>• Tutorial</td><td>13 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Project and Blended Learning</td><td>87 Hours</td></tr>
<tr><td>Total student study effort:</td><td>126 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>1. 李明哲：《多媒體互動新聞寫作：理論與實務》，台北：五南，2013 年。
2. 李錦昌：《商業溝通與應用文大全》，香港：商務印書館，2012 年。
3. 賴蘭香：《傳媒中文寫作》(全新修訂本)，香港：中華書局，2012 年。
4. 馮凱等編著：《影視廣告視聽語言》，上海：上海交通大學出版社，2009 年。
5. 徐恒醇：《設計符號學》，北京：清華大學出版社，2008 年。
6. 周至禹：《思維與設計》，北京：北京大學出版社，2007 年。
7. 蔣宏、徐劍：《新媒體導論》，上海：上海交通大學出版社，2006 年。
8. 裴顯生、方延明主編：《新聞寫作教程》，北京：高等教育出版社，2005 年。</td></tr>
</table>

	9. 宋春陽、孟德東、張志攀：《實用新聞寫作概論》，上海：復旦大學出版社，2004 年。 10. 羅鳳珠主編：《語言、文學與資訊》，新竹：國立清華大學 出版社，2004 年。 11. 高志宏、徐智明：《廣告文案寫作》，北京：中國物價出版社，2002 年。 12. 黎運漢：《商業語言》，台北：商務印書館，2001 年。 13. 張道俊：《廣告語言技法》，北京：社會科學文獻出版社，1996 年。 14. 邵敬敏：《廣告語創作透視》，北京：北京語言學院出版社，1996 年。 15. David Crystal: *Language and the Internet,* New York: Cambridge University Press, 2006. 16. Timothy Garrand: *Writing for Multimedia and The Web,* Burlington: Elsevier Focal Press, 2006. 17. Charles Marsh, David W. Guth, Bonnie Poovey Short: *Strategic writing: multimedia writing for public relations, advertising, sales and marketing, and business communication,* Boston : Pearson Allyn and Bacon, 2005.
Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	CBS2151
Subject Title	Chinese III (for non-Chinese speaking students) 漢語 III（非華語學生課程）
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	• For non-Chinese speaking students at higher competence levels; and • Students who have completed Chinese II or equivalent
Objectives	This subject aims to further improve non-Chinese-speaking students' Chinese ability and oral communication skill in Chinese by expanding the vocabulary and mastering more sentence structures.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Further cultivate their Putonghua communicative ability and handle basic daily conversation; 2. Recognize 100 new characters; 3. Understand and use 250 new words; 4. Use basic Chinese sentence structures to create short narratives; 5. Handle Chinese character input.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Pronunciation and Intonation 2. Vocabularies, Expressions and Grammar 3. Speaking Skills 4. Colloquial Expressions vs. Formal Expressions 5. Conversation on familiar matters regularly encountered in work, school, leisure, etc. 6. Sentence Writing 7. Further Practice of Character Input
Teaching/Learning Methodology	Teaching and learning activities will be in the form of interactive seminars where students will be given a lot of chances to practice. After class consultation forms another major element to maximize communications between students and teachers.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Dictation	10%		√	√		
2. Vocabulary and Grammar Practice	10%		√	√	√	
3. Oral Practice	30%	√	√	√	√	
4. Writing Practice	40%	√	√	√	√	√
5. In-class Participation	10%	√	√	√	√	√
Total (Continuous Assessment)	100 %					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessment methods aim to:

(1) Understand the meaning of conversation in actual communicative settings and paragraph;
(2) Conduct a presentation on given topics and give the proper answers to the questions raised by teacher;
(3) Conduct a dialogue in designed situations in Chinese;
(4) Master the vocabulary and sentence patterns learned; and
(5) Read and write Chinese passage.

All assignments are in continuous assessment. Each assignment will be evaluated in terms of criterion reference assessment.

Student Study Effort Expected	**Class contact:**	
	• Seminar	39 Hours
	Other student study effort:	
	• Outside Class Practice	42 Hours
	• Self-study	42 Hours
	Total student study effort:	**123 Hours**

Reading List and References

Textbook:

劉珣主編：《新實用漢語課本》第二冊 (*New Practical Chinese Reader) (Vol.2)*，北京語言大學出版社，2007 年。

Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	CBS2152
Subject Title	Chinese Literature – Linguistics and Cultural Perspectives (for non-Chinese speaking students) 中國文學、語言與文化面面觀（非華語學生課程）
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	For non-Chinese speaking students at higher competence levels
Objectives	This subject aims to provide non-Chinese speaking students with Chinese training in twofold: (1) linguistic knowledge in Chinese language, Chinese literature and some inherent cultural subjects; (2) more advanced level vocabularies and expression structures for listening, speaking, reading and writing skills in Modern Standard Chinese.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Acquire a basic understanding of the basic features and varieties of the Chinese language; 2. Master 2400 useful Chinese words altogether; 3. Recognize 900 Chinese characters altogether; 4. Understand how Chinese culture affects the Chinese language; 5. Attain some basic knowledge of the major genres of the Chinese literature; 6. Understand the underlying aesthetic and cultural values through Chinese operas, Chinese calligraphy and Chinese painting; 7. Acquire the spirits of Confucianism and Daoism as manifested in some great works of the Chinese literature.
Subject Synopsis/ Indicative Syllabus	• Chinese language and Chinese dialects • Chinese cuisine-cultural perspective • Major genres of Chinese literature • Chinese myths and Chinese folklores • Varieties of Chinese opera • Main streams of Chinese philosophy and religion
Teaching/Learning Methodology	The subject will be delivered in mass lectures, group discussion and presentation. The course will be using different forms of teaching materials such as movie clip, real life conversations, art performances etc. for illustrations. Students will be required to conduct some simple and basic research in a given topic related to the subject matter. They will be asked to present their findings during tutorials as well as in a term paper.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)						
		1	2	3	4	5	6	7
1. Oral Presentation	25%		√			√	√	√
2. Dictation	10%	√	√	√				
3. Essays	30%	√	√	√	√	√	√	√
4. Final Test	25%	√	√	√	√	√	√	√
5. In-class Participation	10%	√	√	√	√	√	√	√
Total (Continuous Assessment)	100 %							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessment takes a criterion-referenced approach for all the required tasks. The areas of evaluation cover non-Chinese students' language abilities, their understanding of Chinese language, literature and the inherent cultural phenomenon as manifested in their viewpoints and ways of expression.

Student Study Effort Expected		
	Class contact:	
	• Seminar	39 Hours
	• **Other student study effort:**	
	• Assignment / Quiz	10 Hours
	• Self-study	63 Hours
	Total student study effort:	**112 Hours**

Reading List and References

Textbook:

劉珣主編：《新實用漢語課本》第三冊 (*New Practical Chinese Reader) (Vol.3)*，北京語言大學出版社，2007 年。

Reference:

1. 史迹、陳越編：《文化全景：中級漢語教程》，高等教育出版社，第 1 版，2009 年 10 月 1 日。
2. 王海龍著：《解讀中國：中國文化閱讀教程 2》，北京大學出版社，第 1 版，2008 年 1 月 1 日。
3. 王海龍著：《文化中國：中國文化閱讀教程 1》，北京大學出版社，第 1 版，2002 年 8 月 1 日。
4. Chih-p'ng Chou, Wei Wang & Joanne Chiang: Readings in Contemporary Chinese Cinema: A Textbook of Advanced Modern Chinese (中國側影), Princeton University, 2005.
5. Jianhua Bai, Juyu Sung, Hesheng Zhang: Across the Straits (兩岸對話), Cheng & Tsui, June 1, 1999.

Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	CBS2153
Subject Title	Intermediate Cantonese (Taught in English) 中級廣東話（以英語授課）
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	Successful completion of CBS1153 [Elementary Cantonese (Taught in English)] or CBS 1153P [Elementary Cantonese (Taught in Putonghua)] or meet a certain standard in a pre-course assessment.
Objectives	This subject aims to enhance the ability of students to listen and speak Cantonese for communicative tasks of considerable complexity.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Pronounce accurately by better management of the tones of Cantonese; 2. Use more vocabulary and different sentence patterns to conduct communicative tasks including negotiation and giving instructions; 3. Comprehend simple messages conveyed in Cantonese; 4. Use simple Cantonese idiom/slang; 5. Recognize often used Chinese Characters in Cantonese.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Revision of Yue Pin (Jyutping) System; 2. Comparing the pronunciation of English and Cantonese in order to have better management of tones of Cantonese; 3. Communicative tasks: buying and bargaining, asking for direction, taking public transportation, etc. 4. Teaching the meaning, usage and pronunciation of simple Cantonese idioms/slang; 5. Using Cantonese to complete an oral presentation of a field -trip experience; 6. Dictation
Teaching/Learning Methodology	Teaching and learning activities will be in the form of interactive seminars where students will be given a lot of chances to practice. After class consultation forms another major element to maximize communications between students and teachers.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Listening practice</td><td>40%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Oral presentation</td><td>40%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Class attendance & class performance</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>4. Total (Continuous Assessment)</td><td>100 %</td><td colspan="5"></td></tr>
</table>
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Seminar</td><td>39 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ outside class practice</td><td>39 Hours</td></tr>
<tr><td>▪ self-study</td><td>39 Hours</td></tr>
<tr><td>Total student study effort:</td><td>117 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Textbook:

1. Bun-Ching Chow (2013) Cantonese for Everyone (Jyutping version), The Commercial Press.
2. Yip, Virginia and Stephen Matthews (2001) Intermediate Cantonese: A Grammar and Workbook. Routledge, xiv+200pp, hardback ISBN 0-415-19386-9, Routledge Grammars.
3. Yip, Virginia and Stephen Matthews (2000) Basic Cantonese: A Grammar and Workbook. London: Routledge.
4. Bauer, Robert S. & Paul K. Benedict (1997) Modern Cantonese Phonology. Berlin: Mouton de Gruyter.
5. Kwan Choi Wah (1996) The Right Word in Cantonese (Enlarged Edition). Hong Kong: The Commercial Press.
6. Lo Wood Wai & Tam Fee Yin (1996) _Interesting Colloquial Cantonese Expressions. Hong Kong: The Chinese University Press.
7. Matthews, Stephen, & Virginia Yip (1994) Cantonese: A Comprehensive Grammar. London: Routledge.
8. Tong, Keith S. T., & Gregory James (1994) Colloquial Cantonese: A Complete Language Course. London: Routledge.
9. Kwan Choi Wah, et al. (1991) English-Cantonese Dictionary: Cantonese in Yale Romanization. Hong Kong: New Asia--Yale-in-China Chinese Language Center, The Chinese University of Hong Kong.
10. Chik Hon Man & Ng Lam Sim Yuk (1989) Chinese-English Dictionary: Cantonese in Yale Romanization; Mandarin in Pinyin. Hong Kong: New Asia--Yale-in-China Chinese Language Center, The Chinese University of Hong Kong.</td></tr>
<tr><td>Last Updated</td><td>July 2016</td></tr>
<tr><td>Prepared by</td><td>CBS Department</td></tr>
</table>

Subject Description Form

<table>
<tr><td>Subject Code</td><td>CBS2154</td></tr>
<tr><td>Subject Title</td><td>Chinese IV (for Non-Chinese speaking students)
漢語 IV（非華語學生課程）</td></tr>
<tr><td>Credit Value</td><td>3</td></tr>
<tr><td>Level</td><td>2</td></tr>
<tr><td>Pre-requisite/
Co-requisite/
Exclusion</td><td>• For non-Chinese students at intermediate competence levels; and
• Students who have completed Chinese III or equivalent</td></tr>
<tr><td>Objectives</td><td>This subject aims to further enhance non-Chinese-speaking students' oral communication skill in Chinese and their ability in reading and writing with Chinese characters.</td></tr>
<tr><td>Intended Subject Learning Outcomes</td><td>Upon completion of the subject, students will be able to:

1. Master 1200 useful Chinese words altogether;
2. Recognize 600 Chinese characters altogether;
3. Master basic grammar patterns and related expressions;
4. Read and write passage in Chinese.</td></tr>
<tr><td>Subject Synopsis/
Indicative Syllabus</td><td>Syllabus:
1. Intonation
2. Grammar
3. Colloquial expressions vs. formal expressions
4. Pragmatics rules and implication
5. Cultural background of China reflected in expressions
6. Conversation on topics of personal interest such as dreams, hopes and ambitions, etc.
7. Writing passage in Chinese</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching and learning activities will be in the form of interactive seminars where students will be given a lot of chances to practice. They will be encouraged to participate in after class consultation and to take part in authentic language activities to maximize communications between students and teachers.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Listening practice</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Vocabulary and grammar practice</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Oral presentation</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>4. Writing practice</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>5. Reading and Speaking</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>6. In-class participation</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total (Continuous Assessment)</td><td>100%</td><td colspan="4"></td></tr>
</table>
</td></tr>
</table>

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Building up vocabulary and grammar capacity is an important outcome of this subject. Students should endeavor to acquire the targeted number and range of vocabularies as well as grammar patterns. Such requirement is embedded in all the assessment items listed below. **1. Listening practice** Students are asked to listen to dialogues and short passages and give answers in written Chinese to questions about the content so as to demonstrate their level of aural competency. **2. Vocabulary and grammar practice** Although knowledge of Chinese characters, words and grammar patterns are emphasized throughout the course of learning, and the acquisition of such underlies all the assessments, students' performance in vocabulary and grammar will be separately assessed so as to show the importance of such knowledge. For instance, they will be asked to write sentences with given vocabulary and to correct sentences with grammatical errors. **3. Oral presentation** Students are asked to make presentation on a book they like or their dreams/hopes/ambition or an interesting thing they want to share with the class. They have to give spontaneous responses to questions on their presentations so as to demonstrate the ability to engage in simple conversation. **4. Writing practice** Students are asked to write two compositions on daily life topics so as to demonstrate their mastery of some commonly used vocabularies, grammar patterns and ways of expressions. . **5. Reading and speaking** Students are asked to read a narrative passage with about 200 characters and retell the content in spoken form afterward. They have to answer teacher's questions about the story as well. **6. In-class participation** As the lessons are conducted in an interactive manner, discussions, short exercises and other learning activities are conducted during classes, and thus students' participation is assessed. All assignments are in the form continuous assessment. Each assignment will be evaluated with the criterion-reference approach.	
Student Study Effort Expected	**Class contact:**	
	• Seminar	39 Hours
	Other student study effort:	
	• outside class practice	36 Hours
	• self-study	36 Hours
	Total student study effort	**111 Hours**
Reading List and References	刘珣主编 (2007) 《新实用汉语课本》第二册 (*New Practical Chinese Reader) (Vol.2)*, 北京语言大学出版社。	
Last Updated	August 2017	
Prepared by	CBS Department	

Subject Description Form

Subject Code	EIE2105
Subject Title	Digital and Computer Systems
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with the foundation knowledge in digital systems and the organization and architecture of a computer
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the fundamentals of digital systems and associated technologies; 2. Understand the architecture and organization of microprocessors; 3. Understand the functions and features of components in a computer.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Number Systems, Operations, and Codes Binary, octal and hexadecimal numbers; base conversions 1's complement, 2's complement and binary arithmetic Binary-coded-decimal (BCD) representation Floating-point numbers 2. The Basics of Logic Design Gates, truth tables, and logic equations Combinational logic Constructing a basic arithmetic logic unit Sequential logic: Clocks, Counters, Flip-flops, latches, and registers Programmable Logic (PAL, PLA, FPGAs) 3. Microprocessor Design Basics Basic organization of a microprocessor Building a simple datapath The control unit Example: x86 microprocessor organization 4. Instruction Set Architecture Basic computer operation cycle Register set Operand addressing Addressing modes Types of instructions Example: x86 instruction set architecture 5. Introduction to Computer Systems Internal organization of computers Working principle of computer systems Types of computer systems Buses and memories Measurement of computer performance

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 3	Supplementary to lectures are conducted with smaller class size. The students will be able to clarify concepts and to have a better understanding of the lecture material. Some exercises and application examples are given for discussion.
Assignments	1, 2, 3	Through working assignment and end-of-chapter problems in text books, students will develop a firm understanding and comprehension of the knowledge taught.
Laboratory sessions	1, 2, 3	Students will make use of the software and hardware tools to develop simple digital systems and perform simulations.

Alignment of Assessment and Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)		
		1	2	3
1. Continuous Assessment (total 50%)				
• Assignments		✓	✓	✓
- homework	15%			
- Class question/ participation	5%			
• Test	20%	✓	✓	✓
• Laboratory sessions	10%	✓	✓	✓
2. Examination	50%	✓	✓	✓
Total	100%			

The continuous assessment will consist of two assignments, laboratory exercises and a midterm test.

<table>
<tr><td></td><td colspan="2">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

<table>
<tr><th>Specific Assessment Methods/Tasks</th><th>Remark</th></tr>
<tr><td>Assignments, tests and examination</td><td>End-of chapter type problems are used to evaluate students' ability in applying concepts and skills learned in class. Larger individual assignments will bet set in order to challenge students to apply the course contents in a more realistic setting.

Students are needed to think critically and creatively in order to come with an alternate solution for an existing problem.</td></tr>
<tr><td>Laboratory sessions</td><td>Each student is required to answer several questions related to each lab session in the lab sheet and hand in his/her answers.</td></tr>
</table>
</td></tr>
<tr><td rowspan="7">Student Study Effort Required</td><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes</td><td>15 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Textbooks:

1. M.M. Mano and C.R. Kime, Logic and Computer Design Fundamentals, 4th ed., Upper Saddle River, NJ: Prentice-Hall, 2008.

Reference Books:

1. M. Rafiquzzaman, Fundamentals of Digital Logic and Microcomputer Design, 5th ed., John Wiley & Sons, 2005.
2. B. Brey, The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor: Architecture, Programming and Interfacing, 7th ed., 2005.
3. D.A. Patterson and J.L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, 4th ed., Morgan Kaumann Publishers, 2009.</td></tr>
<tr><td>Last Updated</td><td colspan="2">February 2018</td></tr>
<tr><td>Prepared by</td><td colspan="2">Dr Gang Li</td></tr>
</table>

Subject Description Form

Subject Code	EIE2106
Subject Title	Signal and System Analysis
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	1. To provide students with basic concepts in signal acquisition and analysis techniques. 2. To provide students with an analytical foundation for further studies in Communication Engineering and Digital Signal Processing.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the representations and classifications of the signals and systems. 2. Understand the time domain and frequency domain representations of continuous-time signals. 3. Use different techniques to analyze continuous-time systems. 4. Apply software tools to laboratory exercises for experimenting with theories, and to the analysis of continuous-time signals and systems. 5. Understand the acquisition process of discrete-time signals. Category B: Attributes for all-roundedness 6. Present ideas and findings effectively. 7. Think critically and learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction Basic principle of signal acquisition devices and systems: speech and audio signals, images and videos, electroencephalography signals, etc. Human perception of signals. Mathematical representation of signals: Revision of complex numbers, the Euler theorem, sinusoidal waves and phasor representation. 2. Fourier Representations for Continuous-Time Signals Revision of definite and indefinite integrations. The Fourier series. Concept of frequency and spectrum. The Fourier Series and Fourier Transform. Frequency domain representation of continuous-time signals. 3. Continuous-time System Analysis Properties of continuous-time systems: causality, time Invariance, linearity. Linear time invariant (LTI) continuous-time system and convolution integral. Frequency response of LTI continuous-time systems. Ideal filters: filter classifications, ideal filter frequency responses, bandwidth. Examples of filters. 4. Digital Signal Acquisition Sample-and-hold. Analogue-to-digital (A/D) and digital-to-analogue (D/A) conversion. Quantization. Fourier transform of discrete-time signals. Sampling and aliasing. Shannon sampling theorem and Nyquist rate. Introduction to the discrete Fourier transform.

5. Programming in Matlab
   Matrix operations and variables. Plots and graphics. Programming constructs.

Laboratory experiments:

1. Lab 1: Introduction to Matlab programming
2. Lab 2: Signal Analysis using Fourier Series
3. Lab 3: Signal Analysis using Fourier Transform

Teaching/ Learning Methodology

Teaching and Learning Method	**Intended Subject Learning Outcome**	**Remarks**
Lectures	1, 2, 3, 5, 7	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 3, 5, 7	These are supplementary to lectures. Students will be able to clarify concepts and to gain a deeper understanding of the lecture material. Problems and application examples are given and discussed.
Laboratory sessions	3, 4, 6, 7	Students will make use of the software MATLAB to simulate various theories and visualize the results.

Alignment of Assessment and Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**						
		1	**2**	**3**	**4**	**5**	**6**	**7**
1. Continuous Assessment (total 40%)								
• Laboratory sessions	9%			✓	✓		✓	✓
• Short quizzes	13%	✓	✓	✓		✓		
• Tests	18%	✓	✓	✓		✓		✓
2. Examination	60%	✓	✓	✓		✓		✓
Total	100%							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes and assignments	They can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.
Tests and examination	End-of-chapter-type problems are used to evaluate the students' ability in applying concepts and skills learnt in the classroom; Students need to think critically and to learn independently in order to come up with an alternative solution to an existing problem. They need to present their solutions in a logical and systematic manner in the tests and the examination.
Laboratory sessions	Oral examination based on the laboratory exercises will be conducted to evaluate student's technical knowledge and communication skills.

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

References:

1. Chaparro, Luis F., *Signals and systems using* MATLAB, Academic Press, 2nd Edition, 2014.
2. M.J. Roberts, *Fundamentals of Signals & Systems,* McGraw-Hill, 2008.
3. James H. McClellan, Ronald W. Schafer and Mark A. Yoder, *Signal Processing First,* Prentice-Hall, 2003.

Last Updated	March 2018
Prepared by	Dr Bonnie Law

Subject Description Form

Subject Code	ELC2011
Subject Title	Advanced English Reading and Writing Skills
Credit Value	3
Level	2
Pre-requisite	ELC1012 or ELC1013 English for University Studies
Objectives	This subject aims to help students become more effective readers and writers. It focuses on developing students' facility to read a variety of texts in a critical manner, both intensively and extensively; and to write texts that demonstrate knowledge and insight.
Intended Subject Learning Outcomes	**Upon successful completion of the subject, students will be able to examine a variety of texts, including literary texts, and:** 1. Reflect on and critically analyze texts of different genres and styles, identifying the writer's aims and stance 2. Identify and evaluate language used to make claims and support these with valid arguments 3. Write a text on a chosen topic that includes their opinion and interpretation of some key issues and demonstrates critical thinking and creativity
Subject Synopsis / Indicative Syllabus	**Reading strategies** Reading extensively to appreciate the use of language, acquire information, promote understanding, and develop empathy. Reading intensively to investigate a particular topic and develop an in-depth understanding of issues and stances. Reading critically to extract implications, identify writers' assumptions and purposes, and analyze issues raised in texts written from different perspectives. **Writing strategies** Describing and analyzing the structure, meaning and characteristics of a variety of texts. Presenting views and arguments to educated readers with sophisticated language and appropriate visual images and formats.
Teaching/Learning Methodology	The study method is primarily seminar-based. Following a blended learning approach, activities include teacher input as well as in- and out-of-class work involving sharing and discussion of reading experiences; and reading, evaluating and drafting texts. The process approach to writing is adopted, and students make use of e-learning resources to engage in discussions and to reflect on their learning. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
		1	2	3
1. Reflective writing	20%	✓		
2. Analyzing genres of writing	40%	✓	✓	
3. Feature article writing	40%			✓
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessment 1 requires students to write a reflection after reading a range of literary genres and sharing their ideas in class; and is aligned with ILO (1). Assessment 2 (an in-class assessment) requires students to employ effective critical reading and thinking skills to interpret texts, identify the writer's style and stance, and evaluate the choice of language used; and is aligned with ILOs (1) and (2). Assessment 3 requires students to first conduct research and gain some insight into a particular topic, then produce an article which can inform and impress readers through its substance, structure and language; and is aligned with ILO (3). Through these assessments, students will be able to develop and demonstrate more advanced reading and writing skills.

Student Study Effort Expected

Class contact:	
Seminars	39 Hours
Other student study effort:	
Online forums and blogs Readings and sharing session preparation Research and drafting/revising of texts	78 Hours
Total student study effort:	**117 Hours**

Reading List and References

Course material:

Learning materials developed by the English Language Centre

Recommended references:

1. Best, J. (2001). *Damned lies and statistics: Untangling numbers from the media, politicians, and activists.* Berkeley, CA: University of California Press.
2. Cooper, S. & Patton, R. (2010). *Writing logically, thinking critically.* New York, NY: Longman.
3. Damer, T. E. (2009). *Attacking faulty reasoning: A practical guide to fallacy-free arguments.* Belmont, CA: Wadsworth Cengage Learning.
4. Kennedy, X. J. & Gioia, D. (2010). *Literature: An introduction to fiction, poetry, drama, and writing* (11th ed.). New York, NY: Longman.
5. Mefcalfe, M. (2006). *Reading critically at university.* Thousand Oaks, CA: Sage.

Last Updated	July 2018
Prepared by	English Language Centre

Subject Description Form

Subject Code	ELC2012
Subject Title	Persuasive Communication
Credit Value	3
Level	2
Pre-requisite	ELC1012 or ELC1013 English for University Studies
Objectives	This subject aims to help students become more persuasive communicators in a variety of contexts that they may encounter at university and in the workplace.
Intended Subject Learning Outcomes	**By the end of the subject, students should be able to communicate effectively in an English-medium environment through:** 1. Writing persuasive texts intended for a variety of audiences 2. Communicating persuasively in oral contexts 3. Make persuasive arguments in formal discussions To achieve these, students are expected to use language and text structure appropriate to the context, select information critically, and present and support stance and opinion.
Subject Synopsis/ Indicative Syllabus	1. Preparing for effective persuasion Assessing the situation; selecting relevant content; organising ideas and information; selecting an appropriate tone, distance and level of formality to support the communication of messages. 2. Persuasion through writing Developing and practising appropriate language, tone, style and structure; achieving cohesion and coherence. 3. Persuasion through speaking Developing and practising appropriate verbal and non-verbal skills for persuasive oral communication; improving and extending relevant pronunciation features, including articulation, pausing, intonation, word stress and sentence stress.
Teaching/Learning Methodology	The study method is primarily seminar-based. Activities include teacher input as well as individual and group work involving reading and appreciating texts, discussions and presentations of ideas. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th></tr>
<tr><td>1. Speech</td><td>30%</td><td></td><td>✓</td><td></td></tr>
<tr><td>2. Persuasive written text</td><td>40%</td><td>✓</td><td></td><td></td></tr>
<tr><td>3. Debate</td><td>30%</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Assessment 1 is an individual speech. Assessment 2 concentrates on persuasive writing. Assessment 3 examines a different aspect of persuasion, the debate.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Seminars</td><td>39 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Self study/preparation</td><td>78 Hours</td></tr>
<tr><td>Total student study effort:</td><td>117 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>
Required readings:
ELC-provided subject materials.

Other readings:
1. Breaden, B. L. (1996). Speaking to persuade. Fort Worth, TX: Harcourt Brace College.
2. Covino, W.A. (1998). The elements of persuasion. Boston: Allyn and Bacon.
3. Edwards, R. E. (2008). Competitive debate: The official guide. New York: Alpha Books.
4. Leanne, S. (2008). Say it like Obama: The power of speaking with purpose and vision. New York: McGraw Hill.
5. Rogers, W. (2007). Persuasion: messages, receivers, and contexts. Lanham, MD: Rowman & Littlefield Publishers.
6. Stiff, J. B. (2003). Persuasive communication (2nd ed.). New York: Guilford Press.
</td></tr>
<tr><td>Last Updated</td><td>July 2018</td></tr>
<tr><td>Prepared by</td><td>English Language Centre</td></tr>
</table>

Subject Description Form

Subject Code	ELC2013
Subject Title	English in Literature and Film
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: English for University Studies (ELC1012/1013)
Objectives	This subject aims to introduce students to a range of literary genres in English as well as to enable them to consider differences in media representations of genres, and to appreciate and negotiate the meanings of a variety of literary texts. It is also intended that the subject will help students further develop literacy, as well as higher order thinking and life-long learning skills.
Intended Subject Learning Outcomes	**Upon successful completion of the subject, students will be able to:** 1. Examine and analyse literary texts from different perspectives 2. Discuss literary techniques employed by writers 3. Appreciate and articulate differences in textual and visual media representations 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.
Subject Synopsis/ Indicative Syllabus	1. Written communication Describing and interpreting content and language in literary texts; employing appropriate grammatical structures and vocabulary. 2. Spoken communication Presenting critical evaluation of literary works effectively and convincingly. 3. Reading Developing understanding of and competence in using literary devices such as metaphor, simile and symbolism, via reading literary texts and viewing film versions. 4. Language development Improving fluency and pronunciation, and extending grammatical and lexical competence.
Teaching/Learning Methodology	The study method is primarily seminar-based. Following a blended delivery approach, activities include teacher input as well as in- and out-of-class individual and group work involving listening to and viewing a variety of audio-visual sources, reading and drafting texts, conducting internet research, making mini-presentations, participating in discussions, and comparing various representations of literature. Students will make use of elearning resources and web-based work to further improve their English literacy skills. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th></tr>
<tr><td>1. Individual Essay</td><td>40%</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Group Presentation</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Individual Project</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

In assessment 1, students are required to write an individual paper in which they critically reflect on their reading of prose, and by so doing, demonstrate their achievement of LO (1). Assessments 2 and 3 are aligned with all three LOs. Assessment 2 assesses students' understanding of a literary drama and requires comparison of the merits of its textual and theatrical versions. Assessment 3 is an individual project that requires interpretation and presentation of more creative literature and audio-visual sources.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Seminars</td><td>39 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Self study/preparation</td><td>78 Hours</td></tr>
<tr><td>Total student study effort:</td><td>117 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>
Recommended reading:
The PolyU library retains either hardcopies or electronic copies of the following titles. The titles can also be found online.

Stam, R., and Raengo, A. (eds.). (2004). A companion to literature and film. [electronic source] Blackwell reference online. Malden: Blackwell. Call number PN1995.3.C65 2004eb http://www.blackwellreference.com/subscriber/uid=262/book?id=g9780631230533_9780631230533&authstatuscode=202

Other readings will be specified by the ELC teacher, and may contain short fiction, novelettes, plays and poetry.
</td></tr>
<tr><td>Last Updated</td><td>July 2018</td></tr>
<tr><td>Prepared by</td><td>English Language Centre</td></tr>
</table>

Subject Description Form

Subject Code	ELC2014
Subject Title	Advanced English for University Studies
Credit Value	3
Level	2
Pre-requisite	ELC1012 or ELC1013 English for University Studies (unless exempted)
Objectives	This subject aims to help students study effectively in the University's English medium learning environment, and to improve and develop their English language proficiency within a framework of university study contexts.
Intended Subject Learning Outcomes	**Upon successful completion of the subject, students will be able to:** 1. Research relevant academic texts for a topic and integrate the sources into a position argument essay appropriately and effectively; 2. Plan, research for, write and revise a position argument essay; and 3. Present and justify views effectively in a mini oral defence. 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 logically and persuasively.
Subject Synopsis/ Indicative Syllabus	1. Written communication Developing logical and persuasive arguments; applying a variety of organisation patterns in discursive writing, including the writing of explanatory and evaluative texts; selecting information from academic texts critically; supporting stance; maintaining cohesion and coherence in discursive writing; achieving appropriate style and tone. 2. Spoken communication Enhancing and practising the specific oral and aural skills required to participate effectively in an academic discussion and to present and justify views in an oral defence. 3. Reading and listening Understanding the content and structure of information in oral and written texts; comprehending, inferring and evaluating messages and attitude. 4. Language development Improving and extending relevant features of grammar, vocabulary and pronunciation.
Teaching/Learning Methodology	The study method is primarily seminar-based. Following a blended delivery approach, activities include teacher input as well as in- and out-of-class individual and group work involving drafting and evaluating texts, mini-presentations, discussions and simulations. The process approach to writing is adopted, and students make use of elearning resources to engage in academic discussions and to reflect on their learning. Learning materials developed by the English Language Centre are used throughout the course. Students will be referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials will be recommended as required.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
		1	2	3
1. Position Argument Essay (draft)	20%	✓	✓	
2. Academic Presentation & discussion	35%	✓		✓
3. Position Argument Essay (final)	45%	✓	✓	
Total	100 %			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessments 1 and 3 assess students' abilities to produce a coherent academic text which requires research, and effective use and referencing of sources (ref. LOs (1) and (2)). Assessment 2 assesses their abilities to plan, present and justify their views in an oral defence (ref. LOs (1) and (3)).

In addition to their assessments, students complete further language training by carrying out academic research and by completing a variety of independent-learning tasks focusing on grammar and academic skills such as paraphrasing and discussion strategies.

Student Study Effort Expected

Class contact:	
• Seminars	39 Hours
Other student study effort:	
• Self study/preparation	78 Hours
Total student study effort:	**117 Hours**

Reading List and References

Course material:

Learning materials developed by the English Language Centre

Recommended references:

1. Davies, B. (2012). *Reading research: A user friendly guide for health professionals* (5th ed.). Toronto, ON: Elsevier Canada.
2. Faigley, L. (2012). *Backpack writing: Reflecting, arguing, informing, analyzing, evaluating* (3rd ed.). Boston, MA: Pearson.
3. Madden, C. and Rohlck, T. N. (1997). *Discussion and interaction in the academic community*. Ann Arbor, MI: University of Michigan Press.
4. McWhorter, K. T. (2007). *Academic reading* (6th ed.). New York, NY: Pearson/Longman
5. Oshima, A. & Hogue, A. (2006). *Writing academic English* (4th ed.). White Plains, NY: Pearson/Longman.
6. Reinhart, S. M. (2013). *Giving academic presentations* (2nd ed.). Ann Arbor, MI: University of Michigan Press.
7. Rost, M. (2013). *Active listening.* Harlow, England: Pearson.
8. Wood, N. V. (2012). *Perspectives on argument* (7th ed.). Boston, MA: Pearson.

Last Updated	July 2018
Prepared by	English Language Centre

Subject Description Form

Subject Code	ENG2002
Subject Title	Computer Programming
Credit Value	3
Level	2
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	(i) To introduce the fundamental concepts of computer programming (ii) To equip students with sound skills in C/C++ programming language (iii) To equip students with techniques for developing structured and object-oriented computer programs (iv) To demonstrate the techniques for implementing engineering applications using computer programs.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Familiarize themselves with at least one C/C++ programming environment. 2. Be proficient in using the basic constructs of C/C++ to develop a computer program. 3. Develop a structured and documented computer program. 4. Understand the fundamentals of object-oriented programming and be able to apply it in computer program development. 5. Apply computer programming techniques to solve practical engineering problems.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to programming - Components of a computer; Programming environment; Process of application development. 2. Bolts and Nuts of C/C++ - Preprocessor; Program code; Functions; Comments; Variables and constants; Expressions and statements; Operators. 3. Program Flow Control - Branching and looping; Function parameters passing; Return values; Local and global variables; Scope of variables. 4. Program Design and Debugging - Structured program design; Debugging a program. Case study: Using the Visual C++ debugger. 5. Basic Object Oriented Programming - Objects and classes; Private versus public; Implementing class methods; Constructors and destructors. 6. Pointer and Array - Stack and Free store; Create and delete objects in the free store; Pointer arithmetic; Passing function arguments by pointer; Returning values by pointer; Array of objects; Array and pointer; Array of pointers; Pointer of array; Character array; Command-line processing. 7. Stream I/O - Input and output as streams; File I/O using streams.

Teaching/Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures, supplemented with short quizzes	2,3,4	Students are introduced to the knowledge of computer programming through explanation and illustrative examples. Comprehension of the knowledge is strengthened with short quizzes. Students will be able to monitor the skills of using C/C++ and apply the techniques of developing structured object-oriented applications.
Laboratories/tutorials where problems are given to students for them to solve	1,2,3,4	Students apply what they have learnt in lectures and solve problems in exercises. The purpose is to ensure students have captured the important points. Tutors will aid the lecturer in helping the students finishing the exercises, and interactive Q&A will take place.
Assignment, tests and final examination	1,2,3,4,5	By doing assignment, students will develop a firm understanding and comprehension of the knowledge taught. They will analyse given C/C++ applications and apply knowledge to solve problems. They will have to design solutions by evaluating different alternatives. To enhance the students' problem solving skill in a given programming environment, open-book programming tests are arranged regularly. To assure students' understanding of fundamental concepts, a closed-book final examination is arranged.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended subject learning outcomes to be assessed				
		1	2	3	4	5
1. In-class exercises	10%	✓	✓	✓	✓	
2. Short-quizzes	10%		✓	✓	✓	
3. Programming tests	30%	✓	✓	✓	✓	✓
4. Assignment	20%	✓	✓	✓	✓	✓
5. Final examination	30%	✓	✓	✓	✓	✓
Total	100%					

	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: The short-quizzes are for assessing the understanding of fundamental concepts. The in-class exercises are conducted to help students familiarized with the programming language and skills. The programming tests are for assessing the ability of students on solving computer problems through programming within a specified period. Through doing assignment, students will be able to experience how to solve computer problems and design solutions by using a systematic approach. The final examination is for assessing the students' ability on using the programming language and analysing computer programs.	
Student Study Effort Expected	**Class contact:**	
	• Lectures, Tests and Quizzes	26 Hours
	• Laboratory/Tutorial	13 Hours
	Other student study effort:	
	• Self-studying	57 Hours
	• Homework	12 Hours
	Total student study effort:	**108 Hours**
Reading List and References	**Reference Books:** 1. S. Rao, *Sams Teach Yourself C++ in One Hour a Day*, 8th ed. Indianapolis, IN: Sams, 2017. 2. P. Deitel and H. Deitel*, C++ How to Program : Introducing the New C++14 Standard*, 10th ed. Boston, MA: Pearson, 2017. 3. R. Cadenhead and J Liberty, *Sams Teach Yourself C++ in 24 hours,* 6th ed. Indianapolis, IN: Sams, 2017.	
Last Updated	July 2018	
Prepared by	Faculty of Engineering	

Subject Description Form

Subject Code	ENG2003
Subject Title	Information Technology
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	To provide the foundation knowledge in internet applications, computer networks, and database management that is essential to modern information system design
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the functions and features of modern computing systems. 2. Understand the client-server architecture and be able to set up multiple internet applications. 3. Understand the principles of computer networks and be able to set up simple computer networks. 4. Understand the basic structure of a database system and be able to set up a simple database system. Category B: Attributes for all-roundedness 5. Solve problems using systematic approaches.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to computers Introduction to information technology using Internet of Things as a real life example. Introduction to modern computing systems. 2. Computer Networks Introduction to computer networks (Client-Server Architecture). Study different internet applications (HTTP/FTP/DNS). Explain basic concepts on packet routing (Data Encapsulation/IP Addressing/Functions of Routers). Introduction to basic network security measures. 3. Introduction to data processing and information systems Database systems – architecture, relational database concept, structural query language (SQL), database management systems, Web and database linking, database application development. Introduction to Information systems. Workflow management. Case study: Database design, implementation and management.
Teaching/Learning Methodology	There will be a mix of lectures, tutorials, and laboratory sessions/workshops to facilitate effective learning. Students will be given case studies to understand and practice the usage of modern information systems.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Quizzes (in tutorials)	3%	√	√	√		√
2. Quizzes (in lectures)	14%	√	√	√	√	√
3. Workshops	14%	√	√	√	√	√
4. Mid-term Test	11%	√	√	√		√
5. Assignment	8%				√	√
6. Examination	50%	√	√	√	√	√
Total	100 %					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessment methods include an end-of-subject 2-hour written examination (total 50%) and other assessment methods (total 50%), including quizzes, a mid-term test, workshops, and an assignment, which cover intended subject learning outcomes 1, 2, 3, 4, and 5.

Student Study Effort Expected	**Class contact:**	
	• Lectures (18), tutorials (6), and workshops (15)	39 Hours
	Other student study effort:	
	• Workshops preparation (6/workshop)	30 Hours
	• Self study (3/week)	39 Hours
	Total student study effort	**108 Hours**

Reading List and References

1. B. Williams and S. Sawyer, *Using Information Technology: A Practical Introduction to Computers and Communications*, 11th ed., McGraw-Hill, 2014.
2. J. F. Kurose and K. W. Ross, *Computer Networking: A Top-Down Approach*, 7th ed., Pearson, 2016.
3. D. E. Comer, *Computer Networks and Internets*, 6th ed., Pearson, 2015.
4. B. A. Forouzan, *TCP/IP Protocol Suite*, 4th ed., Tmh, 2010.
5. W. Stalling, *Data and Computer Communications*, 10th ed., Pearson, 2013.
6. S. Morris and C. Coronel, *Database Systems: Design, Implementation, and Management*, 11th Edition, Course Technology, 2014.
7. M. Mannino, *Database Design, Application Development, & Administration*. 6th ed., Chicago Business Press, 2014.

Last Updated	July 2018
Prepared by	Faculty of Engineering

Subject Description Form

Subject Code	IC2140
Subject Title	Practical Training
Credit Value	5 Training Credits
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The objective of this subject is to provide hands-on technical training to students with focus on multimedia electronic product fabrication and development. Training on practical scientific computing software will also be provided. Practical training will be conducted in Industrial Centre (IC) of the university to prepare student for a professional career.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Design and fabricate multimedia electronic product prototype for demonstration, development and experimentation purposes; 2. Use electronic design automation software to product circuit and perform simple pcb design; 3. Understand, specify and explain contemporary pragmatic manufacturing processes, interconnects and assembly methods for simple multimedia electronic product; 4. Prescribe and perform parametric test, analysis and troubleshooting of simple electronic circuits; and 5. Use scientific computation software in academic study.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1 Electronic Product Assembly Design & Practice (42 hours) 1.1 Electronic schematic capture and design process practice 1.2 Application and use of electronic test instruments: current and voltage measurements, two wire and four wire techniques, power and signal sources, oscilloscope probes, analogue and digital oscilloscopes. 1.3 Introduction to virtual instrument, application and hands-on practice on Labview or an equivalent software package. 1.4 Introduction to electronic circuit interconnect technologies: SMT, COB and wave-soldering. 1.5 Introduction to electronic assembly design and manufacturing process, components, tools and machines. 1.6 Hands-on practice on wave-soldering, SMT process, chip level wire bonding, chip-on-board encapsulation, LCD display attachment with heat seal connector. 1.7 Introduction to advanced electronic packaging and assembly process: fine-pitch SMT, BGA, Flip-chip and CSP. 1.8 Soldering quality of BGA assembly and X-ray inspection machine. 2 Advanced Electronic Practice with Multimedia Application (60 hours) 2.1 Training in design modification from circuit prototype for multimedia application. 2.2 Embedded device programming practice for multimedia electronic product. 2.3 Multimedia electronic product prototype fabrication. 2.4 Testing and troubleshooting techniques in multimedia electronic product. 2.5 Project presentation using Internet.

	3 Application of Computing Tool (21 hours) 3.1 Introduction to MATLAB; interactive calculations, random number generators, variables, vectors, matrices and string; mathematical operations, polynomial operation, data analysis and curve fitting, file I/O functions. Basic 2D and 3D plots. 3.2 M-file programming & debugging; scripts, functions, logic operations, flow control, introduction to graphical user interface. 4 Microcomputer Application and Practice (27 hours) 4.1 Introduction to Microchip Microcomputer families and development tools. 4.2 Hands-on practice on memory, I/O, data communications, ADC operations. 4.3 Hands-on practice on LED and LCD displays. 4.4 Hands-on practice on motor control and sensors. 4.5 Application of Microcomputer on consumer electronic products, mechatronics, home automation products, wired and wireless connectivity. **Training Pattern:** Year 1, Summer
Teaching/Learning Methodology	The teaching and learning approach is based on practical workshop training arranged in modules and it can be broadly divided into two parts based on their contents; practice in multimedia electronic product and scientific computing: (i) Training in multimedia electronic product practice will enable student to learn the requirement of practical electronic product fabrication, appreciate the fabrication process so as to create, develop and integrate their knowledge into future design. On completion of the training, student should be able to manage the fabrication of multimedia electronic product prototype for design and development. In "Electronic Product Assembly Design & Practice", student will learn the basics of electronic product construction practice, printed circuit assembly prototype construction skills, techniques and best practice of the electronic industry. Training activities will include tutorials, practical assignments, test and report. Student will work on microcomputer programming for embedded application. In "Advanced Electronic Practice with Multimedia Application", students will participate in training groups under an industrial environment with an objective to produce a prototype of electronic product. The product will normally contain multimedia feature with embedded controller. Student will develop the product under an electronic design automation environment and tackle different parts of product design so as to produce a working prototype for demonstration. Student will experience practical problems that are commonly encountered in the electronic industry during product development. Student will derive solutions to overcome difficulties, produce deliverables for the project in a given time frame. Individual merit will be assessed together with group performance. As such, the training task and activities will be organized in a way to enable a clear identification of work involved while allowing students to work independently and in groups for assessment. Besides fabrication technologies and prototype implementation, students should be able to cultivate their personal quality, creativity, management skills and leadership in teamwork collaborations. Tutorials and inductions will be provided as require. In addition to the quality and output of the practical tasks such as PCB assembly fabrication, chassis fabrication, prototype testing and demonstration, assessment will include creativeness and a web site for product presentation on the Internet. (ii) In "Application of Computing Tools", student will learn to use MATLAB.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Assignment / Project	30%	✓	✓	✓	✓	✓
2. Test	30%	✓	✓	✓	✓	✓
3. Report and Logbook	40%	✓	✓	✓	✓	✓
Total	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assessment Methods	Remarks
Assignment/ Project	Project is designed to facilitate students to reflect and apply the knowledge periodically throughout the training.
Test	Test is designed to facilitate students to review the breadth and depth of their understanding on specific topics.
Report and Logbook	Report writing is designed to facilitate students to acquire deep understanding on the topics of the training and to present those concepts clearly.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture/Tutorial	16 Hours
• Workshop	134 Hours
Total student study effort:	**150 Hours**

Reading List and References

Reference Reading List:

1. Holly Moore, *MATLAB for Engineers*, 4th ED. 2015, Prentice Hall/Pearson.
2. R.S. Villanucci, A.W. Avtgis, W.F. Megow, *Electronic Techniques: Shop Practices and Construction*, 7th ed., Practice-Hall, 2002.
3. IPC-D-279-1996, Design Guidelines for Reliable Surface Mount Technology Printed Board Assemblies, IPC.
4. IPC-J-STD-001F-2014, *Requirements for Soldered Electrical and Electronic Assemblies*, IPC.
5. IPC-A-610F-2014, *Acceptability of Electronic Assemblies*, IPC.

Reference Software List:

1. PADS from Mentor Graphics Inc.
2. LabVIEW from National Instrument.
3. MPLAB from Microchip Corp.
4. MATLAB from The Mathworks.

Last Updated: July 2017

Prepared by: Industrial Centre

Subject Description Form

Subject Code	SD2983
Subject Title	Design Communication and Principles
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	1. To introduce students the fundamental knowledge of design communication through understanding visual rhetoric and fundamental design principles. 2. To develop student's ability in creating artworks for multimedia design and exploring creative methods to convey rich visual context.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Professional/academic knowledge and skills 1. Identify visual vocabulary and visual grammar; 2. Critically analyze the application of visual culture and design strategy; 3. Organize graphic elements to enhance the usage of visual rhetoric and design principles; 4. Explain and give examples by manipulating design principles; 5. Compose images and text to produce visuals to convey pre-determined design theme; 6. Analyze visual elements and their effects, and compare the relevancy of their visuality in a specific design context Attitudes of all-roundedness 7. Exercise project management skills 8. Recognize professional design process 9. Communicate through effective presentations 10. Document the design learning process in a reflective log book
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Communication design practice Communication design and aesthetics, creativity and communication, visual communication design methods 2. Design principles unity, harmony, repetition, emphasis, scale and proportion, contrast, gradation, balance, symmetry, rhythm, etc. 3. Visual elements dot, line, shape, volume, texture, illusion of space, colour , etc.
Teaching/ Learning Methodology	**This subject will engage students by:** Lecture • Lectures will be used to build up students' fundamental concepts and principles in design communication, visual literacy and design principles Studio • Studio and workshops will be used to let students to learn and practice visual designs, including manipulation of images, graphics and photographic images

Project

- The project will be used to develop student's ability to explore the methods of creating visual elements and the application of design principles to communicate simple messages through class and home assignments.

Presentation

- The presentation emphasizes on developing student's organization and communication skills. Key learning components are the organization of visual materials for presentation and the communication skills, verbally and visually.

Tutorial

- The project tutorial will help the students to generate ideas, visualize ideas and provide them appropriate direction for their project development.

Design critique

- Project critique to let students organize the project development process and thoughts, encourage them to leverage the vocabulary and knowledge acquired in this subject to critique others intelligently.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/ Task	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Continuous Assessment											
• Written assignment	10%		√		√		√				√
• Studio	30%	√		√		√	√		√	√	
• Assignment & Project	60%	√	√	√		√	√	√	√	√	
Total	100%										

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Written assignments are given to students for them to analyze the underlying visual literacy and design principles of the selected western paintings, and explain how these principles transfer from one design situation to another;

Workshops are organized to let students to learn and practice design skills to realize design ideas, explore different design themes, generates layout and sketches, to production of final artworks.

Students form group to work on a project to execute a design solution based on the methodology and design principles introduced. Students are required to participate in tutorials, design critique, and present their works towards the end. Also, each student is required to maintain a process book which details their experience and explorations during the project period.

Student Study Effort Required	**Class contact (time-tabled):**	
	• Lecture/Tutorial/Critique/Presentation	27 Hours
	• Studio & workshop	12 Hours
	Other student study effort:	
	• Assignments	30 Hours
	• Project	40 Hours
	Total student study effort:	**109 Hours**
Reading List and References	**Reference books:** 1. R. Landa, *2D: visual basics for designers*, New York: Thomson/Delmar Learning, 2007. 2. A. Fletcher, *The Art of Looking Sideways*, London: Phaidon Press, 2001. 3. M. Johnson, *Problem Solved: A Primer for Design and Communication*, London: Phaidon Press, 2002. 4. E. Resnick, *Design for Communication: Conceptual Graphic Design Basics*, New York: John Wiley & Sons, 2003. 5. J. Wilde and R. Wilde, *Visual Literacy: A Conceptual Approach to Graphic Problem Solving*, New York: Watson-Guptill Publications, 2000.	
Last Updated	June 2016	
Prepared by	School of Design	

Subject Description Form

Subject Code	SD2984
Subject Title	3D Graphics and Animation Fundamentals
Credit Value	3
Level	2
Pre-requisite	Design Communication and Principles (SD2983)
Co-requisite/ Exclusion	Nil
Objectives	1. To introduce students a solid foundation in 3D graphics design and animation principles. 2. To provide students hands-on experience in designing and creating 3D artifacts with the open-source animation software, Blender.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Professional/academic knowledge and skills 1. Recognize and understand core principles of 3D computer graphics design and 3D assets production; 2. Identify the production process of 3D modeling, surfacing and rendering 3D images; 3. Realize styles and trends in professional 3D content creation; 4. Apply skills creating 3D characters, props and environment scenes Attitudes of all-roundedness 5. Create 3D artifacts for multimedia content solution 6. Visualize ideas and concepts considering aesthetic principles 7. Communicate and collaborate professionally with creative personnel
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to 3D graphics 3D CG production process and appreciation of different styles of design and mechanics of motion in animation production. 2. Animation Principles of animation and the distinction between 2D and 3D. 3. Conceptualize ideas Develop story scenarios; concept artworks and production artworks. 4. 3D Computer animation 3D character, scenery and environment design. Create and construct 3D scenes. 5. Professional practice Project planning and asset management. The interface and basic operation of Blender.

<table>
<tr><td>Teaching/ Learning Methodology</td><td>

- Lectures which introduce aesthetics and basic design principles in the application of 3D graphics and animation productions. Students are required to conduct case studies to understand the performance and criteria of different design strategies.
- Students must participate in workshop exercises to learn and practice skills in order to implement their design ideas.
- Students form in small groups to work on assignments to realize taught theories and practical skills.
- Critiques which facilitate students to learn from peers and share their design and execution.

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<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>

<table>
<tr><th rowspan="2">Specific Assessment Methods/ Task</th><th rowspan="2">% Weighting</th><th colspan="7">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td>Continuous Assessment</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Written assignment</td><td>10%</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td>✓</td><td></td></tr>
<tr><td>• Workshop and assignments</td><td>50%</td><td>✓</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>• Presentation and Critique</td><td>40%</td><td></td><td>✓</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="7"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Written assignment is given to students for them to study the professional practice from industry and applications of design strategy in content creation and development.

Workshops are organized to let students to learn and practice visualization skills and basic operations in Blender creating scene and 3D assets. Students are asked to complete specific tasks in each workshop and apply the taught principles in their creative works.

Students form groups to work on assignments to create simple 3D scenes and short animation sequence. Towards end of the course, students are required to present their design from idea generation, artworks development to technical treatment handling their short animation sequence.

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<tr><td>Student Study Effort Required</td><td>

<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture/Tutorial/Critique/Presentation</td><td>13 Hours</td></tr>
<tr><td>• Workshop</td><td>26 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Self-practice</td><td>36 Hours</td></tr>
<tr><td>• Assignments</td><td>50 Hours</td></tr>
<tr><td>Total student study effort:</td><td>125 Hours</td></tr>
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</table>

Reading List and References	**Reference Books:** 1. P. Blair, *Cartoon animation*, Walter Foster Pub., 1994. 2. C. Patmore, *The complete animation course: the principles, practice and techniques of successful animation*, Barron's, 2003. 3. T. Mullen, *Mastering Blender,* Indianapolis, Ind.: Wiley, 2013. 4. B. Strong, *Creating game art of 3D engines*, Charles River Media, 2008. 5. F. Thomas and O. Johnston, *Disney animation: the illusion of life*, Abbeville Press, 1984. 6. R. Williams, *The animator's survival kit*, Faber and Faber, 2001.
Last Updated	June 2016
Prepared by	School of Design

Subject Description Form

Subject Code	AF3625
Subject Title	Engineering Economics
Credit Value	3
Level	3
Exclusion	AF2618
Objectives	This subject aims to equip students with 1. The fundamental concepts of micro- and macroeconomics related to the engineering industry; 2. The fundamental understanding of finance and costing for engineering operations, budgetary planning and control.
Intended Subject Learning Outcomes	**Upon successful completion of this subject, students will be able to:** 1. Understand how the relevant economic factors shape the environment within which an engineering company operates; 2. Evaluate the financial condition of a company based on the financial statements; 3. Apply the basic cost accounting techniques in the planning and control of engineering and production activities.
Subject Synopsis/ Indicative Syllabus	<u>Economic Environment of a Firm</u> **Microeconomic Factors** Scarcity, choice and opportunity cost; Demand, supply and price; Profit-maximizing behavior of the firm; Organization of industry: perfect competition and monopoly **Macroeconomic Factors** International trade and globalization <u>Accounting and Engineering Economics</u> Financial statements; Financial ratio analysis; Return on investment; Composition of cost; Cost-volume-profit analysis; Accounting profit versus economic profit <u>Fundamentals of Budgetary Planning and Control</u> Principle types of budgets for production and service operations; Approaches to budgeting and the budgeting process; Investment and source of finance; Cost of capital; Evaluation of investment alternatives
Teaching/ Learning Methodology	The two-hour lecture each week focuses on the introduction and explanation of key concepts of Engineering Economics. The one-hour tutorial provides students with directed studies to enhance their self-learning capacities. Individual and group activities including discussions and presentations are conducted to facilitate students' understanding and application of the concepts they have learned to tackling real-life problems in Engineering Economics.

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th></tr>
<tr><td>Continuous Assessment</td><td>50%</td><td></td><td></td><td></td></tr>
<tr><td>1. In-class activities</td><td>15%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Written assignments</td><td>15%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Test</td><td>20%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Final Examination</td><td>50%</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
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To pass this subject, students are required to obtain Grade D or above in <u>both</u> the Continuous Assessment and Examination components.
</td></tr>
<tr><td>Student Study Effort Required</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>26 Hours</td></tr>
<tr><td>• Tutorial</td><td>13 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Study and self-learning</td><td>48 Hours</td></tr>
<tr><td>• Presentation preparation and written assignments</td><td>18 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>
Recommended Textbooks

1. Parkin and Bade, Foundations of Microeconomics, 8th ed., Pearson, 2018.
2. Sullivan, Wicks and Koelling, Engineering Economy, 16th ed., Pearson, 2014.

References

1. Drury, Colin, Management and Cost Accounting, 10th ed., Cengage Learning, 2018.
2. Robert H. Frank, The Economic Naturalist: Why Economics Explain Almost Everything?, Basic Books, 2007.
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<tr><td>Last Updated</td><td>July 2018</td></tr>
<tr><td>Prepared by</td><td>School of Accounting and Finance</td></tr>
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Subject Description Form

Subject Code	CBS3241P
Subject Title	Professional Communication in Chinese
Credit Value	2
Level	3
Pre-requisite / Co-requisite	Chinese LCR subjects (in Semester 2 of Year 3 or Semester 1 of Year 4)
Objectives	This subject aims to develop the language competence for professional communication in Chinese required by students to communicate effectively with various parties and stakeholders in regard to engineering-related project proposals and reports.
Intended Subject Learning Outcomes	**Upon completion of the subject, and in relation to effective communication with a variety of intended readers/audiences in Chinese, students will be able to:** 1. Plan, organise and produce professionally acceptable project proposals and reports with appropriate text structures and language for different intended readers 2. Plan, organise and deliver effective project-related oral presentations with appropriate interactive strategies and language for different intended audiences 3. Adjust the style of expression and interactive strategies in writing and speaking in accordance with different intended readers/audiences
Subject Synopsis/ Indicative Syllabus	1. Project proposals and reports in Chinese • Planning and organising project proposals and reports • Explaining the background, rationale, objectives, scope and significance of a project • Referring to the literature to substantiate project proposals • Describing the methods of study • Describing and discussing project results, including anticipated results and results of pilot study • Presenting the budget, schedule and/or method of evaluation • Writing executive summaries/abstracts 2. Oral presentations of projects • Selecting content for audience-focused presentations • Choosing language and style appropriate to the intended audience • Using appropriate transitions and maintaining coherence in team presentations • Using effective verbal and non-verbal interactive strategies
Teaching/Learning Methodology	<u>Learning and teaching approach</u> The subject is designed to develop the students' Chinese language skills, both oral and written, that students need to communicate effectively and professionally with a variety of stakeholders of engineering-related projects. It builds upon the language and communication skills covered in GUR language training subjects. The study approach is primarily seminar-based. Seminar activities include instructor input as well as individual and group work, involving drafting and evaluating texts, mini-presentations, discussions and simulations.

<table>
<tr><td></td><td>The learning and teaching activities in the subject will focus on a course-long project which will engage students in proposing and reporting on an engineering-related project to different intended readers/audiences. During the course, students will be involved in:

- planning and researching the project
- writing project-related documents such as project proposals and reports
- giving oral presentations to intended stakeholders of the project</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th></tr>
<tr><td>1. Project proposal in Chinese</td><td>60%</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>2. Oral presentation of project proposal</td><td>40%</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="3"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessments will arise from the course-long engineering-related project.
• Students will be assessed on written documents and oral presentations targeted at different intended readers/audiences. This facilitates assessment of students' ability to select content and use language and style appropriate to the purposes and intended readers/audiences.
• Students will collaborate in groups in planning, researching, discussing and giving oral presentations on the project. The written proposals will be individual work to ensure that students will be rigorously engaged in the application of language skills for the entire document.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Seminars</td><td>26 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Researching, planning, writing, and preparing the project</td><td>44 Hours</td></tr>
<tr><td>Total student study effort:</td><td>70 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Textbook:

1. 司有和 (1984) ：《科技寫作簡明教程》，安徽教育出版社。
2. 葉聖陶、呂叔湘、 朱德熙、 林燾 (1992)：《文章講評》 語文出版社。
3. 于成鯤主編（2003）：《現代應用文》，復旦大學出版社。
4. 岑紹基、謝錫金、祈永華 (2006) ：《應用文的語言·語境·語用》，香港教育圖書公司。
5. 邵敬敏主編 (2010) ：《現代漢語通論 (第二版)》，上海教育出版社。
6. 于成鯤、陳瑞端、秦扶一、金振邦主編 (2010)：《中國現代應用文寫作規範叢書：科教文與社交文書寫作規範》，復旦大學出版社。</td></tr>
</table>

	7. 香港特別行政區政府教育局·課程發展處中國語文教育組 (2012) ：《常用字字形表》，政府物流服務署印。
Last Updated	July 2016
Prepared by	CBS Department

Subject Description Form

Subject Code	COMP3512
Subject Title	Legal Aspects, Professionalism and Ethics of Computing
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	• To be fully aware of the basic set of legal, ethical and security responsibilities; • To introduce relevant professional bodies and be able to apply codes of conduct and ethical standards as a computing/IT practitioner; • To be in a position to deal with ethical dilemmas and legal challenges that they can expect to face when they start work.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Demonstrate an understanding of professional issues, including contemporary legislation, and ethical considerations, from the viewpoint of computing/IT professionals; 2. Apply the conceptual tools provided in the course to develop analytical skills for determining what to do in ethical and legal decision making Category B: Attributes for all-roundedness 3. Communicate effectively both verbally and in writing as a professional in computing/IT; 4. Learn independently for problem solving and solution seeking; 5. Think and reason critically, especially on different issues related to computing/IT professional in the society.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction A brief account of the development of computing/IT industry; exploration of computing technologies whose impact is likely to grow in the near future. 2. Computer ethics and profession Generic skills; typical scenarios of profession; characteristics of a profession; the system of professions; the computing profession; social issues. 3. Professional bodies and codes of ethics Role and functions of professional bodies; professional bodies for computing/IT practitioners; Impact of computing/IT professional bodies. 4. Methods and tools for ethical analysis Traditional/philosophical ethics; policy vacuum; social context; competing factors in decision making; practical approach/ analysis; sample cases. 5. Computer crimes and laws Computer criminals; computer fraud; computer sabotage; computer forensics. 6. Privacy Personal privacy; computer and privacy; relevant privacy acts. 7. Software ownership and intellectual property Ethical/legal issues of software; intellectual property; property rights; legal protection; philosophical basis; consequentialist argument.

<table>
<tr><td></td><td>8. <u>Security</u>
Fundamental concepts about security, Security at e-commerce, Security and legislation.
9. <u>Entrepreneurship</u>
Emerging technologies; entrepreneurship in computing profession; professional capabilities extended through virtual firms.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>This subject emphasizes both ethical and legal aspects of computing/IT professional. It is intended to provide students with knowledge and practical experience on ethical, technological and legal issues related to computing. Lectures would cover the conceptual aspects. Guest lectures with external speakers provide students with knowledge from another perspective. Laboratory and tutorial sessions focus on the exercises to gain understanding both of what being a professional in computing involves and how they can most effectively deal with the challenges they will encounter.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Continuous Assessment</td><td rowspan="5">100%</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Assignments</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Tests</td><td>✓</td><td>✓</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>• Projects</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Presentations</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr>
</table>
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>39 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Assignments, Quizzes, Projects, and Tests</td><td>66 Hours</td></tr>
<tr><td>Total student study effort</td><td>105 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Reference Books:

1. Herman T. Tavani, Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing, Hoboken, 3rd ed., N.J.: Wiley, 2011.
2. Deborah G. Johnson and Keith W. Miller, Computer Ethics: Analyzing Information Technology, 4th ed., Upper Saddle River, N.J.: Prentice Hall, 2009.
3. Tobias Kollmann, Andreas Kuckertz, Christoph Stèockmann, E-Entrepreneurship and ICT Ventures: Strategy, Organization and Technology, Hershey, PA: Business Science Reference, 2010.
4. Thomas N. Duening, Robert D. Hisrich, Michael A. Lechter, Technology Entrepreneurship: Creating, Capturing, and Protecting Value, Burlington, MA: Academic Press, 2010.</td></tr>
<tr><td>Last Updated</td><td>July 2016</td></tr>
<tr><td>Prepared by</td><td>COMP Department</td></tr>
</table>

Subject Description Form

Subject Code	EIE3101
Subject Title	Computer Animation
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This course aims at training students to master the basic principles, knowledge, and skills about computer animation. While pure theoretical discussion is avoided, this subject addresses practical issues and provides accessible techniques for straightforward implementations.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. describe the animation production pipeline 2. develop all the written and visual materials necessary for the production of computer animations 3. manage files and workflow needed in the animation production pipeline 4. discuss and implement dynamics simulations 5. discuss a variety of animation techniques and apply them to actual animation production Category B: Attributes for all-roundedness 6. understand the creative process when designing solutions to a problem
Subject Synopsis/ Indicative Syllabus	INTRODUCTION • The Production Process of Computer Animation MODELING • Modeling Concepts • Modeling Techniques RENDERING • The Camera • Lighting • Shading and Surface Characteristics ANIMATION AND EFFECTS • Computer Animation Techniques • Dynamics Simulations
Teaching/Learning Methodology	Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities. Tutorial, Laboratory and assignments: During tutorial/laboratory sessions, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.

	While lectures and tutorials will help to achieve the professional outcomes, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creativity in problem solving.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Continuous Assessment (total: 100%)							
• Homework and assignments	35%	✓	✓	✓	✓	✓	✓
• Tests	50%	✓	✓	✓	✓	✓	✓
• Laboratory exercises	15%		✓	✓	✓	✓	✓
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment, homework and laboratory exercises will require students to apply what they have learnt to solve problems. There will be open-ended questions that allow students to exercise their creativity in making design.

Tests: They assess students' achievement of the learning outcomes in a more formal manner.

Student Study Effort Expected		
	Class contact (time-tabled):	
	• Lecture/Tutorial	30 Hours
	• Laboratory	9 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Reference Book:

1. Kelly L. Murdock*, Autodesk 3ds Max 2017 Complete Reference Guide*, SDC Publications, 2016.
2. Rick Parent, *Autodesk 3ds Max 2017 for Beginners: A Tutorial Approach*, 17th ed., CADCIM Technologies, 2016.
3. Isaac Kerlow, *The art of 3D computer animation and effects*, 4th ed., Hoboken, N.J.: John Wiley & Sons, 2009.

Last Updated	July 2017
Prepared by	Dr Pauli Lai

Subject Description Form

Subject Code	EIE3103
Subject Title	Digital Signals and Systems
Credit Value	3
Level	3
Pre-requisite	AMA1103 Introductory Linear Algebra or AMA1120 Basic Mathematics II – Calculus and Liner Algebra and EIE2106 Signal and System Analysis
Co-requisite/ Exclusion	Nil
Objectives	1. To provide students with basic concepts and techniques for the modelling and analysis of discrete-time signals and systems. 2. To provide students with an analytical foundation for further studies in Communication Engineering and Digital Signal Processing.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the representations and classifications of digital signals and systems. 2. Understand the modelling of linear discrete-time systems. 3. Use different techniques to analyze and design discrete-time systems. 4. Apply software tools to laboratory exercises for experimenting with theories, and to the analysis and design of discrete-time systems. 5. Appreciate the advantages and disadvantages of using the different representations and modelling approaches. Category B: Attributes for all-roundedness 6. Present ideas and findings effectively.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Fourier Representations for Discrete-time Signals Mathematical Description of Discrete-Time Signals. Discrete Fourier Series. Discrete-Time Fourier Transform. Discrete Fourier Transform. Relationship Among Various Fourier Transforms. 2. Discrete-Time Systems Time-Domain Analysis of Discrete-Time Systems. Unit pulse response. Difference Equation Representation. Convolution. 3. System Analysis Frequency Response of LTI Discrete-Time Systems. Concept of Filtering: Lowpass, Bandpass and Highpass Filters. FIR Filters and IIR Filters. Linear and Circular Convolution. FIR Filter Analysis. Filtering Examples to Different Signals. 4. z-Transform Definition and Properties of z-Transform. Inverse z-Transform: Power Series Expansion, Partial-Fraction Expansion. z-Transfer Analysis of LTI Systems. 5. Filter design FIR filter design using windows, FIR design by frequency sampling, etc. **Laboratory Experiments:**

	1. Linear Time-Invariant Discrete-time Systems 2. Fourier Analysis of Discrete-time Signals 3. Convolution and Correlation 4. Application of Digital Filters
Teaching/ Learning Methodology	

Teaching and Learning Method	**Intended Subject Learning Outcome**	**Remarks**
Lectures	1, 2, 3, 5	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 3, 5	These are supplementary to lectures; Students will be able to clarify concepts and to gain a deeper understanding of the lecture material; Problems and application examples are given and discussed.
Laboratory sessions	4, 6	Students will make use of the software MATLAB and/or LabView to simulate various theories and visualize the results.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**					
		1	**2**	**3**	**4**	**5**	**6**
1. Continuous Assessment	50%						
• Laboratory sessions	14%				✓		✓
• Short quizzes	18%	✓	✓	✓		✓	
• Tests	18%	✓	✓	✓		✓	✓
2. Examination	50%	✓	✓	✓		✓	✓
Total	100%						

<table>
<tr><td></td><td colspan="2">Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

<table>
<tr><th>Specific Assessment Methods/Tasks</th><th>Remark</th></tr>
<tr><td>Short quizzes</td><td>These can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.</td></tr>
<tr><td>Tests and examination</td><td>End-of-chapter-type problems are used to evaluate the students' ability in applying concepts and skills learnt in the classroom;

Students need to think critically and to learn independently in order to come up with an alternative solution to an existing problem.</td></tr>
<tr><td>Laboratory sessions</td><td>Oral examination based on the laboratory exercises will be conducted to evaluate student's technical knowledge and communication skills.</td></tr>
</table>
</td></tr>
<tr><td rowspan="7">Student Study Effort Expected</td><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes</td><td>15 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">References:

1. M.J. Roberts, Fundamentals of Signals & Systems, McGraw-Hill, 2008.
2. James H. McClellan, Ronald W. Schafer and Mark A. Yoder, DSP First: A Multimedia Approach, Prentice-Hall, 1999.</td></tr>
<tr><td>Last Updated</td><td colspan="2">January 2018</td></tr>
<tr><td>Prepared by</td><td colspan="2">Dr Chris Chan</td></tr>
</table>

Subject Description Form

Subject Code	EIE3109
Subject Title	Mobile Systems and Application Development
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This course aims at providing students with an understanding of the real-time embedded and mobile systems, and the techniques essential to the design and implementation of mobile applications.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the structure of real-time operating systems for modern mobile computer systems. 2. Understand the programming techniques and tools for developing software that is run in modern mobile computer systems 3. Apply the knowledge to develop practical applications for modern real-time mobile computer systems. Category B: Attributes for all-roundedness 4. understand the creative process when designing solutions to a problem
Subject Synopsis/ Indicative Syllabus	1. Introduction Introduction to Embedded Systems – embedded real-time systems, embedded programming and program models, real-time operating system (RTOS). Introduction to Mobile Systems and Mobile Application Development – advancement of mobile devices, comparison of various mobile platforms (iOS, Android, Windows Phone, Blackberry, etc.), application design process. 2. iOS Application Development Introduction to iOS – system architecture, development environment (Xcode), MVC architecture. Introduction to Objective-C Programming – message passing, delegate pattern, retain/release. 3. Android Application Development Introduction to Android OS – development environment (Eclipse), Android application basic (activity, service, content provider, broadcast receiver, intent resolution). User Interface – layout overview, user interface widget, user interface event handling, user notification. Data Storage – shared preference, internal storage, external storage, SQLite, content provider. Networking – Android network overview and management, socket and HTTP, Wi-Fi and Bluetooth, GPS & telephony. Multimedia – voice recording, image capturing, basic drawing & animation.

<table>
<tr><td>Teaching/Learning Methodology</td><td>Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities.

Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures.

Laboratory and assignments: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.

While lectures and tutorials will help to achieve the professional outcomes, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creatively in problem solving.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Continuous Assessment (total: 50%)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Homework and assignments</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Tests</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>• Laboratory exercises</td><td>30%</td><td></td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment, homework and laboratory exercises will require students to apply what they have learnt to solve problems. There will be open-ended questions that allow students to exercise their creativity in making design.

Examination and tests: They assess students' achievement of the learning outcomes more rigorously.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes</td><td>15 hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
</table>
</td></tr>
</table>

Reading List and References	**Reference Books:** 1. Raj Kamai, *Embedded Systems: Architecture, Programming and Design*, 2nd ed., McGraw-Hill, 2009. 2. Jack Nutting, Fredrik Olsson, David Mark and Jeff LaMarche, *Beginning iOS 7 Development: Exploring the iOS SDK*, Apress, 2014. 3. Grant Allen, *Beginning Android 4*, Apress, 2012.
Last Updated	June 2015
Prepared by	Dr Ivan Ho

Subject Description Form

Subject Code	EIE3112
Subject Title	Database System
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	**To introduce:** 1. database design, development, and programming 2. advanced database queries and database security 3. data warehousing and data mining
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Database design, development, and programming 2. Advanced database queries and database security. 3. Data warehousing and data mining Category B: Attributes for all-roundedness 4. Communicate effectively
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Database Design and Development 1.1 DBMS systems; Client-server architecture; Database architectures and the web 1.2 SQL: data manipulation; data definition; 1.3 DB Development: DB applications and views; 1.4 Advanced SQL: SQL programming language; stored procedures; functions; triggers; cursors; exception handling 1.5 ER Modelling: ER diagrams; Transforming ER diagrams to relations 1.6 Normalization: Data redundancy and update anomalies; functional dependencies; normalization processes; normal forms 2. Managing Database Environments 2.1 Database Security: Database security best practices; SQL injection; Preventing SQL injection 3. Data Warehouse and Data Mining 3.1 Architectures of data warehouse; applications of data warehouse; data warehouse tools and technologies 3.2 Data warehouse queries; OLTP versus OLAP; 3.3 Data-mining processes; Data representation; 3.4 Classification, regression, and cluster Analysis **Laboratory Experiments** Lab 1: Database Implementation and SQL Lab 2: Advanced SQL Lab 3: Data Mining and Data Analysis

<table>
<tr><td>Teaching/Learning Methodology</td><td>Lectures: Fundamental principles and key concepts of the subject are delivered to students.

Tutorials: Students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed. Students will be given programming exercises and use database development tools to design database.

Laboratory Sessions: Students will do some programming exercises to enhance their understanding on database design and development.</td></tr>
<tr><td>Alignment of Assessment and Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Continuous Assessment (Total: 50%)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Short quizzes</td><td>5%</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Assignment</td><td>5%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Test</td><td>20%</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Laboratory</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Short quizzes: These can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.

Test & Examination: End-of-chapter-type problems are used to evaluate the students' ability in applying concepts and skills learnt in the classroom; students need to think critically and to learn independently in order to come up with an appropriate design.

Laboratory: Each student is required to produce a report; the accuracy and presentation of the report will be assessed.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture/Tutorial</td><td>30 Hours</td></tr>
<tr><td>• Laboratory/Practice Classes</td><td>9 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
</table>
</td></tr>
</table>

Reading List and References	1. Thomas Connolly and Carolyn Begg, *Database Systems: A Practical Approach to Design, Implementation, and Management*, 6/E, Pearson, 2015. 2. Mark L. Gillenson, *Fundamentals of database management systems, Wiley*, 2nd ed., Wiley, 2012. 3. I.H. Witten, *Data Mining: Practical Machine Learning Tools and Techniques*, 3rd ed., Morgan Kaufmann, 2011
Last Updated	September 2016
Prepared by	Dr Pauli Lai

Subject Description Form

Subject Code	EIE3320
Subject Title	Object-Oriented Design and Programming
Credit Value	3
Level	3
Pre-requisite	For 42470 and 42477: ENG2002 Computer Programming For 42375: EIE2264 Computer Programming
Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with the principles of object-oriented software design and programming from the perspective of Java implementation and UML. Students are expected to learn the concepts of and practical approaches to object-oriented analysis, design and programming using UML and Java.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the principles of object oriented design. 2. Apply Java in object oriented software development. 3. Apply UML in object oriented software modeling. 4. Apply object oriented approach to developing computer software. Category B: Attributes for all-roundedness 5. Learn independently and be able to search for the information required in solving problems. 6. Present ideas and findings effectively. 7. Think critically. 8. Work in a team and collaborate effectively with others.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to Software Engineering Software products; software processes; software process models; 2. Java Programming Basic Java technologies; Java platform; Java language basic: variables, operators, expressions, statements, blocks, control flow, methods, arrays. 3. Object-Oriented Programming with Java Objects and classes; class definition; fields, constructors and methods; object interaction; grouping objects; array and collections; designing classes; inheritance and polymorphism; managing inheritance: creating subclasses and super-classes, hiding member variables, overriding methods. Interfaces and packages. 4. Web Programming with Java *JavaScript:* Client-side Web programming; JavaScript and HTML; Object, events, and event handlers in JavaScript. *Java Servlets*: architecture of servlets, client interaction, life cycle of servlets, saving client states; servlet communications, session tracking, and using server resources. 5. Unified Modelling Language (UML) Purposes of modelling. Structural Modelling: classes, relationships, class Diagrams, interfaces, packages, and object diagrams. Behavioural

<table>
<tr><td></td><td>modelling interactions, use cases, use case diagrams, interaction diagrams, activity diagrams. Architectural modelling: components, deployment, and collaborations. Mapping UML diagrams to Java Code.

Laboratory Experiment:

1. <u>Laboratory Work</u>
Students will implement an on-line shopping system using Java Servlets and Tomcat Web server.

2. <u>Practical Work</u>
Students will be requested to use integrated development environment (IDE) to write and debug Java programs during tutorial and lab sessions.</td></tr>
<tr><td>Teaching/ Learning Methodology</td><td>
<table>
<tr><th>Teaching and Learning Method</th><th>Intended Subject Learning Outcome</th><th>Remarks</th></tr>
<tr><td>Lectures</td><td>1, 2, 3</td><td>fundamental principles and key concepts of the subject are delivered to students</td></tr>
<tr><td>MC Quizzes</td><td>1, 2, 3</td><td>students' knowledge on/understanding of certain topics can be easily estimated, and the corresponding teaching time will be adjusted accordingly</td></tr>
<tr><td>Tutorials</td><td>1,2,4,5,6</td><td>supplementary to lectures and are conducted with smaller class size;
students will be able to clarify concepts through developing simple Java programs.</td></tr>
<tr><td>Laboratory sessions</td><td>4,5,7</td><td>Students will need to design, develop, test, and document Java programs.</td></tr>
<tr><td>Mini-project</td><td>3,4,5,7,8</td><td>Students in groups of 2-3 are required to build a 3-tier online shopping software. They will also need to use UML to document their software.</td></tr>
</table>
</td></tr>
</table>

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)							
		1	2	3	4	5	6	7	8
1. Continuous Assessment (Total: 50%)									
• Assignments	8%		✓	✓	✓	✓		✓	
• Laboratory sessions	10%		✓		✓		✓	✓	✓
• Test	32%	✓							
2. Examination	50%	✓							
Total	100%								

The continuous assessment consists of a number of short quizzes, programming assignments, a mini-project, laboratory reports and a mid-term test.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	Multiple choices and true/false questions will be used to test and enhance students' understanding about the topics covered in lectures.
Assignments	Students will be asked to write Java programs and test the programs. They will also need to use UML diagram to illustrate the structure of their programs. Students will need to think critically and creatively in order to come up with a good solution for an existing problem.
Laboratory sessions and mini-project	Each group of students are required to produce a written report. Students will be accessed based on (1) the quality of their programs and (2) the clarity of their reports. Students will be asked to work as a team to develop a web application. Each of them will be responsible for part of the software.
Test and Exam	End-of-chapter problems will be used to evaluate students' ability in applying concepts and skills learnt in the classroom

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**
Reading List and References	**Textbooks:** 1. G. Booch, I. Jacobson and J. Rumbaugh, *The Unified Modeling Language User Guide*, 2nd ed., Addison-Wesley, 2005. 2. D.J. Barnes and M. Kolling, *Objects First with Java: A Practical Introduction using BlueJ*, 5th ed., Prentice-Hall, 2012. **Reference Books:** 1. H.M. Deitel and P.J. Deitel, *Java: How To Program (Early Objects)*, 10th ed., Prentice-Hall, 2014. 2. J. Lewis and W. Loftus, Java Software Solutions, 8th Edition, Pearson, 2015. 3. J. Rumbaugh, I. Jacobson and G. Booch, *The Unified Modeling Language Reference Manual*, 2nd ed., Addison-Wesley, 2004.	
Last Updated	February 2018	
Prepared by	Dr Lawrence Cheung	

Subject Description Form

Subject Code	EIE3333
Subject Title	Data and Computer Communications
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	1. To provide solid foundation to students about the architectures and operations of communication networks. 2. To enable students to master the knowledge about computer networking in the context of real-life applications. 3. To prepare students to learn and to critically evaluate new knowledge and emerging technology in communication networks.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the services, functions, and inter-relationship of different layers in communication network models 2. Describe how components in different layers inter-operate and analyze their performance. 3. Understand and apply the principles and practices of communication networks. 4. Learn new techniques and to align new technologies to existing network infrastructure. Category B: Attributes for all-roundedness 5. Present ideas and findings effectively. 6. Learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Computer Networks, Services, and Layered Architectures Evolution of networking and switching technology. Protocol and services. Layered network architectures: OSI 7-layer model, TCP/IP architecture. 2. Digital Transmission and Protocols in Data Link Layer Line coding techniques, error detection and correction. Automatic Repeat Request (ARQ) protocol and reliable data transfer service. Sliding-window flow control. Framing and point-to-point protocol, flow control and error controls. High level data link control (HDLC) protocol and point-to-point protocol (PPP). 3. Local Area Networks (LANs) and Wireless LANs Media Access Control (MAC) protocols: the IEEE802.3 Ethernet and IEEE802.11 wireless LAN standards. Interconnection of LANs: bridge, switch, and virtual LAN. 4. Network Layer Protocols Network layer operations, connection oriented and connectionless services. Internet protocol (IP): IP datagram format, IP addressing, subnetting, IP routing and router operations. Internet control message protocol (ICMP), dynamic host configuration protocol (DHCP), network address translation (NAT). 5. Transport Layer Protocols Transmission control protocol (TCP) and user datagram protocol (UDP)

Possible Laboratory Experiments:

1. Cisco router configuration and programming.
2. Static and Dynamic routing.
3. Network monitoring and analysis
4. Address resolution, ARP, IP, and TCP.

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3, 4	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 3, 4, 5	Supplementary to lectures. Students will be able to clarify concepts and to have a deeper understanding of the lecture material; Problems and application examples are given and discussed.
Laboratory sessions	5, 6	Students will conduct practical exercises to reinforce concepts and techniques learned.

Alignment of Assessment and Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Continuous Assessment	40%						
• Tests		✓	✓	✓	✓	✓	
• Assignments		✓	✓	✓	✓	✓	
• Laboratories				✓		✓	✓
2. Examination	60%	✓	✓	✓	✓	✓	
Total	100%						

The continuous assessment will consist of a number of assignments, laboratory reports, case study reports (administered in tutorial sessions), and two tests.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/ Tasks	Remark
Assignments, Tests and examination	These can measure the students' understanding of the theories and the concepts of the subject. End-of-chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; Assignments of reading report type to assess students' ability in acquiring new knowledge related to communication networks; Students need to think critically and creatively in order to come with an alternate solution for an existing problem.
Laboratory sessions	Each group of students is required to complete work-sheets, to indicate their understanding and correct completion of the laboratories. Accuracy and the presentation of the work-sheets will be assessed;

Student Study Effort Expected		
	Class contact (time-tabled):	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Textbook :

1. Behrouz A. Forouzan, *Data Communications & Networking,* 5th ed., McGraw-Hill, 2012.

Reference Books:

1. Behrouz A. Forouzan, *Computer Networks: A Top-Down Approach*, McGraw-Hill, 2012.
2. William Stallings, *Data and Computer Communications*, 9th ed., Pearson/ Prentice-Hall, 2012.
3. Douglas Comer, *Computer Networks and Internets*, 5th ed., Pearson/ Prentice-Hall, 2009.

Last Updated	December 2016
Prepared by	Dr K.T. Lo

Subject Description Form

Subject Code	EIE3343
Subject Title	Computer Systems Principles
Credit Value	3
Level	3
Pre-requisite	For 42477: EIE2105 Digital and Computer Systems For 42480: Nil
Co-requisite/ Exclusion	Nil
Objectives	This subject provides students with a broad treatment of the fundamentals of computer operating systems and the related system programming techniques.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the basic structure of a computer operating system. 2. Comprehend the basic concepts of file system and management, process control, scheduling and communication, as well as memory management. 3. Develop software programs to implement the abovementioned system functions. Category B: Attributes for all-roundedness 4. Understand the creative process when designing solutions to a problem.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** • Operating System Overview OS objectives and functions Modern operating systems Microsoft windows overview UNIX and LINUX • File System and Management File organization and access File directories File sharing Secondary storage management System programming for file, directory and I/O access • Process Description and Control Definition of process Process description Process control Process communication System programming for process control and communication • Threads and Scheduling Processes and threads Thread management and scheduling Thread synchronization System programming for thread management • Memory Management Memory management requirement

<table>
<tr><td></td><td>Memory partitioning
Paging
Segmentation
Dynamic Link Library (DLL)
System programming for memory management

• <u>Processor Scheduling</u>
Types of processor scheduling
Scheduling algorithms
Multiprocessor scheduling
Case study</td></tr>
<tr><td>Teaching/ Learning Methodology</td><td>
<table>
<tr><th>Teaching and Learning Method</th><th>Intended Subject Learning Outcome</th><th>Remarks</th></tr>
<tr><td>Lectures</td><td>1, 2, 3</td><td>Fundamental principles and key concepts of the subject are delivered to students.</td></tr>
<tr><td>Tutorials</td><td>1, 2, 3</td><td>Supplementary to lectures and are conducted with smaller class size;
students will be able to clarify concepts and to have a deeper understanding of the lecture material;
problems and application examples are given and discussed.</td></tr>
<tr><td>Laboratory sessions</td><td>1, 2, 3, 4</td><td>Students will make use of software tools to develop system programs in order to resolve different system problems.</td></tr>
<tr><td>Assignments</td><td>1, 2, 3</td><td>Through working assignment and end-of-chapter problems in text books, students will develop a firm understanding and comprehension of the knowledge taught.</td></tr>
</table>
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</table>

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)			
		1	2	3	4
1. Continuous Assessment	50%				
• Laboratory sessions	14%	✓	✓	✓	✓
• Quizzes	18%	✓	✓	✓	
• Tests	18%	✓	✓	✓	
2. Examination	50%	✓	✓	✓	
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Assignments, tests and examination	End-of-chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom;
Laboratory sessions	Each student is required to answer several questions related to each lab session in the lab sheet and hand in his/her answers. Students need to think critically and creatively in order to come with an alternate solution for an existing problem.

Student Study Effort Required		
	Class contact (time-tabled):	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or report writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Reference Books:

1. J. Hart, Windows System Programming, 4th ed., Addison-Wesley, 2010.
2. W. Stallings, *Operating Systems: Internals and Design Principles,* 7th ed., Prentice-Hall, 2011.
3. H.M. Deital, P.J. Deital, and D.R. Choffnes, *Operating Systems*, 3rd ed., Prentice-Hall, 2004.

Last Updated	January 2018
Prepared by	Dr C. Chan

Subject Description Form

Subject Code	EIE3360
Subject Title	Integrated Project
Credit Value	3
Level	3
Pre-requisite	ENG2002 Computer Programming
Co-requisite/ Exclusion	Nil
Objectives	At a mid-stage of the programme, this subject plays the role of applying knowledge acquired in other subjects in an integrated manner. While the emphasis will be placed on the technical challenges that may encompass system integration, software development and troubleshooting, students will also be given opportunities to face various non-technical difficulties behind the development of multimedia/information systems.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Design effective and reliable software programs to achieve the objectives of a project. 2. Critically evaluate the different alternatives and strategies when implementing a project. 3. Locate and resolve problems in a multimedia system and the related software. Category B: Attributes for all-roundedness 4. Search, self-learn and try untaught solutions. 5. Effectively use the limited resource and exercise discipline and time-planning to meet deadlines. 6. Present ideas and findings effectively. 7. Work in a team and collaborate effectively with others.
Subject Synopsis/ Indicative Syllabus	**Syllabus / Operation:** The project(s) shall be of software development in nature with defined milestones (or **Subtasks**). The scope to be covered will include multimedia and network system design, but does not exclude the possibilities of extending into areas such as computer animation or image processing. The project will not be close-ended in nature and will provide ample headroom for the more enthusiastic students to excel. Students will work in groups of two or three. Each **Subtask** will be given a certain period of time to complete. Progress will be measured by functional **Demonstrations**, and one or two written **Progress Reports**. Upon the completion of the project, each group will give a demonstration/presentation of the completed system and submit a **Final Report**. Students are required to individually keep a **Logbook** on the work performed during the entire period. The logbooks are to be evaluated and signed by the supervisor /assessor on a monthly or more frequent basis. At the end of the project, the logbooks will be collected and graded. **Lectures:** Lectures are to be conducted at the beginning of the semester. During these lectures, the instructor shall give clear explanation on the functional and technical requirements, with a schedule for submitting deliverables. Concepts specific to the project(s), which are not yet learnt by the students, are to be covered in these lectures. Concepts behind critical use of tools and equipment will also be strengthened. Copies of supplementary/reference material will be distributed, or, links to on-line material will be provided for self-paced learning.

Guided Laboratory Experiments:

The project will normally require the students to learn to use specific tools and/or equipment. Laboratory demonstrations and exercises will be arranged in the early weeks. Below are some examples:

1. Use of project-specific development tools, software and hardware.
2. Implementation of the basic framework of the project.
3. Software techniques to optimize the performance of the system.

Self-Paced Work:

Multiple sessions of laboratory will be scheduled to cater for self-paced work in the laboratory, particularly during the second half of the semester. To ensure the students are working in a correct direction, defined milestones are given in the course of their work. Students are required to demonstrate their works at each milestone to show their progress.

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3	Principles and key concepts of the multimedia platform used in the project are explained to students. Uses of tools are demonstrated. The goals are specified. The various problems to be encountered are explained.
Supervised Laboratory sessions	1, 2, 3	Students need to learn to use the provided software modules and expand them to accommodate new functionalities.
Extended self-paced laboratory work	1, 2, 3, 4, 5, 6, 7	Students will work in teams of two or three to construct a multimedia system. They need to learn to use the provided software modules and expand them to accommodate new functionalities.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)						
		1	2	3	4	5	6	7
Continuous assessment	100%							
• Lab reports		✓	✓	✓				
• Logbook & Reports		✓	✓	✓	✓	✓	✓	✓
• Progress and final demonstrations		✓	✓	✓	✓	✓	✓	✓
Total	100%							

Assessment on individual student's ability and contribution will be conducted, according to the attributes detailed below.

INSIGHT	as evidenced by how well the concepts are understood
CREATIVITY	as evidenced by ingenuity and imagination
WORKMANSHIP	as evidenced by how well ideas are implemented and how problems are resolved
DRIVE	as evidenced by initiative, diligence and tenacity
COMMUNICATION	as evidenced by an ability to express ideas clearly and succinctly
MANAGEMENT	as evidenced by how time, manpower and other resources are effectively used

At the completion of each subtask, team members will be asked to give a demonstration to the assessor. Based on the presentation and response to questions addressed to the members, the assessor will rate the contribution, achievement, and performance of each member. Other assessment items include lab reports, logbook, progress report, final demonstration, report and presentation.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	**Remark**
Lab reports	To measure the students' understanding of the theories and concepts as well as some practical issues in their subject materials
Progress and Final Demonstrations	Students need to think critically and creatively in order to come up with good alternate solution for an existing problem. Oral examination on the approach taken will be conducted for each group member to evaluate his contribution, technical knowledge and communication skills.
Logbook & Reports	Each group of students is required to produce one or two progress reports and a final report. Accuracy and the presentation of the reports will be assessed. Each group needs to explain in the reports the solutions they plan to use or have been used in the project. The reason behind of choosing such solutions should also be exemplified. The students also need to explain how the limited resources are used in the project and how the team members work together to achieve the project goal. Logbooks are assessed to evaluate contributions and the quality of records on the progress.

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	12 Hours
	• Laboratory	12 Hours
	• Mini-project / Meetings / presentation	15 Hours
	Other student study effort:	
	• Revision	12 Hours
	• Additional laboratory work	12 Hours
	• Mini-project Work / presentation / report writing	42 Hours
	Total student study effort:	**105 Hours**
Reading List and References	**Reference Books:** *To be specified by the subject lecturer for each project.*	
Last Updated	June 2015	
Prepared by	Dr Ivan Ho	

Subject Description Form

Subject Code	ELC3521
Subject Title	Professional Communication in English
Credit Value	2
Level	3
Pre-requisite / Co-requisite	English LCR subjects
Objectives	This subject aims to develop the language competence for professional communication in English required by students to communicate effectively with various parties and stakeholders in regard to engineering-related project proposals.
Intended Subject Learning Outcomes	**Upon completion of the subject, and in relation to effective communication with a variety of intended readers/audiences in English, students will be able to:** 1. Plan, organise and produce professionally acceptable project proposals with appropriate text structures and language for different intended readers 2. Plan, organise and deliver effective project-related oral presentations with appropriate interactive strategies and language for different intended audiences 3. Adjust the style of expression and interactive strategies in writing and speaking in accordance with different intended readers/audiences
Subject Synopsis / Indicative Syllabus	1. Project proposal in English • Planning and organising a project proposal • Explaining the background, rationale, objectives, scope and significance of a project • Referring to the current situation or existing literature to substantiate a project proposal • Describing the methods of study • Describing and discussing anticipated project results and (if applicable) results of a pilot study • Presenting the budget, schedule and (if applicable) method of evaluation • Writing an executive summary 2. Oral presentation of project proposal in English • Selecting content for an audience-focused presentation • Choosing language and style appropriate to the intended audience • Using appropriate transitions and maintaining coherence in a team presentation • Using effective verbal and non-verbal interactive strategies
Teaching/Learning Methodology	The subject is designed to develop the English language skills, both oral and written, that students need to use to communicate effectively and professionally with a variety of stakeholders of engineering-related projects. It builds upon the language and communication skills covered in GUR language training subjects. The study approach is primarily seminar-based. Seminar activities include instructor input as well as individual and group work, involving drafting and evaluating texts, mini-presentations, discussions and simulations. The learning and teaching activities in the subject will focus on a course-long project which will engage students in proposing and reporting on an

engineering-related project to different intended readers/audiences. During the course, students will be involved in:

- planning and researching the project
- writing project-related documents such as project proposals
- giving oral presentations to intended stakeholders of the project

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	**% Weighting**	**Intended subject learning outcomes to be assessed (Please tick as appropriate)**		
		1	**2**	**3**
1. Project proposal in English	40%	✓		✓
2. Oral presentation of project proposal in English	60%		✓	✓
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessments will arise from a course-long engineering-related project. Students will collaborate in groups in planning, researching, discussing and giving oral presentations on the project. They will be assessed on written documents and oral presentations targeted at different intended readers/audiences. This facilitates assessment of students' ability to select content and use language and style appropriate to the purposes and intended readers/audiences.

Assessment type	Intended readers/audience	Timing
1. Project proposal in English Each team writes a proposal of 2000-2500 words; and each member writes a report of 200-250 words explaining his/her contribution to the project	Mainly engineering experts	Week 8
2. Oral presentation of project proposal in English Each team delivers a speech (30 minutes for a team of four), simulating a presentation of the final proposal	Mainly non-experts	Weeks 12-13

Student Study Effort Expected	**Class contact:**	
	• Seminars	26 Hours
	Other student study effort:	
	• Researching, planning and writing the project • Rehearsing the presentation	52 Hours
	Total student study effort:	**78 Hours**
Reading List and References	1. D.F. Beer, (Ed.), *Writing and speaking in the technology professions: A practical guide*, 2nd ed., Hoboken, NJ: Wiley, 2003. 2. R. Johnson-Sheehan, *Writing proposals,* 2nd ed., New York: Pearson/Longman, 2008. 3. S. Kuiper, *Contemporary business report writing*, 3rd ed., Cincinnati, OH: Thomson/South-Western, 2007. 4. M.S. Lawrence, *Writing as a thinking process: Teacher's manual*. Ann Arbor, Mich: University of Michigan Press, 1975. 5. D.C. Reep, *Technical writing: Principles, strategies and readings*, 6th ed., Pearson, Longman, 2006.	
Last Updated	July 2018	
Prepared by	English Language Centre	

Subject Description Form

Subject Code	ENG3003
Subject Title	Engineering Management
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject provides students with: 1. A practical introduction to management and a comprehensive guide to the tools and techniques used in managing people and other resources. 2. Opportunities to trace the historical development and describe the functions of management, from planning, and decision making to organizing, staffing, leading, motivating, and controlling. It also includes a discussion on engineering ethics. 3. Opportunities to explore the core business strategy, technology, and innovation, and examine how these functions intertwine to play a central role in structural design, as well as supporting an organization's overall success.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** 1. Perform tasks in an organization related to organizing, planning, leading and controlling project and process activities; 2. Select appropriate management techniques for improving organizational structures, work procedures, and quality performance of operational tasks; 3. Analyze the factors that affect changes in the work environment, and be aware of the approaches in implementing change in an organization; 4. Be aware of the imperatives of ethical and business behaviors in engineering organizations in a fast-changing business environment.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. <u>Introduction</u> General management concepts in organizations; Functions and types of industrial organizations; Organizational structures; Corporate objectives, strategy, and policy 2. <u>Industrial Management</u> Roles of managers: Process of management, leadership, planning, organizing, motivating, and control of social and engineering activities; Quality management: Related tools and techniques 3. <u>Project Management</u> Project scope and objectives; Network analysis; Tools that support engineering operations and task scheduling 4. <u>Management of Change</u> Change leadership; Organizational change; Phases of planned change; Stress management; Factors that affect the execution of change 5. <u>Effects of Environmental Factors</u> The effects of extraneous factors on the operations of engineering organizations, such as ethics and corporate social responsibilities issues

<table>
<tr><td>Teaching/Learning Methodology</td><td>A mixture of lectures, tutorial exercises, and case studies are used to deliver various topics in this subject. Some topics are covered by problem-based format whenever applicable in enhancing the learning objectives. Other topics are covered by directed study so as to develop students' "life-long learning" ability.

The case studies, largely based on real experience, are designed to integrate the topics covered in the subject and to illustrate the ways various techniques are inter-related and applied in real life situations.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Coursework
• Group learning activities (10%)
• Presentation (individual) (30%)</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Final examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The coursework of this subject involves students working in groups to study cases that reflect the realities of management situations in an engineering setting. Through such exercises, students' ability to apply and synthesize acquired knowledge can be assessed on the basis of their performance in group discussion, oral presentations, and the quality of their written reports on these case studies. A written final examination is also designed to assess the intended learning outcomes.
</td></tr>
</table>

Student Study Effort Expected	**Class contact:**	
	• Lectures and review	27 Hours
	• Tutorials and presentations	12 Hours
	Other student study effort:	
	• Research and preparation	30 Hours
	• Report writing	10 Hours
	• Preparation for oral presentation and examination	37 Hours
	Total student study effort:	**116 Hours**
Reading List and References	1. John R. Schermerhorn, Jr., 2013, Introduction to Management, 12th ed., John Wiley 2. Robbins, S P, DeCenzo, D A, and Coulter, M, 2013, Fundamentals of Management Essential Concepts and Applications, 8th ed., Pearson 3. Morse, L C and Babcock, D L, 2010, Managing Engineering and Technology: an Introduction to Management for Engineers, 5th ed., Prentice Hall 4. White, M A and Bruton, G D, 2011, The Management of Technology and Innovation: A Strategic Approach, 2nd ed., South-Western Cengage Learning	
Last Updated	July 2016	
Prepared by	Faculty of Engineering	

Subject Description Form

Subject Code	SD3985
Subject Title	Computer Game Development
Credit Value	3
Level	3
Pre-requisite	ENG2002 Computer Programming
Co-requisite/ Exclusion	Nil
Objectives	• To provide a broad overview of fundamental elements and concepts in computer games design and development, and in their production process • To provide students with hands-on experience in designing and developing a computer game
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Design, analyze, implement and evaluate computer games 2. Appreciate computer games' designs and complexities 3. Demonstrate understanding of game production process through developing a computer game in a team starting from ideas 4. Demonstrate understanding of technical components in realizing a 2D game Category B: Attitudes of all-roundedness 5. Collaborate, organize and communicate with others in effective team work 6. Realize the interdisciplinary nature in computer games development and appreciate importance of collaboration 7. Be creative and critical to game and play design
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Game Design Overview History of computer games, types of computer games (video, console, arcade, hand-held, wireless, mobile); game genres; play mechanics; game rules; game progression; game balancing: obstacle/aid, penalties/rewards,; board game, role-playing game; interface design, information design, human-computer interaction design; integration of visual , audio, tactile and textual elements; visual design: composition, lighting and colour, graphics design; Audio design: music, sound effects; storytelling; game theory 2. Media and Tools Game arts; tools and standards of media: image and audio 3. Game Production Process Evaluating game concepts; game design documentation, storyboard, playtest; content creation, team roles, group dynamics, risk assessment; software engineering, project management; prototyping, iterative development; pre-production, production, testing 4. Game Programming Game loop; game engine architecture; event processing; state machine; physics and collision detection; networking

Teaching/ Learning Methodology

This subject will engage students by:

1. Lectures which introduce students with basic concepts in game design and essential elements in a game design document. Assignments are given to students for them to analyze essential elements in a simple game and write a game design document to describe the game.
2. Lectures which introduce basic technical components in 2D game programming, and laboratory sessions for them to implement these technical components in 2D game programming. Students are required to complete a number of tasks corresponding to these essential technical components in each lab, which serve as basis for students to realize their 2D games in their mini-project.
3. Students form a group to work on a mini-project to design and realize a playable game from ideas to demonstrate their understanding in the entire game production process.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Task	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**						
		1	**2**	**3**	**4**	**5**	**6**	**7**
Continuous Assessment								
• Written assignment	10%	✓	✓					
• Laboratory	35%				✓			
• Mini-project	55%	✓	✓	✓	✓	✓	✓	✓
Total	100%							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Written assignments are given to students for them to analyze essential elements of a computer game and to understand format of a game design document.

Laboratories are organized to let students to learn and practice basic technical components in realizing a 2D computer game. Each student is required to complete predefined tasks according to lab sheet for a number of laboratory sessions.

Students form groups of at most three members to work on a mini-project, in which each group creates a game starting from ideas till a playable game. During the project period, each group is required to submit assignments corresponding to different stage of the game development process. At the end of the project, each group is required to demonstrate their game and present their whole project to the class.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture/Tutorial	15 Hours
• Laboratory	24 Hours
Other student study effort:	
• Mini-project	65 Hours
• Assignment	6 Hours
Total student study effort:	**110 Hours**

Reading List and References	**Reference books:** 1. R. Koster, *A Theory of fun for game design.* O'Reilly, 2nd Edition, 2013. 2. K. Salen and E. Zimmerman, *Rules of Play: Game Design Fundamental*, 2004. 3. K. Oxland, *Gameplay and Design*, Addison-Wesley, 2004. 4. Crawford, *The Art of Computer Game Design*, 1982. Available from https://www.digitpress.com/library/books/book_art_of_computer_game_ design.pdf 5. H.M. Chandler, *The Game Production Handbook*, Infinity Science Press, 3rd edition, 2014. 6. F.D. Laramee, *Game Design Perspectives*, Charles River Media, 2002. 7. D. Saffer, *Designing for Interaction: Creating Smart Applications and Clever Devices,* News Riders, 2007. 8. J.S. Lewinski, *Developer's guide to Computer Game Design*, WordWare Publishing Inc, 2000. 9. A. Rollings and D. Morris, *Game Architecture and Design*, New Riders Publishing, 2004. 10. E. Bethke, *Game Development and Production*, WordWare Publishing Inc, 2003. 11. D. Michael, *The Indie Game Development Survival Guide*, Charles River Media, 2003.
Last Updated	July 2018
Prepared by	School of Design

Subject Description Form

Subject Code	COMP4342
Subject Title	Mobile Computing
Credit Value	3
Level	4
Pre-requisite	EIE3320 Object-Oriented Design and Programming and EIE3333 Data and Computer Communications or EIE3342 Computer Networks OR COMP2342 Operating Systems and COMP2411 Database Systems
Co-requisite/ Exclusion	Nil
Objectives	1. To learn about the concepts and principles of mobile computing; 2. To explore both theoretical and practical issues of mobile computing; 3. To develop skills of finding solutions and building software for mobile computing applications.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Grasp the concepts and features of mobile computing technologies and applications; 2. Have a good understanding of how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support; 3. Identify the important issues of developing mobile computing systems and applications; 4. Organize the functionalities and components of mobile computing systems into different layers and apply various techniques for realizing the functionalities; 5. Develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools; 6. Organize and manage software built for deployment and demonstration. Category B: Attributes for all-roundedness 7. Analyze requirements and solve problems using systematic planning and development approaches; 8. Search for and read critically the information required in solving problems; 9. Write and present technical survey papers in well-organized and logical manner; 10. Work in teams and collaborate with classmates.

Subject Synopsis/ Indicative Syllabus	**Topics:** 1. Overview of mobile computing Motivations, concepts, challenges, and applications of mobile computing; relationship with distributed computing, Internet computing, ubiquitous/pervasive computing; Mobile computing models and architectures. 2. Wireless networks Wireless communication concepts; classification of wireless networks: Cellar networks (1G, 2G, 3G, 4G), WLAN, WPAN, WMAN, Satellite networks. 3. Mobile device platforms Mobile devices; mobile OS; J2ME, Windows Mobile and .Net Framework, BREW. 4. Wireless Mobile Internet Wireless Internet architecture; Wireless gateway; Wireless application server; Synchronization server; Messaging server; Mobile Internet proxy services (transcoding, caching); Data dissemination; Disconnected operations (hording). 5. Mobile ad hoc networks Concepts and applications; routing in mobile ad hoc networks; sensor networks, mobile peer-to-peer computing. 6. Mobility management Handoff and location management concepts; mobility management in PLMN; mobility management in mobile Internet; mobility management in mobile agent systems; adaptive location management methods. 7. Location-based services LBS applications; mobile positioning techniques; GIS; LBS architecture and protocols. **Total:** 35 hours **Tutorials:** 7 hours **Labs:** 4 hours 1. WAP programming. (1 hour) 2. J2ME programming. (3 hours)
Teaching/Learning Methodology	The subject includes lectures, tutorials, and labs. During lectures, the fundamental concepts and principles of mobile computing together with the challenging issues in system design and application development will be introduced. Discussion on various topics related to mobile computing will also be conducted. The labs serve the purpose of training the students to apply the knowledge and technical skills learnt to develop applications, by using trendy programming platforms. Students are also encouraged to learn through self-study and team work.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)									
		1	2	3	4	5	6	7	8	9	10
1. Assignments	55%	✓	✓	✓					✓	✓	
2. Lab exercises						✓	✓				
3. Project					✓	✓	✓	✓	✓	✓	✓
4. Mid-term		✓	✓	✓				✓			
5. Examination	45%	✓	✓	✓	✓	✓		✓			
Total	100 %										

Assignments include individual an individual work on writing survey report and a group project on developing mobile computing applications. Together with the tutorial and lab sessions, they will be used to assess students' ability and skills to develop innovative applications and conduct survey on current trend of technology. Through group project, report writing and presentation skills will also be assessed. The mid-term and final exams are used to assess the students' understanding, critical thinking, and problem solving abilities.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture/Tutorial	39 Hours
Other student study effort:	
• Assignments, Reading, Exams	66 Hours
Total student study effort:	**105 Hours**

Reading List and References

Textbooks:
No particular textbook. Reference books and articles will be used.

Reference Books:
1. Martyn Mallick, *Mobile and Wireless Design Essentials*, Wiley Publishing, 2003.
2. Yu-Kwong Ricky Kwok, Vincent K.N. Lau, *Wireless Internet and Mobile Computing: Interoperability and Performance*, Wiley-IEEE Press, 2007. (Google Book)
3. D.P. Agrawal and Q.-A. Zeng, *Introduction to Wireless and Mobile Systems*, 2nd ed., Thomson Learning, 2006.
4. Reza B'Far, *Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML*, Cambridge University Press, 2005.
5. J. Schiller, *Mobile Communications*, 2nd ed., Pearson Education, 2003.

Last Updated: July 2016

Prepared by: COMP Department

Subject Description Form

Subject Code	COMP4422
Subject Title	Computer Graphics
Credit Value	3
Level	4
Pre-requisite	ENG2002 Computer Programming or COMP2011 Data Structures
Co-requisite/ Exclusion	Nil
Objectives	**The objectives of this subject are:** 1. To learn basic and fundamental computer graphics techniques; 2. To learn 3D image synthesis techniques; 3. To understand 3D modeling, design and visualization.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Gain proficiency in 3D computer graphics API programming; 2. Understand the interactive computer graphics architecture; 3. Possess in-depth knowledge of display systems, image synthesis, shape modeling, and interactive control of 3D computer graphics applications; 4. Enlarge their perspective of modern computer system with modeling, analysis and interpretation of 2D and 3D visual information. Category B: Attributes for all-roundedness 5. Understand, appreciate and follow the development and advancement of computer graphics technologies, including advanced technologies for 3D modelling, high performance rendering (life-long learning)
Subject Synopsis/ Indicative Syllabus	**Main topics covered:** 1. Basic introduction to human vision, displays, graphics pipeline 2. GPUs, CG Processing, frame buffers and APIs 3. 2D Modeling, primitives and rasterization 4. Polygon geometry 5. Geometric transformations 6. Two-dimensional viewing and clipping 7. Three-dimensional viewing and projections 8. Three-dimensional object representations 9. Visible surface detection 10. Illumination models 11. Shading models 12. Color models 13. Hierarchical modeling 14. Three-dimensional scene rendering **Laboratory Experiments:** Laboratory exercises will normally be conducted using the currently available computer graphics API such as OpenGL. The students will be exposed to basic frame-buffer control, pixel processes, rasterization, 2D drawings, 3D transformations, projections, scene hierarchy, modeling objects, color and interactive animation. **Case Study:** If applicable, case studies may be conducted on modeling and design systems that are used in commercial applications.

Teaching/ Learning Methodology

The teaching methodology is based on three main activities:

1. Lecture delivery
2. Interactive exchange with students in class
3. Laboratory exercises consisting of hands-on programming exercises and tests
4. Tutorial sessions in and/or outside the lecture and laboratory sessions
5. Exposition and training sessions on a commercial grade studio package
6. Sessions on 3D artistic design and special effects
7. Office hours questions, answers and clarification of material
8. Discussion sessions with optional additional workshops, lectures and labs

The learning methodology will be based on:

1. Lecture notes
2. Laboratory notes and programming exercises
3. Textbook material
4. Additional reference material
5. Web links to active tutorials and other presentation material

Group interactions and supervised discussion sessions.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**				
		1	**2**	**3**	**4**	**5**
1. Assignments	30%	✓	✓	✓		
2. Lab exercises		✓	✓	✓		
3. Project		✓	✓	✓	✓	✓
4. Mid-term	30%	✓	✓	✓		
5. Examination	40%	✓	✓	✓		
Total	100%					

The assignment weights will be effectively distributed amongst the intended subject learning outcomes to nurture creative thinking, independence, teamwork, technical skills and a global perspective towards the technological base of this subject. Specifically, the assignments and the lab exercises are selected to develop the technical skills and knowledge to solve problems in computing and software development as well as to realize effective solutions, understand, evaluate and develop a critical perspective in the development of both small and large systems and integration of systems. Critical thinking, effective communication and a demonstrable global outlook will be incorporated at every level of exercises and mid-term examinations. The final examination accounts for a global and comprehensive understanding of the entire subject material and serves as the final checkpoint for the learning outcomes against technical skills and critical problem solving with respect to all components of computer graphics and 3D modeling.

<table>
<tr><td rowspan="7">Student Study Effort Expected</td><td colspan="2">Class contact (time-tabled):</td></tr>
<tr><td>• Lecture</td><td>26 Hours</td></tr>
<tr><td>• Laboratory</td><td>13 Hours</td></tr>
<tr><td colspan="2">Other student study effort:</td></tr>
<tr><td>• Assignments</td><td>24 Hours</td></tr>
<tr><td>• Course work: reading, discussion, assignments</td><td>42 Hours</td></tr>
<tr><td colspan="2">Total student study effort:</td><td>105 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Textbooks:
1. D. Hearn, and M. Baker, Computer Graphics with OpenGL, 4th ed., Prentice-Hall, 2011.

Reference Books:
1. David Eck, Fundamentals of Computer Graphics with Java and OpenGL, http://math.hws.edu/graphicsnotes, 2010.
2. Peter Shirley and Steve Marschner, Fundamentals of Computer Graphics, 3rd ed., A.K. Peters, 2009.
3. E.S. Angel, Interactive Computer Graphics, A top-down approach with OpenGL, 2nd ed., Addison-Wesley, 2000.
4. E.S. Angel, OpenGL: A Primer, Addison-Wesley, 2000.
5. A. Watt, 3D Computer Graphics, 3rd ed., Addison-Wesley, 2000.
6. F.S. Jr. Hill, Computer Graphics Using Open GL, 2nd ed., Prentice-Hall, 2001.</td></tr>
<tr><td>Last Updated</td><td colspan="2">July 2016</td></tr>
<tr><td>Prepared by</td><td colspan="2">COMP Department</td></tr>
</table>

Subject Description Form

Subject Code	EIE4100
Subject Title	Computer Vision and Pattern Recognition
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	For 42477: EIE2106 Signal and System Analysis and EIE3103 Digital Signals and Systems
Objectives	1. To introduce students the fundamentals of image formation; 2. To introduce students the major ideas, methods, and techniques of computer vision and pattern recognition; 3. To develop an appreciation for various issues in the design of computer vision and object recognition systems; and 4. To provide the student with programming experience from implementing computer vision and object recognition applications.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Comprehend the fundamentals of image formation. 2. Comprehend the major ideas, methods, and techniques of image processing and computer vision. 3. Appreciate typical pattern recognition techniques for object recognition. 4. Implement basic image processing and computer vision techniques. 5. Develop simple object recognition systems. Category B: Attributes for all-roundedness 6. Present ideas and findings effectively. 7. Think critically. 8. Learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** • Image Formation and Image Models Radiometry; Sources, Shadows and Shading; Colour; Cameras. • Early Vision with One Image Linear Filters; Edge Detection; Texture; Digital Libraries. • Early Vision with Multiple Images The Geometry of Multiple Views; Stereopsis. • Mid-Level Vision Segmentation and Fitting; Tracking with Linear Dynamic Models. • High-Level Vision Correspondence and Pose; Registration in Medical Imaging Systems. • Finding Templates Using Classifiers Classifiers; Building Classifiers from Class Histograms; Feature Selection. • Category-Level Recognition Current Approaches to Object Recognition; Decision Trees; Nearest Neighbour Rule (NNR); Support Vector Machine; Artificial Neural Networks; Deep Learning.

Teaching/Learning Methodology

Lectures:
1. fundamental principles and key concepts of the subject are delivered to students;
2. guidance on further readings, applications and implementation is given.

Tutorials:
1. supplementary to lectures and are conducted with a smaller class size;
2. students will be able to clarify concepts and to have a deeper understanding of the lecture material;
3. problems and application examples are given and discussed

Laboratory sessions:
1. students will make use of the software tools to construct simple computer vision applications.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Continuous Assessment (total: 45%)									
• Tests	25%	✓	✓	✓					
• Assignments	10%	✓	✓	✓			✓	✓	✓
• Lab exercises and lab reports	10%		✓	✓	✓	✓	✓	✓	✓
2. Examination	55%	✓	✓	✓					
Total	100%								

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture	24 Hours
• Tutorial/Laboratory/Practice Classes	15 hours
Other student study effort:	
• Lecture: preview/review of notes; homework/assignments; preparation for test/quizzes/examination	36 Hours
• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
Total student study effort:	**105 Hours**

Reading List and References	**Recommended Textbook:** 1. D.A. Forsyth and J. Ponce, *Computer Vision: a Modern Approach,* Pearson, 2012. **Reference Books:** 1. M. Negnevitsky, *Artificial Intelligence: A Guide to Intelligent Systems*, 3rd Edition, Pearson/Addison Wesley, 2011. 2. C.M. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2006. 3. L.G. Shapiro and G. Stockman, *Computer Vision*, Prentice-Hall, 2001. 4. R. Schalkoff, *Pattern Recognition – Statistical, Structural & Neural Approaches*, John Wiley, 1992. 5. C.H. Chen and P.S.P. Wang (Editors), *Handbook of Pattern Recognition and Computer Vision*, World Scientific, 2005.
Last Updated	January 2018
Prepared by	Prof. Kenneth Lam and Dr Zheru Chi

Subject Description Form

Subject Code	EIE4102
Subject Title	IP Networks
Credit Value	3
Level	4
Pre-requisite	EIE3333 Data and Computer Communications or EIE3342 Computer Network
Co-requisite/ Exclusion	Nil
Objectives	1. Give a practical treatment on the design, implementation, and management of IP networks. 2. Introduce the variety of facilities, technologies, and communication systems to meet future needs of network services. 3. Evaluate critically the performance of existing and emerging global communication networking technologies.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Describe the operational and functional attributes of different components of IP networks. 2. Evaluate critically the design, implementation, and performance of IP networks with regard to different criteria. Category B: Attributes for all-roundedness 3. Think and evaluate critically. 4. Take up new technology for life-long learning. 5. Work in a team, and collaborate effectively with other members.
Subject Synopsis/ Indicative Syllabus	1. Basic Protocol Functions IP address, IP datagram structure, basic IP operations, delivery and forwarding IP packets 2. Protocols in TCP/IP ARP, RARP, ICMP, IGMP, UDP, TCP 3. Routing Protocols RIP, OSPF, BGP, Multicast Routing 4. Applications Over TCP/IP DNS, TELNET, FTP, Email, HTTP 5. Other Issues About IP IP over ATM, Mobile IP, Multimedia, Voice over IP, SIP, H.323, IPv6, IPSec Laboratory Experiments: 1. Voice over IP Experiment 2. IP Security
Teaching/Learning Methodology	Lecture/Tutorial: 39 hours Laboratory: 2 hours (Equivalent to 6 hours spent by students in laboratory)

<table>
<tr><td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Continuous Assessment (total: 40%)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Assignments</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Laboratory reports</td><td>10%</td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Tests</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="5"></td></tr>
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</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes</td><td>15 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>1. Behrouz A. Forouzan, TCP/IP Protocol Suite, 3rd ed., McGraw-Hill, 2006.</td></tr>
<tr><td>Last Updated</td><td>June 2015</td></tr>
<tr><td>Prepared by</td><td>Dr Lawrence Cheung</td></tr>
</table>

Subject Description Form

Subject Code	EIE4103
Subject Title	Mobile Computer System Architecture
Credit Value	3
Level	4
Pre-requisite	EIE2211 Logic Design or EIE2105 Digital and Computer Systems
Co-requisite/ Exclusion	Nil
Objectives	This course aims at providing students with an understanding of the hardware architecture of mobile computing systems and the techniques essential to their design and implementations.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the hardware architecture of mobile computers. 2. Understand the functions and features of different sub-systems of a mobile computer. 3. Understand the design constraints of mobile computer systems. Category B: Attributes for all-roundedness 4. understand the creative process when designing solutions to a problem
Subject Synopsis/ Indicative Syllabus	1. Mobile Computers and Their Applications Mobile computers and their applications in daily life. Complex systems and microprocessors. The embedded system design process. Formalisms for system design. 2. Instruction Sets ARM processor – Processor and memory organization, data operations, flow of control. TIC55x DSP – Processor and memory organization, data operations, flow of control. 3. Central Processing Units Programming input and output. Supervisor mode, exceptions, and traps. Co-processors. Memory system mechanisms. CPU performance. CPU power consumption. Design example. 4. Bus-Based Computer Systems The CPU bus. Memeory devices. I/O devices. Component interfacing. Designing with microprocessors. Development and debugging. System-level performance analysis. Design example. 5. Multiprocessors Why multiprocessors? CPUs and accelerators. Multiprocessor performance analysis. Consumer electronics architecture. Design examples: cell phones, compact DISC and DVD players, audio players, digital still cameras, video accelerator etc. 6. Networks Distributed embedded architectures. Networks for embedded systems. Network-based design. Internet-enabled systems. Vehicles as networks. Sensor networks. Design example.

<table>
<tr><td></td><td>7. <u>3D Graphics on Embedded Systems</u>
Principle of mobile 3D graphics system design. Mobile 3D graphics APIs. Mobile 3D graphics SoC. Real chip implementations.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities.

Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures.

Laboratory and assignments: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.

While lectures and tutorials will help to achieve the professional outcomes 1, 2, and 3, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creatively in problem solving.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1. Continuous Assessment (total: 50%)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Homework and assignments</td><td>16%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Tests</td><td>18%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>• Laboratory exercises</td><td>16%</td><td></td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment, homework and laboratory exercises will require students to apply what they have learnt to solve problems. There will be open-ended questions that allow students to exercise their creativity in making design.

Examination and tests: They assess students’ achievement of the learning outcomes more rigorously.</td></tr>
</table>

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**
Reading List and References	**Reference Book:** 1. W. Wolf, *Computers as components: Principles of embedded computing system design*, 2nd ed., Morgan Kaufmann, 2008. 2. J.H. Woo, J.H. Sohn, B.G. Nam and H.J. Yoo, *Mobile 3D graphics SoC: From algorithm to chip*, John Wiley & Sons, 2010.	
Last Updated	May 2018	
Prepared by	Dr Chris Chan	

Subject Description Form

Subject Code	EIE4104
Subject Title	Mobile Networking
Credit Value	3
Level	4
Pre-requisite	EIE3333 Data and Computer Communications or EIE3342 Computer Network
Co-requisite/ Exclusion	Nil
Objectives	1. Introduce the basic knowledge of mobile networks. 2. Introduce the variety of facilities, technologies, and communication systems to meet future needs of mobile network services. 3. Evaluate critically the performance of existing and emerging global mobile networking technologies.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Describe the operational and functional attributes of different components of mobile networks. 2. Evaluate critically the design, implementation, and performance of mobile networks with regard to different criteria. Category B: Attributes for all-roundedness 3. Think and evaluate critically. 4. Take up new technology for life-long learning. 5. Work in a team, and collaborate effectively with other members.
Subject Synopsis/ Indicative Syllabus	1. Mobile Communication Systems Handoff schemes, allocation of resources, routing, security 2. Existing Wireless Systems AMPS, GSM, PCS, 3G, GPS, TCP over Wireless 3. Ad Hoc and Sensor Networks Characteristics of Ad Hoc networks, Ad Hoc routing, characteristics of sensor networks, MAC protocol for wireless sensor networks 4. Wireless MANs, LANs, and PANs WMANs, WLANs, WPANs 5. Recent Advances Ultra-wideband technology, multicast in wireless networks, mobility (location) management, Bluetooth networks, threads and security issues Laboratory Experiments: 1. Computing efficiency and throughput of MAC protocols for wireless networks 2. Location determination of a mobile station

<table>
<tr><td>Teaching/Learning Methodology</td><td>Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities.

Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures.

Laboratory and assignments: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate the vulnerability of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.

While lectures and tutorials will help to achieve the professional outcomes, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creativity in problem solving.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td><td>
<table>
<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>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>1. Continuous Assessment (total: 40%)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Assignments</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>• Laboratory Reports</td><td>20%</td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Tests</td><td>10%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="5"></td></tr>
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</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>• Lecture</td><td>24 Hours</td></tr>
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<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination</td><td>36 Hours</td></tr>
<tr><td>• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing</td><td>30 Hours</td></tr>
<tr><td>Total student study effort:</td><td>105 Hours</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>1. D.P. Agrawal and Q. Zeng, Introduction to Wireless and Mobile Systems, 4th ed., Cengage Learning, 2016.</td></tr>
<tr><td>Last Updated</td><td>August 2017</td></tr>
<tr><td>Prepared by</td><td>Dr Ivan Ho</td></tr>
</table>

Subject Description Form

Subject Code	EIE4105
Subject Title	Multimodal Human Computer Interaction Technology
Credit Value	3
Level	4
Pre-requisite	EIE3312 Linear Systems or EIE3103 Digital Signals and Systems
Co-requisite/ Exclusion	Nil
Objectives	This course aims at providing students with a basic understanding of the theory and applications of multimodal human computer interaction (HCI) technologies.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the benefits of using multimodal HCI. 2. Understand the basic theories in statistical learning. 3. Have basic understanding of speech recognition, speaker recognition, handwriting recognition and face recognition. Category B: Attributes for all-roundedness 4. Understand the creative process when designing solutions to a problem.
Subject Synopsis/ Indicative Syllabus	1. Multimodal HCI Inputs and Their Applications Applications of multimodal HCI interfaces in daily life. Advantages of multimodal input interfaces. Understanding multimodal input behaviour. Trends in HCI technologies. 2. Fundamental of Statistical Learning Probability and random variables. Probability densities and distributions. Sampling distributions. Expectations and covariance. Bayes rule and Bayes decision theory. Curse of dimensionality. 3. Statistical Machine Learning for HCI Structure of pattern recognition systems. Unsupervised Learning: principal component analysis, K-means; Gaussian mixture models; hidden Markov models. Supervised Learning: linear regression; linear discriminant analysis; support vector machines. Deep Learning: deep neural networks (DNN); restricted Boltzmann machines; backpropagation. Applications to handwriting recognition. Applications to face recognition. Eigenface. Fisherface. 4. Speech Recognition and Its Applications Acoustic feature extraction. HMM for acoustic modelling. DNN for acoustic modelling. Language modelling. Applications: voice search, voice conversion, spoken dialog, speech emotion recognition 5. Speaker Recognition and Its Applications Acoustic features for speaker recognition. GMM-UBM systems. Factor analysis and I-vectors. Probabilistic linear discriminant analysis (PLDA). DNN for speaker recognition. Applications: biometric authentication; forensic.

Teaching/Learning Methodology

Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities.

Tutorials: During tutorials, students will work on/discuss some chosen topics. This will help strengthen the knowledge taught in lectures.

Laboratory and assignments: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems. The assignments will help students to review the knowledge taught in class.

While lectures and tutorials will help to achieve the professional outcomes, the open-ended questions in laboratory exercises and assignments will provide the chance to students to exercise their creatively in problem solving.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**			
		1	**2**	**3**	**4**
1. Continuous Assessment (total: 50%)					
• Homework and assignments	15%	✓	✓	✓	✓
• Tests and Quizzes	20%	✓	✓	✓	
• Laboratory exercises	15%			✓	✓
2. Examination	50%	✓	✓	✓	✓
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment, homework and laboratory exercises will require students to apply what they have learnt to solve problems. There will be open-ended questions that allow students to exercise their creativity in making design.

Examination and tests: They assess students' achievement of the learning outcomes in a more formal manner.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture	24 Hours
• Tutorial/Laboratory/Practice Classes	15 Hours
Other student study effort:	
• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
Total student study effort:	**105 Hours**

Reading List and References	**Reference Materials:** 1. S.Y. Kung, M.W. Mak and S.H. Lin, *Biometric Authentication: A Machine Learning Approach*, Prentice Hall, 2005. 2. Spoken Language Technology, *IEEE Signal Processing Magazine*, vol. 25, No. 3, May 2008. 3. C.M. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2006. 4. J.P. Thiran, F. Marques and H. Bourlard, *Multimodal Signal Processing, Theory and Applications for Human Computer Interaction*, Elsevier, 2010. 5. S.B. Wan and M.W. Mak, *Machine Learning for Protein Subcellular Localization Prediction*, De Gruyter, 2015. 6. M.W. Mak, "Lecture Notes on Factor Analysis and I-Vectors", *Technical Report and Lecture Note Series, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University*, Feb. 2016. 7. M.W. Mak, "Lecture Notes on Backpropagation", *Technical Report and Lecture Note Series, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University*, July 2015.
Last Updated	March 2016
Prepared by	Dr M.W. Mak

Subject Description Form

Subject Code	EIE4106
Subject Title	Network Management and Security
Credit Value	3
Level	4
Pre-requisite	EIE3333 Data and Computer Communication or EIE3342 Computer Network
Co-requisite/ Exclusion	Nil
Objectives	This course aims at training students to master the basic principles, knowledge, and skills about network management and network security. They will learn how to apply these principles in various scenarios by using appropriate hardware and software tools to design solutions for network management and security problems, and to evaluating performance.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Describe some common features about network management systems 2. Perform basic network management tasks with appropriate tools 3. Describe some network security services and functions 4. Analyze and evaluate some common security features of computer networks 5. Design simple network management and security systems Category B: Attributes for all-roundedness 6. Communicate Effectively 7. Understand the creative process when designing a solution to a problem
Subject Synopsis/ Indicative Syllabus	1. Network Management Functional areas in network management, network management station, agent, management information base (MIB), Simple Network Management Protocol (SNMP) 2. Network Security Security services and mechanisms, basic cryptography, authentication protocols, digital signature and public key infrastructure, firewall and virtual private network (VPN)
Teaching/Learning Methodology	Lectures: The subject matters will be delivered through lectures. Students will be engaged in the lectures through Q&A, discussions and specially designed classroom activities. Tutorials: During tutorials, students will work on/discuss some chosen topics in small group. This will help strengthen the knowledge taught in lectures. Laboratory: During laboratory exercises, students will perform hands-on tasks to practice what they have learned. They will evaluate performance of systems and design solutions to problems.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)						
		1	2	3	4	5	6	7
1. Continuous Assessment (total: 50%)								
• Homework and assignments	15%	✓		✓	✓	✓	✓	✓
• Tests	20%	✓		✓	✓		✓	
• Laboratory exercises	15%		✓			✓		✓
2. Examination	50%	✓		✓	✓	✓	✓	✓
Total	100%							

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Assignment and homework will require students to apply what they have learnt to solve problems. They will be asked to evaluate the security features of a system, to design a system to meet network management and security requirements.

Laboratory exercises: Students will be assessed about their performance on hands-on tasks such as setting up a VPN, capturing and analyzing packets, setting up a network management system.

Tests will require the students to solve network management and security problems within a specific time and without access to other materials. This is a good way to assess students' mastery of knowledge and understanding.

Examination: This is similar to tests but in a larger scale. It can assess students' achievement of the learning outcomes in a wider spectrum.

Student Study Effort Expected

Class contact (time-tabled):	
• Lecture	24 Hours
• Tutorial/Laboratory/Practice Classes	15 Hours
Other student study effort:	
• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
Total student study effort:	**105 Hours**

Reading List and References	**Text Book:** 1. Perez, Andre, *Network Security*, London: Hoboken, NJ: ISTE; Wiley 2014 (eBook, online access) 2. Subramanian, Mani, *Network management : principles and practice*, Pearson, 2nd ed., 2011 (PolyU Library Acc. No.: TK5105.5 .S92 2011). 3. *Network security, administration, and management advancing technology and practice*, InfoSci-Books. ; MyiLibrary, Information Science Reference, 2011 (eBook, online access). 4. Behrouz A. Forouzan, *Introduction to cryptography and network security*, New York: McGraw-Hill Higher Education, 2008 (PolyU Library Acc. No.: TK5105.59 .F672 2008). **General References and standards:** 1. Ding, Jianguo, *Advances in network management*, Books24x7, CRC Press : Auerbach Publications, 2010 (eBook, online access). 2. Clemm, Alexander, *Network Management Fundamentals*, Indianapolis, Ind.: Cisco Press, 2007 (PolyU Library Call Number: TK5105.5 .C576 2007) 3. Yusuf Bhaiji, *Network security technologies and solutions*, Indianapolis, IN: Cisco Press, 2008 (PolyU Library Call Number: TK5105.59 .B468 2008). 4. James Henry Carmouche, *IPsec virtual private network fundamentals*, Indianapolis, Ind.: Cisco Press, 2007 (PolyU Library Call Number: TK5105.567 .C37 2007). **Classics Paper** 1. Shannon, Claude Elwood, *Claude Elwood Shannon: collected papers*, Institute of Electrical and Electronics Engineers, c1993 (PolyU Library Call Number: TK5101 .S448 1993).
Last Updated	June 2016
Prepared by	Dr C.K. Leung

Subject Description Form

Subject Code	EIE4108
Subject Title	Distributed Systems and Cloud Computing
Credit Value	3
Level	4
Pre-requisite	EIE3320 Object Oriented Design and Programming
Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with the principles of distributed systems and cloud computing. It enables students to master the development skills for providing and constructing distributed services on the Web and cloud. Through a series of lab exercises, students will be able to develop interoperable and distributed Web and cloud applications.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the concepts of distributed systems, cloud computing, and big data 2. Identify the key components in distributed systems, cloud services, and big data analytics 3. Build distributed systems. 4. Understand the advantages and limitations of different distributed system and cloud architectures. 5. Understand the enabling technologies for building distributed systems. 6. Understand the different components of distributed systems. 7. Set up and configure a distributed application. Category B: Attributes for all-roundedness 8. Think critically. 9. Learn independently. 10. Work in a team and collaborate effectively with others. 11. Present ideas and findings effectively.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to Distributed Systems and Cloud Computing 1.1. Definition and examples of distributed systems; 1.2. Technologies for Network-Based Systems: multi-core and multi-threading; virtual machines; 1.3. Distributed and Cloud Computing Models: client-server; clusters; grids; peer-to-peer 2. Enabling Technologies for Building Distributed Systems 2.1. Socket Programming: datagram sockets; stream-mode sockets 2.2. Remote Method Invocation 2.3. Extensible Markup Language (XML): XML markup; XML namespaces; XML schema 3. Service-Oriented Architecture for Distributed Computing 3.1. Service and Service-Oriented Architectures 3.2. Web Services: simple object access protocol (SOAP); building web services with SOAP; web services description language (WSDL); role of WSDL in Web services; remote web-services invocation using WSDL; Web service implementation 3.3. RESTful Web Services: architectural principles of REST; REST vs. SOAP; AJAX; RESTful implementation; JAX-RS

4. Cloud Platform Architecture and Programming Environments
   4.1. Service Models: public clouds; private clouds; hybrid clouds
   4.2. Data Centres
   4.3. Virtualization: level of virtualization; hardware virtualization; server and storage consolidation;
   4.4. Layer and Types of Clouds: IaaS; PaaS; SaaS
   4.5. Cloud Programming Environments: Google App Engine;

5. Big Data Analytics
   5.1. Introduction to Big Data: big data use cases; source of big data
   5.2. Storing Big Data: unstructured databases; NoSQL; CAP theorem; key-value stores; document stores
   5.3. Distributed Computing with MapReduce: map and reduce tasks
   5.4. Hadoop: Hadoop clusters; Hadoop distributed file systems; implementation examples

Programming Exercises and Laboratory Experiments:

1. Multi-Threading
2. Socket Programming
3. Remote Method Invocation (RMI)
4. Web Services

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1,2,4,5,6	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1,3,4,5,6,8,9	Supplementary to lectures and are conducted with smaller class size; Students will be able to clarify concepts and to have a deeper understanding of the lecture material; Programming exercises will be provided to strengthen students' hands-on experiences.
Laboratory sessions	3,6,7,8,10, 11	Students will go through the development process of various distributed systems and evaluate their performance.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/ Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)										
		1	2	3	4	5	6	7	8	9	10	11
1. Continuous Assessment	40%											
• Short quizzes	3%	✓	✓		✓	✓	✓					
• Assignments	10%	✓	✓		✓	✓	✓		✓	✓		
• Tests	17%	✓	✓		✓	✓	✓		✓	✓		
• Laboratory sessions, mini-project	10%			✓			✓	✓	✓		✓	✓
2. Examination	60%	✓	✓		✓	✓	✓		✓	✓		
Total	100 %											

The continuous assessment consists of assignments, laboratory reports and tests.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	Short multiple choice quizzes are conducted to measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.
Assignments, tests and examination	Assignments are of two types: (1) short essays on different types of distributed systems and (2) programming exercises demonstrating the operating principles of different distributed systems. The purposes are to strengthen students' understanding on the topics they learnt in classes. Students will be accessed based on their ability in applying concepts and skills learnt in the classroom. Students need to think critically and creatively in order to come with an alternate solution for an existing problem. Test and examinations are given to students to assess their competence level of knowledge and comprehension and their ability to apply knowledge and skills in new situations. The criteria (i.e. what to be demonstrated) and level (i.e. the extent) of achievement will be graded according to six levels: Excellent (A+ and A), Good (B+ and B), Satisfactory (C+ and C), Marginal (D) and Failure (F). These will be made known to the students before an assignment/homework is given. Feedback about their performance will be given promptly to students to help them improvement their learning.
Laboratory sessions and lab reports	Students are required to build two to three distributed systems and web services during the lab sessions. They are also required to write reports to explain the architecture and operating principle of their systems. Students will be accessed based on (1) their ability to apply knowledge that they learn in classes to build distributed systems and (2) their ability to write a clear report that explains the principle of operation and architecture of the systems that they have created.

Student Study Effort Expected		
	Class contact (time-tabled):	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References	**Reference Books:** 1. M.P. Papazoglou, *Web Services and SOA: Principles and Technology*, 2nd Edition, Prentice-Hall, 2013. 2. G. Coulouris, *Distributed Systems: Concepts and Design*, 5th ed., Addison-Wesley, 2011. 3. A.S. Tanenbaum and M. Van Steen, *Distributed Systems: Principles and Paradigms*, Prentice-Hall, 2007. 4. T. Erl, *Cloud Computing: Concepts, Technology and Architecture*, Prentice-Hall, 2013. 5. V. Mayer-Schönberger and K. Cukier, Big Data: A Revolution That Will Transform How We Live, Work, and Think, John Murray Pub., 2013. 6. T. White, "Hadoop: The Definitive Guide", O'Reilly, 3rd Ed. 2012
Last Updated	February 2018
Prepared by	Dr M.W. Mak

Subject Description Form

Subject Code	EIE4428
Subject Title	Multimedia Communications
Credit Value	3
Level	4
Pre-requisite	EIE3333 Data and Computer Communications or EIE3342 Computer Networks
Co-requisite/ Exclusion	Nil
Objectives	To study the technical issues and system solutions for providing multimedia communications on the Internet.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the current state-of-the-art developments in Internet technologies for multimedia communications. 2. Appreciate the principles used in designing multimedia protocols, and so understand why standard protocols are designed the way that they are. 3. Understand the system design principles of multimedia communications systems. 4. Solve problems and design simple networked multimedia systems. Category B: Attributes for all-roundedness 5. Think critically and learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Terminal/Codec Support for Multimedia Communications Scalable Coding: SNR Scalability, Spatial Scalability, Temporal Scalability and Fine Granularity Scalability (FGS) Error Control: Error Propagation, Error Resilience Coding Techniques Rate Control: Concepts for Rate Control, MPEG TM5 Rate Control Algorithms 2. Transport Layer Support for Multimedia Communications TCP congestion control, TCP Delay Analysis, TCP Throughput Analysis, Bandwidth Allocation. Media transport protocols: Real Time Protocol (RTP) and Real Time Control Protocol (RTCP); Signalling Protocols: Real-Time Streaming Protocol (RTSP) 3. Quality of Services (QoS) Integrated services (intserv): Architecture and Service Model, Resource Reservation Protocol (RSVP), Packet Scheduling Disciplines in the Internet Differentiated Services (diffserv): Framework and Concept, Assured and Expedited Services, Packet Classification, Routers Internals and Packet Dropping Techniques 4. Multimedia Streaming Systems Streaming architecture: Real-time Streaming and On-demand Streaming, Content Delivery Network (CDN), Data Sharing Techniques, Support of Interactive Operations, Peer-to-Peer (P2P) video streaming techniques, Case Studies on Video on Demand and IPTV

Laboratory Experiments/Miniprojects:

1. Multimedia networking
2. Multimedia streaming

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3	fundamental principles and key concepts of the subject are delivered to students
Tutorials	1, 2, 3, 4, 5	supplementary to lectures and are conducted with smaller class size; students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed
Laboratory sessions/Mini-projects	4, 5	students will make use of network simulators to simulate various types of communication networks and evaluate their performance, or students will develop a simple multimedia streaming system by integrating different components together using some existing tools.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Continuous Assessment (total 40%)						
• Assignments	4%	✓	✓	✓		✓
• Tests	24%	✓	✓	✓	✓	✓
• Mini-Project	12%				✓	✓
2. Examination	60%	✓	✓	✓	✓	✓
Total	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	mainly objective tests (e.g., multiple-choice questions, true-false, and matching items) conducted to measure the students' ability to remember facts and figures as well as their comprehension of subject materials
Assignments, tests and examination	end-of chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; students need to think critically and creatively in order to come with an alternate solution for an existing problem
Laboratory sessions / miniprojects	each group of students are required to produce a written report; accuracy and the presentation of the report will be assessed.

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**
Reading List and References	**Reference Books:** 1. J.K. Kurose, *Computer Networking: A Top-down Approach Featuring the Internet*, 6th ed., Pearson, 2012. 2. Ze-Nian Li and Mark S. Drew and J. Liu, *Fundamentals of Multimedia*, Springer, 2nd Edition, 2014. 3. K.R. Rao, Z.S. Bojkovic and D.A. Milovanovic*, Multimedia Communication Systems: Techniques, Standards, and Networks,* Prentice-Hall PTR, 2002.	
Last Updated	June 2015	
Prepared by	Dr K.T. Lo	

Subject Description Form

Subject Code	EIE4430
Subject Title	Honours Project
Credit Value	6
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	Students will be most benefited from doing projects in order to have the chance to practise hands-on application of the knowledge the student has learned through the curriculum, while producing something useful or valuable. On this ground, the Honours Project (also called Final-Year Project or FYP in short) component in the curriculum is designed that meets the following objectives: 1. To provide the opportunity to the students to apply what they have learned in previous stages in a real-life technological problem 2. To enable the student to acquire and practise project management skills and discipline on pursuing the Honours Project 3. To enable the student to apply knowledge in internet and multimedia technologies to analyse problems and synthesize solutions while considering various practical constraints.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** <u>Category A: Professional/academic knowledge and skills</u> 1. Understand the background, requirements, objectives, and deliverables to be produced for the specific project 2. Apply knowledge and skills relevant to internet and multimedia technologies to achieve the objectives of the project. 3. Learn to use new tools and facilities, and to gather new information, for the conduction of the project <u>Category B: Attributes for all-roundedness</u> 4. Work under the guidance of a supervisor while exercising self-discipline to manage the project 5. Communicate effectively with related parties (supervisor, peers, vendors, etc.) 6. Work collaboratively with others (team-partners, outsource company, technical support staff, etc.) 7. Realize different constraints, and to make appropriate compromise, when creatively designing the solution to a technical problem.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** The progression of the project will consist of the following stages: <u>Project Specification</u> In this stage, the student will work in conjunction with the project supervisor to draw up a concrete project plan specifying at least the following: 1. Background of the project 2. Aims and objectives 3. Deliverables 4. Methodology to be adopted 5. Schedule <u>Project Execution</u> The project will be pursued so that the objectives are to be met; the deliverables

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are to be produced in accordance with the schedule. The student and the project supervisor will meet constantly to discuss the progress. In particular the following should be demonstrated:

1. Adherence to the schedule
2. Achievement of objectives by the student's work
3. Initiatives of the student to work, design, and to solve problems
4. Inquisitiveness of the student (e.g. to probe into different phenomena or to try different approaches)
5. Diligence of the student to spend sufficient effort on the project
6. Systematic documentation of data, design, results, etc. during the process of working out the project

<u>Project Report</u>
It is important that the student is competent in disseminating the results for others to review. Through this dissemination process, project achievements can be communicated, experience can be shared, and knowledge and skills learned can be retained and transferred. The following elements will be important as evidence of achievement:

1. Project log book (documenting the work done over the year)
2. Project report (hardcopy and softcopy)
3. Presentation
4. Performance in a Question-and-Answer session
5. Demonstration
</td>
</tr>
<tr>
<td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td>
<td>
<table>
<tr><th rowspan="2">Specific Assessment Methods/ Task</th><th rowspan="2">% Weighting</th><th colspan="7">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td>Continuous Assessment</td><td>100%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="7"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

<table>
<tr><th>Specific Assessment Methods/Tasks</th><th>Remark</th></tr>
<tr><td>Continuous assessment</td><td>The assessment of the project work is done continuously throughout the whole project period. The evidence of the student's achievement will be documented in the log book and reports submitted in various stages. The student will be required to give a presentation and demonstration so that he/she can communicate with other parties about the project achievement.</td></tr>
</table>
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</table>

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Structured study	52 Hours
	• Meeting with project supervisor (1 hours per week)	26 Hours
	Other student study effort:	
	• Project development and guided study	102 Hours
	• Reports writing, preparing for presentation and demonstration	30 Hours
	Total student study effort:	**210 Hours**
Reading List and References	**Reference Books:** *To be specified by the project supervisor for each project.*	
Last Updated	June 2015	
Prepared by	Dr Frank Leung	

Subject Description Form

Subject Code	EIE4431
Subject Title	Digital Video Production and Broadcasting
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject provides a broad knowledge of digital video production and broadcasting.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the fundamentals of digital video systems with emphasis on production and broadcasting. 2. Work with digital video editing tools. 3. Understand the system design principles of video broadcasting. 4. Design simple systems related to video broadcasting. 5. Facilitate for further development in advanced digital video production and broadcasting. Category B: Attributes for all-roundedness. 6. Learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to Video Production and Broadcasting Elements of a video production and broadcasting system. Video services in Hong Kong. Video production and broadcasting standards and current development. 2. Fundamental of Video Production Production process, pre-production, production and post-production. Digital video editing. 3. Video Production and Recording Equipments Digital camera and video camera, video cassette recorder (VCR), digital video recorder, storage media, VCD, DVD-video. Video player: DVD player and advanced digital video player with full VCR support. 4. Analog Video Broadcasting Standards Component video and composite video, NTSC, and PAL. 5. Fundamental of Digital Video Broadcasting Digital video coding standards, Video transport layer, and transmission layer. 6. Video Transport Layer MPEG-2 systems and multiplexing, programme specific information and service information. 7. Error Control for Digital Video Quality of service requirements for video communications. Error resilience and concealment techniques for digital video. Transport protocols for multimedia communications. Video streaming over the Internet. 8. Digital Video Broadcasting Techniques and Standards Channel coding for error control in digital TV, Digital modulation technique

and conditional access for digital TV.

Laboratory Experiments:

1. Basic video editing tools
2. Digital video editing – visual effects
3. Digital video editing – Layering and keying clips

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 3, 4, 5, 6	fundamental principles and key concepts of the subject are delivered to students
Tutorials	1, 3, 4, 5, 6	supplementary to lectures and are conducted with smaller class size; students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed
Laboratory sessions	2, 6	students will make use of digital video editing tools

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)					
		1	2	3	4	5	6
1. Continuous Assessment (total 40%)							
• Short quizzes/ Assignments	10%	✓		✓	✓	✓	✓
• Tests	20%	✓		✓	✓	✓	✓
• Laboratory sessions	10%		✓				✓
2. Examination	60%	✓		✓	✓	✓	✓
Total	100%						

The continuous assessment will consist of laboratory reports, a number of short quizzes, assignments, and tests.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	mainly objective tests (e.g., multiple-choice questions, true-false, and matching items) conducted to measure the students' ability to remember facts and figures as well as their comprehension of subject materials
Assignments, tests and examination	end-of chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; students need to think critically and creatively in order to come with an alternate solution for an existing problem
Laboratory sessions	each group of students are required to produce a written report; accuracy and the presentation of the report will be assessed; oral examination based on the laboratory exercises will be conducted for each group member to evaluate his technical knowledge and communication skills

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**
Reading List and References	**Reference Books:** 1. U. Reimers, *DVB: The Family of International Standards for Digital Video Broadcasting*, Springer, 2005. 2. Richard Brice, *Newnes Guide to Digital TV*, Newnes, 2003. 3. Gerald Millerson, *Television Production*, Focal Press, 2001.	
Last Updated	March 2014	
Prepared by	Dr Y.L. Chan	

Subject Description Form

Subject Code	EIE4432
Subject Title	Web Systems and Technologies
Credit Value	3
Level	4
Pre-requisite	ENG2003 Information Technology
Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with the principles and practical programming skills of developing Internet and Web applications. It enables students to master the development skill for both client-side and server-side programming, especially for database applications. Students will have opportunity to put into practice the concepts through programming exercises based on various components of client/server web programming.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the enabling technologies for building Internet and Web database applications. 2. Understand the different components for developing client/server applications. 3. Apply the techniques and features of the client/server development languages to construct a database application based on Internet. 4. Develop the web database applications through programming exercises. Category B: Attributes for all-roundedness 5. Present ideas and findings effectively. 6. Think critically. 7. Learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction to Client/Server Computing The basic principles of client/server computing; Distinguished characteristics of client/server systems and application areas; Comparison of two tier versus three tier client/server solutions; Web programming model; Interactive web. 2. Web Programming Client-Side Web Programming: Benefits and limitation of client-side web programming. Basic concepts and development based on Java applet / JavaScript / dynamic HTML (DHTML). Server-Side Web Programming: Approaches to server-side programming. Benefits and limitations of server-side web programming. Development framework for server-side programming based on PHP / Servlet / JSP. Web application development. Development of a web application using synchronous and asynchronous techniques 3. Web Database Database Design and Implementation: Relation model; Mapping an ER model to relational model; Foundations of relational implementation; Structured query language.

Web Database Applications: Multi-tier architecture; Principle of web database applications: store, manage and retrieve data.

4. Data Analysis
Introduction to data mining; Concepts of data analysis; web data mining; Introduction to big data analysis; Techniques of big data analysis.

Laboratory Experiments:

Practical Works:
1. Client-side web application programming.
2. Server-side web application programming.
3. Database-driven web design.
4. Web database Applications.

Teaching/ Learning Methodology

Teaching and Learning Method	**Intended Subject Learning Outcome**	**Remarks**
Lectures	1, 2, 6	fundamental principles and key concepts of the subject are delivered to students.
Tutorials	1, 2, 6	supplementary to lectures; students will be able to clarify concepts and to have a deeper understanding of the lecture material; problems and application examples are given and discussed.
Laboratory sessions	3, 4, 6, 7	students will develop client-side and server-side web applications.
Mini-project	3, 4, 5, 6, 7	students in groups of 2/3 are required to develop a database-driven web application. Each group is required to perform a detailed study and make a presentation.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	**% Weighting**	**Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)**						
		1	**2**	**3**	**4**	**5**	**6**	**7**
1. Continuous Assessment (total 60%)								
• Tests	18%	✓	✓	✓	✓		✓	
• Quiz	18%	✓	✓	✓	✓		✓	
• Laboratory sessions	6%			✓	✓		✓	✓
• Mini-project	18%	✓	✓	✓	✓	✓	✓	✓
2. Examination	40%	✓	✓	✓	✓		✓	
Total	100%							

The continuous assessment consists of tests, laboratory exercises and a mini-project.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Tests and examination	end-of chapter type problems used to evaluate students' ability in applying concepts and skills learnt in the classroom; students need to think critically and creatively in order to come with an alternate solution for an existing problem.
Laboratory sessions, mini-project	oral examination based on the laboratory exercises will be conducted to evaluate student's technical knowledge and communication skills.

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Reference Books:

1. Max Bramer, *Web Programming with PHP and MySQL: A Practical Guide*, Springer, 2015.
2. O'Kane, Mike, *A Web-based Introduction to Programming: Essential Algorithms, Syntax, and Control Structures using PHP, HTML and MySQL*, 3rd ed., Caroline Academic Press, 2014.
3. Nixon, Robin, *PHP: 20 Lessons to Successful Web Development*, McGraw-Hill Education, 2015.

Last Updated	March 2018
Prepared by	Dr Bonnie Law

Subject Description Form

Subject Code	EIE4435
Subject Title	Image and Audio Processing
Credit Value	3
Level	4
Pre-requisite	EIE3312 Linear Systems or EIE3103 Digital Signals and Systems
Co-requisite/ Exclusion	Nil
Objectives	To provide a broad treatment of the fundamentals in image and audio processing.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Category A: Professional/academic knowledge and skills 1. Understand the fundamentals of image and audio signal processing and associated techniques. 2. Understand how to solve practical problems with some basic image and audio signal processing techniques. 3. Have the ability to design simple systems for realizing some multimedia applications with some basic image and audio signal processing techniques. Category B: Attributes for all-roundedness 4. Present ideas and findings effectively. 5. Learn independently.
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Image processing 1.1 Fundamentals of digital image: Digital image representation and visual perception, image sampling and quantization. 1.2 Image enhancement: Histogram processing; Median filtering; Low-pass filtering; High-pass filtering; Spatial filtering; Linear interpolation, Zooming. 1.3 Image coding and compression techniques: Scalar and vector quantizations; Codeword assignment; Entropy coding; Transform image coding; Wavelet coding; Codec examples. 1.4 Image analysis and segmentation: Feature extraction; Histogram; Edge detection; Thresholding. 1.5 Image representation and description: Boundary descriptor; Chaincode; Fourier descriptor; Skeletonizing; Texture descriptor; Moments. 2. Audio processing 2.1 Fundamentals of digital audio: Sampling; Dithering; Quantization; psychoacoustic model. 2.2 Basic digital audio processing techniques: Anti-aliasing filtering; Oversampling; Analog-to-digital conversion; Dithering; Noise shaping; Digital-to-analog Conversion; Equalisation. 2.3 Digital Audio compression: Critical bands; threshold of hearing; Amplitude masking; Temporal masking; Waveform coding; Perceptual coding; Coding techniques: Subband coding and Transform coding. 2.4 Case Study of Audio System/Codecs: MP3; MP3-Pro; CD; MD; DVD-Audio; AC-3; Dolby digital; Surround; SRS Surround system; Digital Audio Broadcasting, etc.

Laboratory Experiments:

1. Image processing techniques
2. Image compression
3. Audio compression
4. Psychoacoustic behaviour

Teaching/ Learning Methodology

Teaching and Learning Method	Intended Subject Learning Outcome	Remarks
Lectures	1, 2, 3	Fundamental principles and key concepts of the subject are delivered to students.
Tutorials	2, 3, 5	These are supplementary to lectures and are conducted with smaller class sizes; students will be able to clarify concepts and to gain a deeper understanding of the lecture material; problems and application examples are given and discussed.
Laboratory sessions	4, 5	Students will make use of software to simulate the various theories and visualize the results.

Assessment Methods in Alignment with Intended Subject Learning Outcomes

Specific Assessment Methods/Tasks	% Weighting	Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)				
		1	2	3	4	5
1. Continuous Assessment	40%					
• Short quizzes	10%	✓	✓	✓		
• Tests	16%	✓	✓	✓		
• Laboratory sessions	14%	✓			✓	✓
2. Examination	60%	✓	✓	✓	✓	✓
Total	100 %					

The continuous assessment will consist of a number of assignments, laboratory reports, and two tests.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Specific Assessment Methods/Tasks	Remark
Short quizzes	These can measure the students' understanding of the theories and concepts as well as their comprehension of subject materials.
Assignments, tests and examination	End-of chapter type problems are used to evaluate the students' ability in applying concepts and skills learnt in the classroom; students need to think critically and to learn independently in order to come up with an alternative solution to an existing problem.
Laboratory sessions	Students are required to conduct some laboratory works, and produce the written reports; The accuracy and presentation of the report will be assessed; the emphasis is on assessing the students' ability to apply knowledge and skills learned in lectures, and their ability to relate the taken data and results to the most relevant theory.

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture	24 Hours
	• Tutorial/Laboratory/Practice Classes	15 Hours
	Other student study effort:	
	• Lecture: preview/review of notes; homework/assignment; preparation for test/quizzes/examination	36 Hours
	• Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing	30 Hours
	Total student study effort:	**105 Hours**

Reading List and References

Textbooks:

1. R.C. Gonzalez and R.E. Woods, *Digital Image Processing*, 2nd ed., Prentice-Hall, 2002.
2. Ken C. Pohlmann, *Principles of Digital Audio*, 4th ed., McGraw-Hill, 2000.

Reference Books:

1. Ze-Nian Li and Mark S. Drew, *Fundamentals of Multimedia*, Pearson Prentice-Hall, 2004.
2. M. Mandal*, Multimedia Signals and Systems,* Kluwer Academic Publishers, 2003.

Last Updated	January 2018
Prepared by	Dr Chris Chan

Subject Description Form

Subject Code	SD4981
Subject Title	Computer Game Development Project
Credit Value	6
Level	4
Pre-requisite	SD3985 Computer Game Development
Co-requisite/ Exclusion	Nil
Objectives	1. To introduce students with fundamental concepts and algorithms in developing 3D computer game. 2. To provide students with hands-on experience in designing, implementing and evaluating 3D computer game.
Intended Subject Learning Outcomes	**Upon completion of the subject, students will be able to:** Professional/academic knowledge and skills 1. Identify essential building blocks in 3D computer games 2. Understand, analyze, implement and evaluate algorithms in developing 3D computer games 3. Realize trends in real-time algorithms in advanced 3D computer games 4. Explore new algorithms for future 3D computer games 5. Demonstrate understanding of game production process through developing a 3D computer game in a team starting from ideas Attitudes of all-roundedness 6. Collaborate, organize and communicate with others in effective team work 7. Realize the interdisciplinary nature in 3D computer games development and appreciate importance of collaboration 8. Be creative and critical to game and play design
Subject Synopsis/ Indicative Syllabus	**Syllabus:** 1. Introduction Game production pipeline, 3D game engine, architecture and components. 2. Graphics and Rendering Graphics rendering pipeline; 3D hardware: programmable graphics pipeline, shading languages, procedural shading, lighting, effects; scene management; visibility processing, resource management; 3D modelling, skeleton, texturing and materials, animation; digital content creation tools 3. Audio 3D and multi-channel audio; modelling for effects, echo. 4. Physics Physics basic concepts; kinematics, kinetics, dynamics; Newton's laws, mass, moment of inertia, friction, force; constrained motion; particle systems; physics engine 5. Artificial intelligence Path planning; agent architecture; decision-making systems; genre-specific AI (FPS, RTS, RPG, racing and sport AI), behavioural modelling, artificial life. 6. Network Multiplayer game architecture, networking, protocols, topologies, security, database; online game systems.

<table>
<tr><td></td><td>Laboratory Experiment:
3D modelling software, using different modules in game engine</td></tr>
<tr><td>Teaching/ Learning Methodology</td><td>

Lectures which introduce basic technical components in 3D game programming, including architecture of 3D game engine, and algorithms and trends in their future developments. Students are required to study a new algorithm and study its implications in 3D game design and development.
Students are required to complete a number of tasks corresponding to those essential technical components in laboratory sessions, which serve as basis for students to realize their 3D games in their mini-project.
Students form a group to work on a project to design, implement and evaluate a playable game from ideas to demonstrate their understanding in the entire game production process.

</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Subject Learning Outcomes</td><td>
<table>
<tr><th rowspan="2">Specific Assessment Methods/ Task</th><th rowspan="2">% Weighting</th><th colspan="8">Intended Subject Learning Outcomes to be Assessed (Please tick as appropriate)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr>
<tr><td>Continuous Assessment</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Written Assignment</td><td>5%</td><td></td><td></td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Laboratory</td><td>15%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>• Project</td><td>80%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="8"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Written assignment is given to students for them to study new algorithms in 3D computer game and understand their implications in 3D game design and development.

Laboratories are organized to let students to learn and practice basic technical components in a 3D game engine for realizing a 3D game. Each student is required to complete a predefined task according to a lab sheet for each laboratory session. There are also advanced tasks which require them to explore associated knowledge and techniques.

Students form groups of at most three members to work on a mini-project, in which each group creates an original playable game from idea, and evaluate with intended players. During the project period, each group is required to submit assignments corresponding to different stage of the game development process. At the end of the project, each group is required to demonstrate their game and present their whole project to the class.
</td></tr>
</table>

Student Study Effort Expected	**Class contact (time-tabled):**	
	• Lecture/Tutorial	30 Hours
	• Laboratory	48 Hours
	Other student study effort:	
	• Project	136 Hours
	• Assignment	6 Hours
	Total student study effort:	**220 Hours**
Reading List and References	**Reference Books:** 1. T. Moller, *Real-Time Rendering,* A.K. Peters, *3rd editio*n, 2008. 2. J.D. Foley, *Computer Graphics: Principles and Practice*, Addison-Wesley, 3rd edition, 2014. 3. Watt, *3D Games: Real-time Rendering and Software Technology*, Addison-Wesley, 2001. 4. J. Gregory. *Game Engine Architecture,* CRC Press, *2nd edition*, 2014. 5. R. Parent, *Computer Animation: Algorithms and Techniques,* Morgan Kaufmann, *3rd edition*, 2012. 6. D.H. Eberly, *Game Physics,* Elsevier, *2nd edition,* 2010 7. M. Haigh-Hutchinson, Real-time Cameras: A guide for game designers and developers. Morgan Kaufman, 2009. 8. I. Milington, J.D. Funge, Artificial Intelligence for games, Morgan Kaufmann/Elsevier, 2nd edition, 2009. 9. K.C. Finney, 3D game programming all in one, Course Technology PTR, 3rd edition, 2013. 10. J. Darby, Wizards and Warriors: Massively Multiplayer Online Game Creation, Cengage Learning, 2012. 11. B. Schwab, AI game engine programming, Course Technology, 2nd edition, 2009.	
Last Updated	July 2018	
Prepared by	School of Design	

Different types of GPA, and their calculation methods

Types of GPA	Purpose	Rules for GPA calculation
GPA	Determine Progression/ Graduation	(1) All academic subjects taken by the student throughout his study, both inside and outside the programme curriculum, are included in the GPA calculation. (2) IC training subjects will be included in the GPA calculation while WIE/Sandwich Training will not. (3) For retake subjects, only the last attempt will be taken in the GPA calculation. (4) Level weighting, if any, will be ignored.
Semester GPA	Determine Progression	Similar to the rules for GPA as described above, except that only subjects taken in that Semester, including retaken subjects, will be included in the calculation.
Weighted GPA	To give an interim indication on the likely Award GPA	(1) Similar to the rules for GPA, except that only subjects inside the programme curriculum concerned will be included in the calculation. Subjects outside the programme curriculum will be excluded. (2) Only academic subjects will be counted towards the Weighted GPA. (3) For retake subjects, only the last attempt will be taken in the Weighted GPA calculation. (4) A weighting of 2 for Level 1 and 2 subjects, and a weighting of 3 for Level 3, 4 and 5 subjects, will be included in the calculation to determine the Honours classifications. (5) The weighted GPA will be the same as the Award GPA unless a student has taken more subjects than required.

Types of GPA	Purpose	Rules for GPA calculation
Major/Minor GPA	For reference and determination of award classification	*Major/Minor GPA* (1) Only subjects inside the curriculum of the Major/Minor Programmes will be taken in the Major/ Minor GPA calculation. (2) Only academic subjects will be counted towards the Major/Minor GPA. (3) For retake subjects, only the last attempt will be taken in the Major/Minor GPA calculation. (4) Up to 6 credits from the Major/GUR [including Language Communication Requirements (LCR) subjects at proficiency level] can be counted towards the chosen Minor. Nevertheless, students must take at least 6 credits from their chosen Minor programme in order to satisfy the residential requirement of their chosen Minor. In addition, to be eligible for the Major and Minor awards, the total number of credits taken by the students for their Major-Minor studies must not be lower than the credit requirement of the single discipline Major programme. *Major GPA* (5) Level weighting will only be included in the calculation for weighted assessment scheme. *Minor GPA* (6) Level weighting will <u>not</u> be included in the calculation of Minor GPA.
Award GPA	For determination of award classification	If the student has not taken more subjects than required, the Award GPA will be as follows: (1) For programmes with level weightings: Award GPA = Weighted GPA (2) For Major/Minor programmes: Award GPA = Major GPA

University Graduation Requirements for 4-year Full-time Undergraduate Degree Programmes Offered from 2018/19 Onward

All candidates qualifying for a 4-year Full-time Undergraduate Degree offered from 2018/19 onward must meet:

1. the University Graduation Requirements, and
2. the specific graduation requirements of their chosen programme of study.

The minimum University Graduation Requirements are explained in the sections below. For the graduation requirements of specific programmes of study (Majors and Minors), candidates should refer to the relevant section of the Definitive Programme Document or consult the programme-offering Departments concerned.

Summary of University Graduation Requirements for Normal Year 1 Intake

To be eligible for a PolyU Bachelor's Degree under the 4-year full-time undergraduate curriculum, a student must:

1. Complete successfully a minimum of 120 credits[1] .
2. Earn a cumulative GPA of 2.00 or above at graduation.
3. Complete successfully the mandatory Work-Integrated Education (WIE) component as specified by their programme/Major.
4. Satisfy the following requirements in general education:

(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[3]	Non-credit bearing
	Total = 30 credits

Summary of University Graduation Requirements for Senior Year Intake

Area and Credit Requirement	**Curriculum Requirement**
Cluster-Area Requirements (CAR) [not more than 6 credits; min. 3 credits should be in subject designated as "China-related"]	• Students should not take more than 3 credits (normally 1 subject) from the same cluster area. • Students need to fulfill the English and Chinese reading and writing requirements and 3 credits of China Studies requirement (CSR). • Students may apply for a waiver if they have fulfilled the English and Chinese reading and writing requirements and/or CSR requirement in their previous studies.

[1] This minimum only applies to Normal Year 1 Intake. Also, for passing a subject which is designed to fulfil the credit requirement of different types of subject, students will be regarded as having fulfilled the credit requirements of the particular types of subject concerned. Nevertheless, the subject itself will only be counted once in the student's total credit requirements, and the students will be required to make up the total credit requirement by taking another subject.

[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.

[3] Students admitted to the programmes as Senior Year Intakes are not required to take the Healthy Lifestyle Programme. Advanced Standing students are required to take HLS (except for those who are HD/AD holders who follow the Senior Year/Articulation Degree programme GUR curriculum).

Area and Credit Requirement	Curriculum Requirement
Service Learning [3 credits]	-

No further credit transfer will be given to the required GUR unless the student is admitted on qualification more advanced than Associate Degree/Higher Diploma [4] and had also completed comparable components in their earlier studies.

Regarding Language and Communication Requirements (LCR), this is normally not required. Only those students not meeting the equivalent standard of the Undergraduate Degree LCR (based on their previous studies in AD/HD programmes and their academic performance) will be required to take degree LCR subjects on top of the normal curriculum requirement. The Programme offering department will refer to the guidelines provided by the Language Centres (ELC and CBS) to determine whether a new student has met the equivalent standard. 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.

(a) 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 A**). 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).

Students entering the University with specified attainment grades in certain public examinations can be given credit transfer or exemption for one or both LCR English subjects.

Table A: English LCR subjects (each 3 credits)

English language competence level/ Subject	***Practical English for University Studies***	***English for University Studies***	**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 B: Proficient level elective subjects for DSE Level 4 students and above (or equivalent) (each 3 credits)

LCR Proficient level elective subjects	Advanced English for University Studies
	Advanced English Reading and Writing Skills
	English in Literature and Film
	Persuasive Communication

(The above framework will also apply to students on articulation degree programmes, Senior Year curriculum and Higher Diploma programmes, where applicable.)

[4] The admission of students to UGC-funded Articulation Degree programmes and Senior Year intakes on the basis of qualification(s) more advanced than Associate Degree/Higher Diploma is subject to the conditions stipulated by UGC governing the UGC-funded Senior Year places.

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 C**).

Table C: Chinese LCR subjects

Categories of students	Required subject
For Chinese speaking students	A Chinese LCR subject
For non-Chinese speakers or students whose Chinese standards are at junior secondary level or below	One subject from **Table D** 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)	• For non-Chinese speaking students; and • Students who have completed Chinese I or equivalent
Chinese III (for non-Chinese speaking students)	• 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)	• 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

Students who have obtained verified qualifications or certain results in some public examinations [e.g. HKDSE, HKALE, JEE, GSAT(Taiwan)] should be granted exemption for the Chinese LCR subject. (Conditions for the exemption will be worked out in due course.)

(The above framework and exemption arrangements will also apply to students on articulation degree programmes, Senior Year curriculum and Higher Diploma programmes, where applicable.)

Writing Requirement in CAR Subjects

In additional to the LCR in English and Chinese explained above, all students must also, among the Cluster Areas Requirement (CAR) subjects they take (see section (e) below), pass one subject that includes the requirement for a substantial piece of writing in English and one subject with the requirement for a substantial piece of writing in Chinese.

Reading Requirement in CAR Subjects

All students must, among the CAR subjects they take, pass one subject that includes the requirement for the reading of an extensive text in English and one subject with the requirement for the reading of an extensive text in Chinese.

A list of approved CAR subjects for meeting the Writing Requirement (with a "W" designation) and for meeting the Reading Requirement (with an "R" designation) is shown at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

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.

Note: In addition to the LCR and Reading and Writing Requirements, students also have to complete 4 credits of discipline-specific language requirements (2 credits in English and 2 credits in Chinese) as specified in the curriculum requirements of their Major.

(b) Freshman Seminar

All students must successfully complete, normally in their first year of study, one 3-credit Freshman Seminar offered by their chosen Broad Discipline. The purpose is to (i) introduce students to their chosen discipline and enthuse them about their Major study, (ii) foster students' creativity, problem-solving ability and global outlook, (iii) give students an exposure to the concepts and an understanding of their discipline-based professional career development with the incorporation of entrepreneurship, and (iv) engage students, in their first year of study, in desirable forms of university learning that are conducive to smooth adjustment to University life, self-regulation, and autonomous learning.

A list of Freshman Seminars offered by the Broad Disciplines can be found at:
https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

(c) Leadership and Intra-Personal Development

All students must successfully complete one 3-credit subject in the area of Leadership and Intra-Personal Development, which is designed to enable students to (i) understand and integrate theories, research and concepts on the qualities (particularly intra-personal and interpersonal qualities) of effective leaders in the Chinese context, (ii) develop greater self-awareness and a better understanding of oneself, (iii) acquire interpersonal skills essential for functioning as an effective leader, (iv) develop self-reflection skills in their learning, and (v) recognise the importance of the active pursuit of knowledge on an intra-personal and interpersonal level and its relationship to leadership qualities.

A list of designated subjects for meeting the leadership and intra-personal development requirement is available at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

(d) Service-Learning

All students must successfully complete one 3-credit subject designated to meet the Service-Learning Requirement, in which they are required to (i) participate in substantial community service or civic engagement activities that will benefit the service users or the community at large in a meaningful way, (ii) apply the knowledge and skills acquired from their Major or other learning experiences at the University to the community service activities, and (iii) reflect on their service learning experience in order to link theory with practice for the development of a stronger sense of ethical, social and national responsibility.

These subjects may take the form of:

- An open-to-all GUR service-learning subject
- A GUR service-learning subject targeted at a particular student group (e.g. a Broad Discipline), or
- A customised DSR subject (core or elective) within the Major/Minor with all the required features and components to meet the Service-Learning Requirement.

Students who have satisfied the Service-Learning Requirement via a customised DSR subject will be required to take another 3-credit subject to make up for the total credit requirement.

A list of designated subjects for meeting the service-learning requirement is available at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

(e) Cluster Areas Requirement (CAR)

To expand students' intellectual capacity beyond their disciplinary domain and to enable them to tackle professional and global issues from a multidisciplinary perspective, students are required to successfully complete at least one 3-credit subject in each of the following four Cluster Areas:

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

A list of CAR subjects under each of the four Cluster Areas is available at:
https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

(f) China Studies Requirement

Of the 12 credits of CAR described in (e) above, students are required to successfully complete a minimum of 3 credits on CAR subjects designated as "China-related". The purpose is to enable students to gain an increased understanding of China (e.g. its history, culture and society, as well as emerging issues or challenges).

A list of approved CAR subjects for meeting the China Studies Requirement is available at:
https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

(g) Healthy Lifestyle

Healthy lifestyle is the platform for all-round development. Students are required to successfully complete a non-credit-bearing programme in healthy lifestyle.

With effect from the 2015/16 intake cohort, students will be required to complete the following components: (i) sports training/participation, (ii) e-learning modules, and (iii) lectures/talks. The syllabus covers physical health, mental health, social health, spiritual health, values and priorities on health behaviour with reference to competing priorities in life, reflection on healthy living and plans for self-improvement or maintenance of health behaviour. Details of the programme can be found at: http://www.polyu.edu.hk/ogur/student/4yr/gur/hls/revised

Students on Articulation Degree programmes and Senior Year intakes to the 4-year Ug degree programmes are not required to take the Healthy Lifestyle Programme. Advanced Standing students are required to take HLS (except for those who are HD/AD holders who follow the Senior Year/Articulation Degree programme GUR curriculum).

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