THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

# Higher Diploma
# in Electrical Engineering

Full-time

Programme Code : 41373

2012/2013

DEFINITIVE PROGRAMME DOCUMENT

Department of
Electrical Engineering
電機工程學系

Aug.2012

HD in Electrical Engineering 2012 – 2013

2012/2013 Higher Diploma in Electrical Engineering (41373)

# The Hong Kong Polytechnic University

# Department of Electrical Engineering


## Higher Diploma in Electrical Engineering

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**HIGHER DIPLOMA IN ELECTRICAL ENGINEERING 2012-13**

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## Important

**This Definitive Programme Document is subject to review and changes which the Programme Host Faculty/Department can decide to make from time to time. Students will be informed of the changes as and when appropriate.**

# PART A : INTRODUCTION

## A 1 Preamble

### A 1.1 PROGRAMME AIMS

The programme aims to provide the students with a sound education in electrical engineering. The programme is designed to produce engineering technologists/technicians who will be able to practice electrical engineering with competence in Hong Kong, China and the neighboring regions. The programme emphasizes on foundation level knowledge and its applications, practical skills, problem-solving ability, and team-work spirit.

The new two year Higher Diploma (HD) Programme aligns its intake with the graduates coming from the New Senior Secondary Curriculum (NSS) and the Hong Kong Institute of Vocational Education (IVE). This new HD Programme also paves the way for graduates to further their study for a professional qualification. Graduates could obtain up to two years of exemption for the study of a four-year Honors degree programme of similar discipline.

## A 2 General Information - Higher Diploma Programme

### A 2.1 PROGRAMME CODE AND TITLE

41373 - Higher Diploma in Electrical Engineering

### A 2.2 DURATION AND MODE OF ATTENDANCE

Normally 2 years Full-time. The maximum period of registration is 4 years.

### A 2.3 FINAL AWARD

Higher Diploma in Electrical Engineering

### A 2.4 IMPLEMENTATION DATE

September 2012 (i.e. for the 2012/2013 academic year)

## A 2.5 MINIMUM ENTRANCE REQUIREMENTS

For those applying on the basis of **HKDSE**, the candidate should satisfy the University's General Entrance Requirements of 5 HKDSE subjects at Level 2 including English Language and Chinese Language. There is no compulsory subject requirement. Preferred elective subjects for the programme include:

- Mathematics;
- Extended modules of Mathematics;
- Information & Communication Technology;
- Physics, Biology, Chemistry, and Combined Science.

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

- HKALE Grade E or above in 1 of the following subjects: Physics; Engineering Science; Pure Mathematics; Applied Mathematics; Chemistry and Computer Studies; OR
- HKALE (AS-Level) Grade E or above in 2 of the following subjects: Physics; Design & Technology; Mathematics & Statistics; Applied Mathematics; Chemistry; Computer Applications and Electronics;

AND

- HKCEE Grade D or above in Mathematics or Addi-tional Mathematics (only required for applicants without E in HKALE Applied Mathematics or Pure Mathematics; OR in HKALE (AS-Level) Applied Mathematics or Mathemat-ics & Statistics); AND
- HKCEE Grade E or above in Physics or Engineering Science (only required for applicants without E in HKALE Physics or Engineering Science; OR in HKALE (AS-Level) Physics or Design & Technology).

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

- Diploma in Electrical Engineering or in Electronics & Communications Engineering; OR
- Higher Certificate in Electrical Engineering or in Electronic Engineering.

## A 2.6 EXTERNAL RECOGNITION

This Higher Diploma programme will seek accreditation by the Engineering Council for exemption from its Part-1 Examinations for professional membership.

# A 3 Curriculum

The time-tabled student hours for each subject and the type of activity (lecture [Lt], tutorial [Tu] and laboratory [Lab]) are given in the Table A3.1, A3.2 and A3.3. The abbreviations used in these tables are:

| | | | |
|---|---|---|---|
| AMA | Applied Mathematics | AP | Applied Physics |
| CBS | Chinese & Bilingual Studies | EE | Electrical Engineering |
| ELC | English Language Centre | ENG | Engineering Faculty |
| GEC | General Education Centre | IC | Industrial Centre |

Subjects are referenced by a Departmental prefix (e.g. EE corresponds to Electrical Engineering) followed by a reference number. Each subject is also categorised as non-deferrable (**Non-Def**) or deferrable (**Def**). In the reference numbers, the first digit (i.e. 1,2,3 or 4) indicates the level of the subject.

'*Non-def*' are those subjects which form the backbone of the vertical integration must be taken by every student in the prescribed semester, unless prevented from doing so due to non-compliance with prerequisities.

'*Def*' are those subjects which must be satisfactorily completed before the student becomes eligible for an award but the timing of the subject is determined by the student. Tables in Section A4 show the times (semester) in which these subjects are *recommended* to be taken if the programmes are to be completed in the minimum time.

| Level 0 and 1 | | Curriculum | | | | | Assessment Method | |
|---|---|---|---|---|---|---|---|---|
| | | Teaching Dept. | Contact Hours | | Credits | GPA Weight ($W_i$) | | |
| Subject Code | Subject Title | | Lt/ Tu | Lab | | | Continuous | Exam |
| | **Non Def Subjects** | | | | | | | |
| AMA1100 | Basic Mathematics - an introduction to Algebra and Differential Calculus | AMA | 28 | - | 2 | 0.2 | 40% | 60% |
| AMA1101 | Calculus I | AMA | 56 | - | 4 | 0.2 | 40% | 60% |
| AMA1102 | Calculus IA | AMA | 56 | - | 4 | 0.2 | 40% | 60% |
| AMA1103 | Introductory Linear Algebra | AMA | 28 | - | 2 | 0.2 | 40% | 60% |
| AMA1104 | Introductory Probability | AMA | 28 | - | 2 | 0.2 | 40% | 60% |
| AP00002 | Foundation Physics I | AP | 42 | - | 3 | - | 40% | 60% |
| AP00003 | Foundation Physics II | AP | 42 | - | 3 | - | 40% | 60% |
| AP10004 | Physics Experiment | AP | - | 36 | 1 | 0.2 | 100% | - |
| AP10008 | University Physics I | AP | 42 | - | 3 | 0.2 | 40% | 60% |
| AP10009 | University Physics II | AP | 42 | - | 3 | 0.2 | 40% | 60% |
| CBS0103P | Chinese Communication for Higher Diploma | CBS | 42 | - | 3 | - | 100% | - |
| CBS1101P | Fundamentals of Chinese Communication | CBS | 42 | - | 3 | 0.2 | 60% | 40% |
| CBS1102P | Advanced Communication Skills in Chinese | CBS | 42 | - | 3 | 0.2 | 70% | 30% |
| ELC0011 | English Communication Skills I | ELC | 42 | - | 3 | - | 100% | - |
| ELC0012 | English Communication Skills II | ELC | 42 | - | 3 | - | 100% | - |
| ELC1011 | Practical English for University Studies | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ELC1013 | English for University Studies | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ELC1014 | Advanced English for University Studies | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ELC2011 | Advanced English Reading and Writing Skills | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ELC2012 | Persuasive Communication | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ELC2013 | English in Literature and Film | ELC | 42 | - | 3 | 0.2 | 100% | - |
| ENG1003 | Freshman Seminars for Engineering | ENG | 43 | - | 3 | 0.2 | 100% | - |
| Depending on the subjects taken | Cluster Areas Requirement (CAR) subjects (subjects taken must conform to the University's Cluster Area Requirements specified in Section A 3.1) | Various Depts | 42 | - | 3 | 0.2 | depending on the subjects taken | depending on the subjects taken |

**Table A3.1**

| Level 2 | | Curriculum | | | | | Assessment Method | |
|---|---|---|---|---|---|---|---|---|
| | | Teaching Dept. | Contact Hours | | Credits | GPA Weight ($W_i$) | | |
| Subject Code | Subject Title | | Lt/ Tu | Lab | | | Continuous | Exam |
| | **Non Def Subjects** | | | | | | | |
| AMA2111 | Mathematics I | AMA | 42 | - | 3 | 0.2 | 40% | 60% |
| AMA2112 | Mathematics II | AMA | 42 | - | 3 | 0.2 | 40% | 60% |
| EE2002C | Circuit Analysis | EE | 42 | 9 | 3 | 0.2 | 40% | 60% |
| EE2003C | Electronics | EE | 42 | 12 | 3 | 0.2 | 40% | 60% |
| EE2004C | Electrical Energy Systems Fundamentals | EE | 36 | 12 | 3 | 0.2 | 40% | 60% |
| EE2007C | Computer Systems Fundamentals | EE | 36 | 12 | 3 | 0.2 | 40% | 60% |
| EE2008C | Group Project | EE | - | - | 4 | 0.2 | 100% | |
| | **Def Subjects** | | | | | | | |
| ENG2002 | Computer Programming | ENG | 64 | - | 3 | 0.2 | 100% | - |
| Depending on the subjects taken | Cluster Areas Requirement (CAR) subjects (subjects taken must conform to the University's Cluster Area Requirements specified in Section A 3.1) | Various Depts | 42 | - | 3 | 0.2 | depending on the subjects taken | depending on the subjects taken |
| | **IC Training** | | | | | | | |
| IC2105 | Engineering Communication and Fundamentals | IC | 120 hours throughout the year | | 4 Training Credits | - | 100% Assessed and graded | - |
| IC2112 | IC Training I (EE) | IC | 120 hours in Summer | | 4 Training Credits | - | 100% Assessed and graded | - |

**Table A3.2**

| Level 3 | | Curriculum | | | | | Assessment Method | |
|---|---|---|---|---|---|---|---|---|
| | | Teaching Dept. | Contact Hours | | Credits | GPA Weight ($W_i$) | | |
| Subject Code | Subject Title | | Lt/ Tu | Lab | | | Continuous | Exam |
| | **Def Subjects** | | | | | | | |
| EE3002C | Electromechanical Energy Conversion | EE | 36 | 12 | 3 | 0.3 | 40% | 60% |
| EE3003C | Power Electronics and Drives | EE | 36 | 12 | 3 | 0.3 | 40% | 60% |
| EE3009C | Electrical Services in Buildings | EE | 42 | - | 3 | 0.3 | 40% | 60% |

**Table A3.3**

## A 3.1 CLUSTER AREA REQUIREMENTS (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 two 3-credit subjects within the following four Cluster Areas:

- Human Nature, Relations and Development (HRD)
- Community, Organisation and Globalisation (COG)
- History, Culture and World Views (HCW)
- Science, Technology and Environment (STE)

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

In addition, students are required to successfully complete a 3 credit CAR subject, 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

# A 4 Specified Progression Pattern

Student is advised to follow the curriculum below:

**Year 1 – Semester 1 (Total 13.5 credits plus 2 training credits)**

| Subject Code | Subject | Credits | Criteria for taking different subjects based on HKALE results | Criteria for taking different subjects based on HKDSE results |
|---|---|---|---|---|
| AMA1101 | Calculus I | 4 | Pass in in A-Level Pure Mathematics/ AS-Level Mathematics & Statistics/Applied Maths | Attained Level 2 in EM I or EM II in HKDSE Mathematics |
| AMA1102 | Calculus IA | | Without a Pass in A-Level Pure Mathematics/ AS-Level Mathematics & Statistics/Applied Maths | Have not attained Level 2 in EM I or EM II in HKDSE Mathematics |
| AP10004 | Physics Experiment (½ subject) | 0.5 | | |
| AP10008 | University Physics I | 3 | | |
| CAR | Cluster Area Requirement Subject (see Section A3.1) | 3 | | |
| ENG1003 | Freshman Seminars for Engineering (½ subject) | 1.5 | | |
| ENG2002 | Computer Programming (½ subject) | 1.5 | | |
| IC2105 | Engineering Communication and Fundamentals (120 hours throughout the year) | 2 training credits (total 4 training credits) | | |

**Year 1 – Semester 2 (Total 15.5 credits plus 2 training credits)**

| Subject Code | Subject | Credits | Criteria for taking different subjects based on HKALE results | Criteria for taking different subjects based on HKDSE results |
|---|---|---|---|---|
| AP10004 | Physics Experiment (½ subject) | 0.5 | | |
| AP10009 | University Physics II | 3 | | |
| CBS0103P | Chinese Communication for Higher Diploma | 3 | HKALE Grade E or with any component below E or below Grade E | HKDSE Level 3 with any sub-score below Level 3 or Level 2 |
| CBS1101P | Fundamentals of Chinese Communication | | HKALE Grade D or Grade E with no component below E | HKDSE Level 3 with no sub-score below Level 3 |
| CBS1102P | Advanced Communication Skills in Chinese | | HKALE Grade A/B/C | HKDSE Level 4 /5 or above |
| EE2002C | Circuit Analysis | 3 | | |
| EE2007C | Computer Systems Fundamentals | 3 | | |
| ENG1003 | Freshman Seminars for Engineering (½ subject) | 1.5 | | |
| ENG2002 | Computer Programming (½ subject) | 1.5 | | |
| IC2105 | Engineering Communication and Fundamentals (120 hours throughout the year) | 2 training credits (total 4 training credits) | | |

**Year 1 – Summer (Total 5~7 credits plus 4 training credits)**

| Subject Code | Subject | Credits | Criteria for taking different subjects based on HKALE results | Criteria for taking different subjects based on HKDSE results |
|---|---|---|---|---|
| AMA1103 | Introductory Linear Algebra | 2 | i) Pass in AS-Level Mathematics & Statistics<br>ii) Pass in A-Level Pure Maths + Applied Maths could choose either Introductory Linear Algebra or Introductory Probability | i) Attained Level 2 in HKDSE EM I in Mathematics<br>ii) Have not attained Level 2 in any one of the HKDSE extended modules in Mathematics should take BOTH Introductory Linear Algebra or Introductory Probability |
| AMA1104 | Introductory Probability | 2 | i) Pass in A-Level Pure Mathematics<br>ii) Pass in A-Level Pure Maths + Applied Maths could choose either Introductory Linear Algebra or Introductory Probability | i) Attained Level 2 in HKDSE EM II in Mathematics<br>ii) Have not attained Level 2 in any one of the HKDSE extended modules in Mathematics should take BOTH Introductory Linear Algebra or Introductory Probability |
| EE2003C | Electronics | 3 | | |
| IC2112 | IC Training I | 4 training credits | | |

**Year 2 – Semester 1 (Total 17 credits)**

| Subject Code | Subject | Credits | Criteria for taking Additional Underpinning subjects - HKALE student | Criteria for taking Additional Underpinning subjects - HKDSE student |
|---|---|---|---|---|
| AMA2111 | Mathematics I | 3 | | |
| CAR (China Related) | Cluster Area Requirement - China Related Subject (see section A3.1) | 3 | | |
| ELC0011 | English Communication Skills I | 3 | Grade E (with sub-score below E) or below in AL English should take ELC0011 & ELC0012 | Level 3 (with sub-score at 2) or overall Level 2 in HKDSE English should take ELC0011 & ELC0012 |
| ELC1011 | Practical English for University Studies | | Grade E in AL English should take ELC1011 & ELC1013 | Level 3 in HKDSE English should take ELC1011 & ELC1013 |
| ELC1013 | English for University Studies | | Grade D in AL English should take ELC1013 & ELC1014 | Level 4 in HKDSE English should take ELC1013 & ELC1014 |
| ELC1014 | Advanced English for University Studies | | Grade C or above in AL English should take ELC1014 & 1 ELC elective (ELC2011/12/13) | Level 5 or above in HKDSE English should take ELC1014 & 1 ELC elective (ELC2011/12/13) |
| EE2004C | Electrical Energy Systems Fundamentals | 3 | | |
| EE2008C | Group Project (½ subject) | 2 | | |
| EE3002C | Electromechanical Energy Conversion | 3 | | |

**Year 2 – Semester 2 (Total 14 credits)**

| Subject Code | Subject | Credits | Criteria for taking Additional Underpinning subjects - HKALE student | Criteria for taking Additional Underpinning subjects - HKDSE student |
|---|---|---|---|---|
| AMA2112 | Mathematics II | 3 | | |
| ELC0012 | English Communication Skills II | 3 | Grade E (with sub-score below E) or below in AL English should take ELC0011 & ELC0012 | Level 3 (with sub-score at 2) or overall Level 2 in HKDSE English should take ELC0011 & ELC0012 |
| ELC1013 | English for University Studies | | Grade E in AL English should take ELC1011 & ELC1013 | Level 3 in HKDSE English should take ELC1011 & ELC1013 |
| ELC1014 | Advanced English for University Studies | | Grade D in AL English should take ELC1013 & ELC1014 | Level 4 in HKDSE English should take ELC1013 & ELC1014 |
| ELC2011/12/13(either one of these subjects) | Advanced English Reading and Writing Skills/ Persuasive Communication/ English in Literature and Film | | Grade C or above in AL English should take ELC1014 & 1 ELC elective (ELC2011/12/13) | Level 5 or above in HKDSE English should take ELC1014 & 1 ELC elective (ELC2011/12/13) |
| EE2008C | Group Project (½ subject) | 2 | | |
| EE3003C | Power Electronics and Drives | 3 | | |
| EE3009C | Electrical Services in Buildings | 3 | | |

**Table A4.1**

## Additional Underpinning Subjects in Physics & Mathematics

| Semester | Subject Code | Subject | Credits | Criteria for taking Additional Underpinning subjects - HKALE student | Criteria for taking Additional Underpinning subjects - HKDSE student |
|---|---|---|---|---|---|
| **Year 1**<br>**Semester 1** | AMA1100 | Basic Mathematics - an introduction to Algebra and Differential Calculus | 2 | Without a Pass in A-Level Pure Mathematics/ AS-Level Mathematics & Statistics/Applied Maths | Have not attained Level 2 in EM I or EM II in HKDSE Mathematics. |
| | AP00002 | Foundation Physics I | 3 | Without a Pass in HKALE Physics or Engineering Science, or HKALE(AS-Level) Physics; AND without a Pass in HKCEE Physics or Engineering Science | Have not attained Level 2 in HKDSE Physics or Combined Science (with a component in Physics) |
| | AP00003 | Foundation Physics II | 3 | | |

**Table A4.2**

### Total Credits required for Graduation

The total study credits is ranging from 65 – 75 (plus 8 training credits) depending on the students' HKALE or HKDSE results as students may be required to take extra subjects in Mathematics/Physics depending on their entry qualifications.

## A 4.1 ADDITIONAL ENGLISH LANGUAGE STUDY REQUIREMENT

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

Students entering with the following HKDSE results, or those entering in 2012/13 with the following HKALE results, are required to take two 3-credit HDLCR English subjects:

- HKDSE Level 2
- HKDSE level 3 with any sub-score below level 3
- HKALE Grade E with any component below E
- below HKALE Grade E

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

Students entering with the following HKDSE results, or those entering in 2012/13 with the following HKALE results, are required to take LCR English subjects at the bachelors' degree level according to their level of English language proficiency at entry:

- HKDSE Level 3 with no sub-score below Level 3
- above HKDSE Level 3
- HKALE Grade E with no component below E
- above HKALE Grade E

## A 4.2 ADDITIONAL CHINESE LANGUAGE STUDY REQUIREMENT

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

Students entering with the following HKDSE results, or those entering in 2012/13 with the following HKALE results, are required to take one 3-credit HDLCR Chinese subject:

- HKDSE Level 2
- HKDSE Level 3 with any sub-score below Level 3
- HKALE Grade E with any component below E
- below HKALE Grade E

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

Students entering with the following HKDSE results, or those entering in 2012/13 with the following HKALE results, are required to take LCR Chinese subject at the bachelors' degree level according to their level of Chinese language proficiency at entry:

- HKDSE Level 3 with no sub-score below Level 3
- above HKDSE Level 3
- HKALE Grade E with no component below E
- above HKALE Grade E

# Part B : PHILOSOPHY AND OBJECTIVES

## B 1 Programme Philosophy

The Higher Diploma (HD) programme aims to provide the necessary balance of theoretical studies and practical training to prepare students for a career as a higher technician or technician engineer in the field of electrical engineering. Graduates from the programme are expected to be able to assume technical positions to apply current technologies, make technical judgements, transfer and develop new technologies, and communicate clearly both in writing and orally at supervisory positions.

To achieve these aims, the programme is designed to consist of a balance of lectures/tutorials, laboratory work, practical training in the Industrial Centre and a group project. The curriculum includes studies in the main streams of electrical theory and is supported by mathematics, computing, electronics, mechanical engineering, English, Chinese and general studies.

HD and the BEng programmes have a similar curriculum and syllabuses. This similarity of the HD programme and the Degree programme is specially adopted in the Department to facilitate teaching and student learning.

## B 2 Programme Objectives

The programme objectives are as follows:

1. The program aims to provide HD students with a sound education in electrical engineering.
2. The program is designed to produce engineering technologist/technicians who will be able to practice electrical engineering and related disciplines.
3. The programme emphasizes on foundation level knowledge, application techniques, practical skills, problem solving ability, and team work spirit.
4. The programme also paves the way for graduates to further their study for a higher professional qualification.

## B 3 Programme Outcomes

To achieve the aims of producing higher technicians, the programme is designed to consist of a balance of lectures/tutorials, practical laboratory work, practical workshop training in the Industrial Centre and project. The curriculum includes studies in the mainstreams of electrical engineering supported by mathematics, computing, electronics, English, Chinese and general studies.

The approach will highlight the importance of practical application of electrical theory, with more emphasis being placed on applications. The workshop training and the laboratory training work will be an important part of the curriculum and reference is regularly made whenever possible to supplement the theoretical teaching in classrooms.

The University aspires to develop all its students as all-round graduates with professional competence, and has identified a set of highly valued graduate attributes as the learning goals for students. While many of these graduate attributes can be developed through the curricular activities of this programme, some (including interest in local and international affairs, interpersonal skills, sense of social and national responsibility, cultural appreciation, biliteracy and trilingualism, and entrepreneurship) will be primarily addressed through co-curricular activities offered by faculties, departments, and various teaching and learning support units of the University. Students are encouraged to make full use of such opportunities to develop these attributes.

Following the University's aim of producing all-rounded graduates with professional competence, the Higher Diploma programme aims to develop students in the four main areas – to be a (i) competent professional, (ii) creative problem solver, (iii) effective communicator, and (iv) educated global citizen. Detail explanation of these areas is listed in the table below:

| **Competent Professionals - A1, A2, A3, & A4** | |
|---|---|
| **A1**<br>Professional Competence | Have a solid technical education in Electrical Engineering based on the understanding of its fundamentals and its current applications. Possess broad engineering knowledge to enable the graduates to adapt, to change, and to satisfy likely career diversions |
| **A2**<br>Practical Skills | Be able to apply modern experimental techniques and to be practical minded. Aware of technical and non-technical constraints |
| **A3**<br>Teamwork and Leadership | Possess social abilities including inter-personal/public relations, team work, and social consciousness. |
| **A4**<br>Global Outlook and Lifelong Learning | Possess an inquiring and innovative attitude thus encouraging the individual to acknowledge the developments in Electrical Engineering. To keep abreast of the developments in Electrical Engineering and an appreciation and the desire for lifelong learning. |
| **B Creative Problem Solvers** | |
| Creative Thinking and Problem Solving | Apply the fundamental principles to solve problems in the area of Electrical Engineering and related disciplines. Possess intellectual abilities including creative and critical thinking. |
| **C Effective Communicators** | |
| Biliteracy, Trilingualism, & Communication Skills | Language proficiency in English and Chinese to communicate clearly via graphic, numeric, verbal and written media. |
| **D Educated Global Citizens** | |
| Social Responsibilities | Have awareness and understanding of the ethical and social responsibilities of a technician engineer. |

**Table B3.1**

The Programme Outcomes are in line with the Programme Objectives, and the corresponding mapping is shown in table B3.2.

| | | **Programme Objectives** | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| **Programme Outcomes** | A1 | √ | √ | | √ |
| | A2 | | √ | √ | |
| | A3 | | | √ | |
| | A4 | | | | √ |
| | B | √ | | | |
| | C | √ | √ | | |
| | D | | √ | | |

**Table B3.2**

The Subject Learning Outcomes are designed to be in alignment with the Programme Outcomes. The Subject Learning Outcomes are given in each subject and they can be found in the Subject Descriptions Forms in Part E.

The programme and subject outcomes will be assessed in stages according to a Learning Outcomes Assessment Plan (LOAP) adopted by the Departmental Learning and Teaching Committee.

Relationship between Institutional Learning Outcomes and Intended Learning Outcomes (ILO) of the programme is shown in Table B3.3.

| | | Institutional Learning Outcomes | | | | | |
|---|---|---|---|---|---|---|---|
| | | Professional competence | Critical thinker | Effective communicator | Innovative problem solver | Lifelong learner | Ethical leader |
| Programme Outcomes | A1 | √ | √ | | √ | | |
| | A2 | √ | √ | | √ | | |
| | A3 | √ | | √ | | | √ |
| | A4 | √ | | | | √ | |
| | B | | √ | | √ | | |
| | C | | | √ | | | |
| | D | | | | | | √ |

**Table B3.3 Relationship between Institutional Learning Outcomes and Intended Learning Outcomes (ILO) of the programme**

## B 4 Subject support to Programme Outcomes

| Subjects | Programme Outcomes | | | | | | |
|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | A4 | B | C | D |
| AMA1100 | | | | | X | X | |
| AMA1101 | | | | | X | X | |
| AMA1102 | | | | | X | X | |
| AMA1103 | | | | | X | X | |
| AMA1104 | | | | | X | X | |
| AMA2111 | | | | | X | X | |
| AMA2112 | | | | | X | X | |
| AP00002 | X | | | | X | X | |
| AP00003 | X | | | | X | X | |
| AP10004 | | X | | | X | X | |
| AP10008 | X | | | | X | X | |
| AP10009 | X | | | | X | X | |
| CBS0103P | | | | | | X | |
| CBS1101P | | | | | | X | |
| CBS1102P | | | | | | X | |
| EE2002C | X | | | | X | | |
| EE2003C | X | | | | | | |
| EE2004C | X | | | X | X | | X |
| EE2007C | X | | | X | X | | |
| EE2008C | X | X | X | X | X | X | |
| EE3002C | X | | | X | X | | |
| EE3003C | X | | | | | | |
| EE3009C | X | | | X | X | | X |
| ELC0011 | | | | | | X | |
| ELC0012 | | | | | | X | |
| ELC1011 | | | | | | X | |
| ELC1013 | | | | | | X | |
| ELC1014 | | | | | | X | |
| ELC2011 | | | | | | X | |
| ELC2012 | | | | | | X | |
| ELC2013 | | | | | | X | |
| ENG1003 | X | | X | X | | X | X |
| ENG2002 | X | | | | X | | |
| CAR | | | | X | | X | X |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CAR (China related) | | | | X | | X | X |
| IC2105 | | X | | | | | |
| IC2112 | | X | X | | | | |

**Table B4.1**

Table B4.1 illustrates how the subjects support the Programme Outcomes through the teaching activities, practice on the part of students, and measurements.

# Part C : Educational and Assessment Methodologies

## C 1 Teaching and Learning

### C 1.1 PHILOSOPHY

The philosophy has been to gradually introduce an approach in which the lecturers are encouraged to "teach" less and the students to learn more. The Department's teaching approach is being revised continuously so as to enhance the students' ability to find out and learn for themselves.

Teaching methods for replacing the out-dated ‘chalk and talk' approach, or the ‘monologue' lecturing style, with ‘interactive teaching’, are being further developed and promoted. It has indeed been our Department Policy to regard it as one of the top priorities, together with research. All of the classroom sessions are conducted as a combination of lecturing and tutoring, so that the active participation of the student is realized at all times. Other teaching aids such as interactive handouts, concept mapping, and computer aided learning software are also extensively utilized.

### C 1.2 APPROACH USED

#### C 1.2.1 **Teaching and Learning**:

The approach is to wean students from rote-learning to self-study. The form of classroom teaching, however, is changing to become much more stimulating, with more student input expected. Tutorials are now integrated with the lectures, to give regular changes of activity within the lecture period, and thus keeping the students interested, alert, and participative.

The accepted philosophy is that ‘if we perform the mental work for the learner, we reduce the learner’s investment in learning, thereby reducing performance’. The student is encouraged and aided to adopt a ‘deep’ approach to study, which means that he should try to understand the underlying meaning rather than try to remember the words and the formulas, and to develop a critical awareness of the concepts being discussed and the relationship of these to other concepts. Emphasis is placed on the student’s understanding of the basic principles and concepts. Students are not allowed to lose sight of the overall picture as a result of over-indulgence in mathematical details. Technical assumptions made in developing and applying basic theory are stressed. Emphasis is given to developing creativity and the ability to design. Students are not compelled to memorize large amounts of facts and formulas (except fundamental ones). The importance of problem solving in facilitating a full understanding of the topic is recognized. However, problem solving is not treated merely as a means of employing mathematical methods, but also for applying concepts. Problem solving is implemented extensively in all aspects of the Programme. The students are encouraged to think around the subject matter.

Handout notes are used extensively throughout the Programme, but it is generally intended that these, in themselves, are incomplete. Students will need to fill out the handouts before, during and after the lectures before the content can be regarded as complete. In this way, and by requiring students to submit regular written reports, the students develop their ability to write clearly and concisely.

From the outset, students are encouraged and provoked into taking an active role in the learning process. The quality of a student's answers to questions, and the quality of the questions asked by the student, is evaluated to provide feedback throughout the Programme in each subject. Towards the end of the 1st year, and throughout the remainder of the Programme, it is the norm for students to give presentations of topics within the syllabus in front of their peers. This not only encourages them to adopt a self-study pattern, it also increases their self-confidence, their ability to argue from fundamentals and stresses their need to study the subject matter in depth to be able to answer questions from their peers.

### C 1.2.2 **Laboratory and Projects:**

In the Programme, the laboratory work is integrated into each subject, as is the assessment for the laboratory work. It is the subject-lecturer's responsibility to ensure that the laboratory work is being taken seriously by the students and to stimulate them by gradually moving into open-ended experiments/tests and mini-projects with design elements included.

Students are required to preview their laboratory assignments. As with lectures, the process of generating a self-learning attitude is gradual. In the early part of the Programme, laboratory sheets have fairly detailed instructions and students preview the experiments by means of a 'theory' section in the experiment instruction sheet. As students progress, less detailed information is presented and the student is expected to read around the experiment and contribute their own ideas as to how the experiment should be conducted.

Students are required to use log books for all experiments and to submit these and some formal laboratory reports for assessment.

Essentially each student is required to undertake a project. The projects are designed to be small group projects in which two or three students work on different aspects of a more ambitious project, while taking care that individual students are still assigned individual responsibility for their part of the work. This allows students to learn team work and it enables more advanced projects to be undertaken. As part of the supervision of the students' project and laboratory work, they are guided to gain skills such as the following:

1. Attention to detail and recognition that unless everything is done thoroughly, completely and correctly, their design, product or process may well be useless.

2. Ability to apply scientific methods to their work. This involves the discipline of keeping accurate and up-to-date records, to be constantly questioning both good and unexpected results, knowing how to go about experimental procedures, how to set up experiments and draw conclusions.

3. Recognition that they have to take personal responsibility for their work, to make sure that there are no mistakes, and not to assume that someone else will check their work.

4. Experience in working as part of a team, recognising that others can contribute necessary complementary skills and experience.

## C 2 Industrial Centre (IC) Training

Students are required to undertake practical training at the Industrial Centre of the Polytechnic University, which is equivalent to 8 training credits. The training is scheduled partly during term time of Year One and partly in the summer at the end of Year One to give students an appreciation, with some practical involvement, of fitting, machining, electrical wiring, installation, and electronic/electrical equipment manufacturing. Students would gain theoretical knowledge which they can relate to practical applications. An appreciation of practical manufacturing processes is very important to enable the students to apply their theoretical knowledge to practical problems after they graduate from the Programme and start working in industry.

**The following information with regard to IC training should be noted by all Higher Diploma Students:**

- These training credits will not be counted towards meeting the credit requirement for FT status of students.
- These training credits are not to be counted towards the credit requirement for award, but students have to pass (i.e. obtaining Grade D or above) IC training in order to be considered for an award.
- IC training will be graded at any time when an assessment is made. Only **ONE** aggregate grade would be given for an academic year to sum up the performance of the student in IC training for that year.
- If assessment of an IC subject completed in a particular academic year cannot be done in time for the grade to be reported in that particular year, the grade has to be reported during Semester One of the following academic year.
- The results of IC training would not be counted towards the Weighted GPA which is used for considering award classification.
- The results of IC training would be counted towards GPA calculation, which is computed at the end of every semester on the basis of the students' performance on all subjects taken since the start of their studies.

## C 3 Student Feedback Questionnaire (SFQ)

The Student Feedback Questionnaire (SFQ) is a system that PolyU uses to collect feedback from students on teaching and learning. The SFQ system is faculty-based, i.e., different faculties may have slightly different policies, procedures, and SFQ forms. However, the purposes, processing, and intended uses of the SFQ are essentially the same.

Under this system, students are asked to complete the SFQ in class to provide feedback on their experience of studying a subject. This SFQ exercise normally takes place in the last few weeks of the semester. However, for subjects that involve more than one teacher, it may take place earlier, when the teaching of the particular lecturer comes to an end. Some lecturers may also use the mid-semester SFQ to solicit feedback from students so as to modify or adjust their teaching to improve learning for the remaining weeks of the semester.

The PolyU values good teaching. We cherish the promotion of meaningful and relevant learning for our students, and believe that both teachers and students have a shared responsibility to enhance learning. Your feedback on teaching and learning will provide valuable information for us to assure the quality of our programmes, identify the strengths and weaknesses of the existing teaching and learning methodologies, and help us to improve the quality of teaching in the PolyU.

## Part D: ADMISSION, REGISTRATION AND ASSESSMENT

# D Admission, Registration and Assessment

The admission, registration and assessment arrangements described below, are in accordance with the University policies and regulations for credit-based programmes which lead to an award of the University, except where the Senate decides otherwise.

## D 1 Admission/Registration

Students are normally admitted into the programme via the joint admission scheme (JUPAS) on a yearly basis. Non-JUPAS applicants are also considered on their academic merits, as well as non-academic achievements.

## D 2 Concurrent enrolment

Students are not permitted to enroll concurrently on two full-time/sandwich programmes, whether or not one of the programmes is offered by another institution.

Except for programmes which do not lead to any formal award, students are not allowed to enrol concurrently on a full-time/sandwich programme and a part-time programme, or on more than one part-time programmes, including those offered by another institution, without permission from the Head(s) of Department concerned.

## D 3 Subject registration and withdrawal

In addition to programme registration, students need to register for the subjects at specified periods prior to the commencement of the semester. An add/drop period will also be scheduled for each semester / term. 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. Applications must be submitted 1 month before the commencement of the examination period. For approved applications of subject withdrawal, 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.

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.

Students will be allowed to take additional subjects for broadening purpose, after they fulfill the graduation requirements and for the following semester. 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, and their enrolment will be as subject-based students only.

## D 4 Study Load

For students following the progression pattern specified for their programme, they have to take the number of credits, as specified in this Definitive Programme Document, for each semester.

The average 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 programme offering Department. For such cases, students should be reminded that the study load approved should not be taken as grounds for academic appeal.

Students are not allowed to take zero subject in any semester, including the mandatory summer term as required. Unless they have obtained prior approval from the Department; otherwise they will be classified as having unofficially withdrawn from their 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.

## D 5 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.

## D 6 Credit transfer

Students may be given credits for recognized previous studies (including mandatory General University Requirements (GUR) subjects), and the credits will be counted towards meeting the requirements for award. Credit transfer normally will be done without the grade being carried over. Subject credit transfer is normally decided by the subject offering Department.

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. In cases where 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.

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.

## D 7 Deferment of study

Students may apply for deferment of study if they have a genuine need to do so such as illness. Approval from the Department offering the programme is required. The deferment period will not be counted towards the maximum period of registration.

Application for deferment of study will be entertained only in exceptional circumstances from students who have not yet completed the first year of the programme.

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.

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

## D 8 General Assessment Regulations

The University's General Assessment Regulations (GAR) applies to this Programme. The specific assessment regulations are set out here, having been developed within the framework of the GAR.

Students progress by credit accumulation, i.e. credits earned by passing individual subjects can be accumulated and counted towards the final award.

*(a) Subject Level*

A 'level' in a programme indicates the intellectual demand placed upon students and may characterize each subject with respect to its recommended sequencing within that programme. Upper level subjects should normally build on lower level subjects. Pre-requisite requirements, if any, must therefore be spelt out on a subject basis.

A 'subject' is defined as a discrete section of the programme which is assigned a separate assessment. A list of subjects, together with their level and weightings, shall be published in the definitive programme document.

*(b) Language of assessment*

The language of assessment for all programmes/subjects shall be English, unless approval is given for it to be otherwise.

## D 9 Principles of assessment

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 should be designed for this purpose. The assessment methods will also enable the teacher to differentiate students' different levels of performance within the subject. Assessment for learning is to engage students in productive learning activities through purposefully designed assessment tasks.

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

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.

## D 10 Assessment methods

Students' performance in a subject can be assessed by continuous assessment and/or examinations, at the discretion of the individual subject offering Department. Where both continuous assessment and examinations are used, the weighting of each in the overall subject grade shall be clearly stated in the definitive programme document. 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) shall be specified in the Definite Programme Document. Learning outcome should be assessed by continuous assessment and/or examination appropriately, in line with the outcome-based approach.

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.

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

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

## D 11 Progression/Academic Probation/Deregistration

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), determine whether each student is

(a) eligible for progression towards an award; or
(b) eligible for an award; or
(c) required to be deregistered from the programme.

When a student has a Grade Point Average (GPA) lower than 2.0, he will be put on academic probation in the following semester. If a student is able to pull his GPA up to 2.0 or above at the end of the semester, the status of "academic probation" will be lifted. The status of "academic probation" will be reflected in the examination result notification but not in the transcript of studies.

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

(a) the student has exceeded the maximum period of registration for that programme, as specified in the Definitive Programme Document; or

(b) the student's GPA is lower than 2.0 for two consecutive semesters and his Semester GPA in the second semester is also lower than 2.0; or

(c) the student's GPA is lower than 2.0 for three consecutive semesters.

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.

A student may be de-registered from the programme enrolled before the time frame specified at (ii) or (iii) above if his academic performance is poor to the extent that the Board of Examiners deems that his chance of attaining a GPA of 2.0 at the end of the programme is slim or impossible.

Where there are good reasons, the Board of Examiners has the discretion to recommend allowing students who fall into categories as stated at (ii) or (iii) above to stay on the programme, and these recommendations should be presented to the relevant Faculty/School Board for final decision.

Under the current procedures, a student can appeal against the decisions of Boards of Examiners to de-register him. If such an appeal was upheld by the Department/School concerned, the recommendation (to reverse the previous decision to de-register the student) should also be presented to the relevant Faculty/School Board for final decision.

## D 12 Retaking of subjects

Students may retake any subject for the purpose of 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. 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.

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 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.)

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.

## D 13 Absence from an assessment component

If a student is unable to complete all the assessment components of a subject, due to illness or other circumstances which are beyond his 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 completion of the late assessment.

The student concerned is required to submit his/her application for late assessment in writing to the Head of Department offering the subject, within 5 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.

## D 14 Aegrotat award

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 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.

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

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

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.

## D 15 Grading

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.

| *Codes* | *Interpretation* | **Remarks** |
|---|---|---|
| I # | Assessment to be completed | An incomplete grade must be converted to a regular grade normally in the following academic year at the latest. |
| N | Assessment is not required | — |
| P | Pass an ungraded subject | This code applies to an ungraded subject, such as industrial training. |
| U | Fail an ungraded subject | This code applies to an ungraded subject, such as industrial training. |
| M | Pass with Merit | This code applies to all General Education subjects for intake cohorts before 2010/11. The adoption or otherwise of this code to other subjects adopting a "Pass/Fail" grading system would be subject to the decision of individual Departments.<br><br>The grade "Pass with Merit" can be awarded when the student's work exceeds the subject learning outcomes in the majority of regards. |
| L | Subject to be continued in the following semester | This code applies to subjects like "Project" which may consist of more than 1 part (denoted by the same subject code) and for which continuous assessment is deemed appropriate. |
| S | Absent from assessment | — |
| W | Withdrawn from subject | Dropping of subjects after the add/drop period is normally not allowed. Requests for withdrawal from subjects after the add/drop period and prior to examination will only be considered under exceptional circumstances. This code is given when a student has obtained exceptional approval from Department to withdraw from a subject after the "add/drop" period and prior to examination; otherwise, a failure grade (grade F) should be awarded. |
| Z | Exempted | — |
| T | Transfer of credit | — |

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

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

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

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 |

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

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

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

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

(a) Exempted subjects

(b) Ungraded subjects

(c) Incomplete subjects

(d) Subjects for which credit transfer has been approved, but without any grade assigned[1]

(e) Subjects from which a student has been allowed to withdraw (i.e. those with the code 'W')

[1] 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.

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.

All training credits[2] will be counted in the GPA calculation but not in the WGPA calculation.

## D 16 Different types of GPA's

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.

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.

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 which a student will likely get if he makes steady progress on his academic studies. GUR subjects will be included in the calculation of weighted GPA for all programmes.

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

[2] "Training credits" is used as a generic term only, and also includes clinical/field credits for programmes in different study disciplines. Laboratory experiments done as a subject/an integral part of a subject to satisfy the academic requirements is not considered to be practical training.

| 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.<br><br>(2) For training subjects, including WIE and Clinical/Field subjects, departments can decide whether to include them in the GPA calculation.<br><br>(3) For retake subjects, only the last attempt will be taken in the GPA calculation.<br><br>(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.<br><br>(2) Departments can decide whether the training subjects are to be counted towards the Weighted GPA.<br><br>(3) For retake subjects, only the last attempt will be taken in the Weighted GPA calculation.<br><br>(4) The weighted GPA will be the same as the Award GPA unless a student has taken more subjects than required.<br><br>** Note: The rules will include how weighting are to be assigned according to the level of the subject. This is being reviewed and will be confirmed by Senate before the commencement of the 2012/13 academic year.* |

| Types of GPA | Purpose | Rules for GPA calculation |
|---|---|---|
| Award GPA | For determination of award classification | If the student has not taken more subjects than required, the Award GPA will be as follows:<br><br>(1) For single Major:<br>Award GPA = Weighted GPA<br><br>(2) For Major/Minor programmes:<br>Award GPA = Major GPA |

## D 17 Compulsory Graduation

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

## D 18 Guidelines for award classification

The Weighted GPA will be used as a guide to help determine award classifications, and the level weighting to different subjects of all disciplines and programmes will need to be specified in the Definitive Programme Document.

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 Wi = weighting to be assigned according to the level of the subject (See note below)

n = number of all subjects counted in GPA calculation

Same as for GPA, Weighted GPA is capped at 4.0.

*Note: The rules for determining subject level weighting is being reviewed, and will be confirmed by Senate before the commencement of the 2012/13 academic year.*

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

## D 19 Classification of awards

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

| Classification | GUIDELINES |
|---|---|
| Distinction | The student's performance/attainment is outstanding, and identifies him as exceptionally able in the field of Electrical Engineering. |
| Credit | The student has reached a standard of performance/ attainment which is more than satisfactory but less than outstanding. |
| Pass | The student has reached a standard of performance/ attainment judged to be satisfactory, and has passed the minimum required for graduation. |

There is no requirement for Boards of Examiners to produce award lists which conform to the guidelines of the above table.

## D 20 Examination result announcements, transcripts, testimonials and references

At the end of each semester, where appropriate, examination results are announced online for individual students' checking. It provides information on subjects taken and grades attained, the Grade Point Average (GPA) for all subjects, and the overall result for that semester. The announcement serves as an official notification of the student's academic performance.

A formal transcript of studies will be issued by the University, upon request, to any student registered on a programme offered by the University, and it will include the following information:

(a) name and student number;

(b) title of the programme(s) on which enrolled, or from which graduated;

(c) medium of instruction for the programme (applicable only to programmes which are delivered in Chinese and for which both Chinese and English versions are offered);

(d) a full academic record, giving subjects taken and grades attained, and the Grade Point Average (GPA) for all subjects;

(e) credit requirement of the student if different from the normal credit requirement of the programme;

(f) where relevant, the final award(s) granted, with classification and year of award.

Students may request for a testimonial which is a certification of their studies at the University, but without details on subjects and subject results.

Students may also request for references direct from academic staff/members concerned.

## PART E: SUBJECT DESCRIPTION FORMS

# Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1100</td></tr>
<tr><td>Subject Title</td><td>Basic Mathematics - an introduction to Algebra and Differential Calculus</td></tr>
<tr><td>Credit Value</td><td>2</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Exclusion: HKDSE extended module M1 or M2.</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to the basic concepts and principles of algebra, limit and differentiation. It is designed for those students with only the compulsory mathematics component in the NSS curriculum. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:<br>a. apply mathematical reasoning to solve problems in science and engineering;<br>b. make use of the knowledge of mathematical techniques and adapt known solutions to various situations;<br>c. apply mathematical modeling in problem solving;<br>d. d. demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Mathematical Induction; Binomial Theorem; Functions and inverse functions; Trigonometric functions. Limit concepts, derivatives and their physical & geometric meanings, rules of differentiation.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Basic concepts and techniques of topics in algebra and in elementary differential calculus will be discussed 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><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td></td></tr>
<tr><td>1.Homework, quizzes and mid-term test</td><td>40%</td><td>✓</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><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">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.<br><br>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.<br><br>To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.<br><br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>The subject focuses on understanding of basic concepts and application of techniques in algebra, limit and differentiation. 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>20 Hours</td></tr>
<tr><td>▪ Tutorial</td><td>8 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self study</td><td>42 Hours</td></tr>
<tr><td>Total student study effort</td><td>70 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Hung, K.F., Kwan W.C.K and Pong, G.T.Y. Foundation Mathematics & Statistics, McGraw Hill 2011<br><br>Chung, K.C. A short course in calculus and matrices (2nd edition), McGraw Hill 2010<br><br>Lang, S. Short Calculus, Springer 2002</td></tr>
</table>

# Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1101</td></tr>
<tr><td>Subject Title</td><td>Calculus I</td></tr>
<tr><td>Credit Value</td><td>4</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Pre-requisite: NSS Mathematics plus Module I or Module II</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to the theory and applications of differential and integral calculus. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.</td></tr>
<tr><td>Intended Learning Outcomes<br>(Note 1)</td><td>Upon completion of the subject, students will be able to:<br><br>(a) apply mathematical reasoning to solve problems in science and engineering;<br>(b) make use of the knowledge of mathematical techniques and adapt known solutions to various situations;<br>(c) apply mathematical modeling in problem solving;<br>(d) demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus<br>(Note 2)</td><td>Review of limit and differentiation; indefinite and definite integrals; fundamental theorem of calculus; logarithmic, exponential, trigonometric and hyperbolic functions; techniques of integration; applications.</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>Basic concepts and techniques of calculus 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<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1.Homework, quizzes and mid-term test</td><td>40%</td><td>√</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><td></td></tr>
</table>
</td></tr>
</table>

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Total | 100 % | | | | | | | |

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 calculus. 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 | 42 Hrs. |
| ▪ Tutorial | 14 Hr. |
| Other student study effort: | |
| ▪ Homework and self-study | 84 Hrs. |
| Total student study effort | 140 Hrs. |

**Reading List and References**

K.F. Hung, Wilson C.K. Kwan and Glory T.Y. Pong Basic Mathematics - an introduction to Algebra and Differential Calculus & Statistics, McGraw Hill 2011

Thomas, G.B., Finney, R.L., etc. Thomas' Calculus, Addison Wesley 2004

Lang, S. Short Calculus, Springer 2002

Revised March 2011

# Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1102</td></tr>
<tr><td>Subject Title</td><td>Calculus IA</td></tr>
<tr><td>Credit Value</td><td>4</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Pre-requisite: AMA1100 Basic Mathematics - an introduction to Algebra and Differential Calculus</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to the theory and applications of differential and integral calculus. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:<br>(a) apply mathematical reasoning to solve problems in science and engineering;<br>(b) make use of the knowledge of mathematical techniques and adapt known solutions to various situations;<br>(c) apply mathematical modeling in problem solving;<br>(d) demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Review of limit and differentiation; indefinite and definite integrals; fundamental theorem of calculus; logarithmic, exponential, trigonometric and hyperbolic functions; techniques of integration; applications.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Basic concepts and techniques of calculus 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><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1.Homework, quizzes and mid-term test</td><td>40%</td><td>✓</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><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">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.<br><br>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.<br><br>To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.<br><br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>The subject focuses on understanding of basic concepts and application of techniques in calculus. 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>42 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>14 Hr.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Homework and self-study</td><td>84 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>140 Hrs.</td></tr>
<tr><td>Reading List and References</td><td colspan="2">K.F. Hung, Wilson C.K. Kwan and Glory T.Y. Pong Basic Mathematics - an introduction to Algebra and Differential Calculus & Statistics, McGraw Hill 2011<br><br>Thomas, G.B., Finney, R.L., etc. Thomas' Calculus, Addison Wesley 2004<br><br>Lang, S. Short Calculus, Springer 2002</td></tr>
</table>

Revised March 2011

# Subject Description Form

<table>
<tr><td>Subject Code</td><td>AMA1103</td></tr>
<tr><td>Subject Title</td><td>Introductory Linear Algebra</td></tr>
<tr><td>Credit Value</td><td>2</td></tr>
<tr><td>Level</td><td>1</td></tr>
<tr><td>Pre-requisite / Co-requisite/ Exclusion</td><td>Pre-requisite: NSS Mathematics<br><br>Exclusion: NSS Mathematics Module II</td></tr>
<tr><td>Objectives</td><td>This subject aims to introduce students to some basic principles and knowledge of elementary linear algebra. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.</td></tr>
<tr><td>Intended Learning Outcomes<br>(Note 1)</td><td>Upon completion of the subject, students will be able to:<br><br>(a) apply mathematical reasoning to solve problems in science and engineering;<br><br>(b) make use of the knowledge and techniques in linear algebra and adapt known results to various situations;<br><br>(c) apply mathematical modeling in problem solving;<br><br>(d) demonstrate abilities of logical and analytical thinking.</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus<br>(Note 2)</td><td>Matrices and determinants; systems of linear equations and Gaussian elimination; vectors, inner product, applications.</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>Basic concepts and techniques of matrices, linear systems and vector spaces 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<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1.Homework, quizzes and mid-term test</td><td>40%</td><td>√</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><td></td></tr>
<tr><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="6"></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">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.<br><br>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.<br><br>To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.<br><br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>The subject focuses on understanding of basic concepts and application of techniques in matrices, determinant, linear systems and vectors. 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="7">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture</td><td>20 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>8 Hr.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Homework and self-study</td><td>42 Hrs.</td></tr>
<tr><td>▪</td><td>Hrs.</td></tr>
<tr><td>Total student study effort</td><td>70 Hrs</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Chan, CK, Chan, CW, Hung, KF Basic Engineering Mathematics, McGraw Hill 2011<br><br>Anton, H. Elementary Linear Algebra. John Wiley, 2000</td></tr>
</table>

Revised March 2011

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AMA1104 |
| **Subject Title** | Introductory Probability |
| **Credit Value** | 2 |
| **Level** | 1 |
| **Pre-requisite / Co-requisite/ Exclusion** | Pre-requisite: NSS Mathematics<br><br>Exclusion: NSS Mathematics Module I |
| **Objectives** | This subject aims to introduce students to some basic principles and knowledge of probability. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) apply probabilistic and statistical reasoning to describe and analyze essential features of data sets;<br><br>(b) make use of the knowledge and techniques in probability and adapt known results to various situations;<br><br>(c) develop and extrapolate concepts of probability and statistics in data analysis and problem solving;<br><br>(d) demonstrate abilities of logical and analytical thinking. |
| **Subject Synopsis/ Indicative Syllabus** | Probability, random variables and probability distributions; binomial, geometric, Poison and normal distributions and their applications. Sampling distribution and confidence interval. |
| **Teaching/Learning Methodology** | Basic concepts and techniques of probability and statistics will be taught in lectures. These will be further enhanced in tutorials through practical problem solving and case study. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
| 1.Homework, quizzes and mid-term test | 40% | ✓ | ✓ | ✓ | ✓ | | |
| 2. Examination | 60% | ✓ | ✓ | ✓ | ✓ | | |
| Total | 100 % | | | | | | |

<table>
<tr><td></td><td colspan="2">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.<br><br>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.<br><br>To pass this subject, students are required to obtain grade D or above in both the continuous assessment and the examination components.<br><br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>The subject focuses on understanding of basic concepts and application of techniques in probability distributions, random variables and sampling distribution. 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>20 Hrs.</td></tr>
<tr><td>▪ Tutorial</td><td>8 Hr.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Homework and self-study</td><td>42 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>70 Hrs.</td></tr>
<tr><td>Reading List and References</td><td colspan="2">CHAN, C.K., CHAN, C.W., HUNG, K.F. Basic Engineering Mathematics Updated 3rd edition, McGraw-Hill, 2011<br><br>ANTON, H. Elementary Linear Algebra, Wiley 2000<br><br>KREYSZIG, E. Advanced Engineering Mathematics, Wiley 2006<br><br>JAMES, G. Modern Engineering Mathematics, Pearson 2002<br><br>THOMAS, G.B., WEIR, M.D.,<br><br>HASS, Joel, GIORDANO, F.R.HASS, Joel, GIORDANO, F.R. Thomas' Calculus, Addison Wesley</td></tr>
</table>

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AMA2111 |
| **Subject Title** | Mathematics I |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite / Co-requisite/ Exclusion** | AMA1101 or AMA1102 |
| **Objectives** | This subject aims to introduce students to the basic principles and techniques of engineering mathematics. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical methods in solving practical problems in science and engineering. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) apply mathematical reasoning to analyze essential features of different problems in science and engineering;<br>(b) extend their knowledge of mathematical and numerical techniques and adapt known solutions in various situations;<br>(c) develop and extrapolate the mathematical concepts in synthesizing and solving new problems<br>(d) demonstrate abilities of logical and analytical thinking;<br>(e) search for useful information in the process of problem solving. |
| **Subject Synopsis/ Indicative Syllabus** | *Algebra of complex numbers* Complex numbers, geometric representation, complex exponential functions, *n*-th roots of a complex number.<br><br>*Linear algebra* Review of matrices, determinants and systems of linear equations, vector spaces, inner product and orthogonality, eigenvalues and eigenvectors, applications.<br><br>*Ordinary differential equations* ODE of first and second order, linear systems, Laplace transforms, Convolution theorem, applications to mechanical vibrations and simple circuits.<br><br>*Differential calculus of functions of several variables* Partial derivatives, total differential, chain rule, Taylor's expansion, maxima and minima, directional derivatives, Lagrange multipliers, implicit differentiation, applications. |
| **Teaching/Learning Methodology** | The subject will be delivered mainly through lectures and tutorials. The lectures aim to provide the students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. Tutorials will mainly be used to develop students' problem solving ability. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | |
| 1.Homework, quizzes and mid-term test | 40% | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 2. Examination | 60% | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Total | 100 % | | | | | | |

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 engineering mathematics. 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 | 28 Hours |
| • Tutorial | 14 Hours |
| • Mid-term test and examination | |
| Other student study effort | 5 hours |
| • Assignments and Self study | 73 Hours |
| Total student study effort | 120 Hours |

**Reading List and References**

| | | |
|---|---|---|
| CHAN, C.K., CHAN, C.W., HUNG, K.F. | Basic Engineering Mathematics Updated 3rd edition | McGraw-Hill, 2011 |
| ANTON, H. | Elementary Linear Algebra | Wiley 2000 |

| | | | |
|---|---|---|---|
| | KREYSZIG, E. | Advanced Engineering Mathematics | Wiley 2006 |
| | JAMES, G. | Modern Engineering Mathematics | Pearson 2002 |
| | THOMAS, G.B., WEIR, M.D., HASS, Joel, GIORDANO, F.R. | Thomas' Calculus | Addison Wesley 2005 |

Prepared by AMA Aug 2010. First revision: Oct 2010. Second revision: March 2011

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AMA2112 |
| **Subject Title** | Mathematics II |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite / Co-requisite/ Exclusion** | AMA2111 |
| **Objectives** | This subject is a continuation of AMA2111. It aims to introduce students to the basic principles and techniques of engineering mathematics. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical methods in solving practical problems in science and engineering. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>(a) apply mathematical reasoning to analyze essential features of different problems in science and engineering;<br>(b) extend their knowledge of mathematical and numerical techniques and adapt known solutions in various situations;<br>(c) develop and extrapolate the mathematical concepts in synthesizing and solving new problems<br>(d) demonstrate abilities of logical and analytical thinking;<br>(e) search for useful information in the process of problem solving. |
| **Subject Synopsis/ Indicative Syllabus** | *Multiple integrals*<br>Double and triple integrals, change of variables, applications to problems in geometry and mechanics.<br><br>*Vector calculus*<br>Vector and scalar fields, the del operator, line and surface integrals, the theorems of Green, Gauss and Stokes, applications to electromagnetic theory and fluid mechanics.<br><br>*Series expansion*<br>Infinite series, Taylor's expansion, Fourier series expansion of a periodic function.<br><br>*Partial differential equations*<br>Formulation of PDE of mathematical physics, separation of variables, initial-boundary value problems, introduction to Fourier transforms. |
| **Teaching/Learning** | The subject will be delivered mainly through lectures and tutorials. The lectures aim to provide the students with an integrated knowledge required for |

<table>
<tr><td>Methodology</td><td>the understanding and application of mathematical concepts and techniques. Tutorials will mainly be used to develop students' problem solving ability.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td></td></tr>
<tr><td>1.Homework, quizzes and mid-term test</td><td>40%</td><td>✓</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><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></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 engineering mathematics. 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>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>28 Hours</td></tr>
<tr><td>• Tutorial</td><td>14 Hours</td></tr>
<tr><td>• Mid-term test and examination</td><td></td></tr>
<tr><td>Other student study effort</td><td>5 hours</td></tr>
<tr><td>• Assignments and Self study</td><td>73 Hours</td></tr>
<tr><td>Total student study effort</td><td>120 Hours</td></tr>
</table>
</td></tr>
</table>

| | |
|---|---|
| **Reading List and References** | Chan, C.K. Chan, C.W. Hung, K.F., **Basic Engineering Mathematics** Updated 3rd edition**,** McGraw-Hill, 2011<br><br>Anton, H., **Elementary Linear Algebra**, Wiley 2000<br><br>Kreyszig, E. **Advanced Engineering Mathematics,** Wiley 2006<br><br>James, G., **Modern Engineering Mathematics**, Pearson 2002<br><br>Thomas, G.B., Weir, M.D., Hass, Joel., Giordano, F.R., **Thomas' Calculus,** Addison Wesley 2005 |

Prepared by AMA Aug 2010. First revision: Oct 2010. Second revision: March 2011

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AP00002 |
| **Subject Title** | Foundation Physics I |
| **Credit Value** | 3 |
| **Level** | 0 |
| **Pre-requisite/**<br><br>**Co-requisite/ Exclusion** | Nil |
| **Objectives** | To provide students with fundamental knowledge in physics focusing on the topics of mechanics and thermal physics. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) grasp a basic understanding in selected fundamental physical principles in mechanics and thermal physics;<br>(b) solve real-life problems based on the physical principles; and<br>(c) appreciate the importance of some physical principles as employed in various branches of engineering. |
| **Subject Synopsis/ Indicative Syllabus** | **Mechanics**: scalars and vectors; displacement, velocity and acceleration; motion along a straight line; projectile motion; Newton's laws of motions; addition and resolution of forces; work, energy and power; conservation of energy; momentum, impulse and collision; conservation of momentum.<br><br>**Thermal physics**: temperature and thermometer; heat and internal energy; heat capacity; change of state and latent heat; conduction, convection and radiation; evaporation; general gas law. |
| **Teaching/Learning Methodology** | **Lecture**: The fundamentals in mechanics and thermal physics will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. The students are free to request help. Homework problem sets will be given. The students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance.<br><br>**Student-centered Tutorial**: Students work on a set of problems in the tutorials. Students are encouraged to try to solve problems before seeking assistance. These problem sets provide them opportunities to apply the knowledge gained from the lecture. They also help the students consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to engineering science. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
|---|---|---|---|---|
| | | a | b | c |
| (1) Continuous assessment | 40 | ✓ | ✓ | ✓ |
| (2) Examination | 60 | ✓ | ✓ | ✓ |
| Total | 100 | | | |

Homework problem sets and tests (assessment method 1) and a final written examination (assessment method 2) all require demonstration of basic understanding of the relevant physics (a), good problem solving skills (b), and being able to relate the fundamental physics to engineering problems (c).

The continuous assessments aim at checking the progress of students study throughout the course, assisting them in self-monitoring of fulfilling the learning outcomes. The examination will be used to assess the knowledge acquired by the students; as well as to determine the degree of achieving the learning outcomes.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| • Lecture | 28 h |
| • Tutorial | 14 h |
| Other student study effort: | |
| • Self-study | 78 h |
| Total student study effort | 120 h |

**Reading List and References**

John D. Cutnell & Kenneth W. Johnson, **Introduction to Physics**, 9th edition, 2013, John Wiley & Sons.

Giambattista, Richardson and Richardson, **Physics**, 2nd edition, 2010, MaGraw-Hill.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AP00003 |
| **Subject Title** | Foundation Physics II |
| **Credit Value** | 3 |
| **Level** | 0 |
| **Pre-requisite/**<br><br>**Co-requisite/ Exclusion** | Nil |
| **Objectives** | To provide students with fundamental knowledge in physics focusing on the topics of waves and electromagnetism. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(d) grasp a basic understanding in selected fundamental physical principles in waves and electromagnetism;<br>(e) solve real-life problems based on the physical principles; and<br>(f) appreciate the importance of some physical principles as employed in various branches of engineering. |
| **Subject Synopsis/ Indicative Syllabus** | **Waves**: nature of waves; wave motion and propagation; longitudinal and transverse waves; reflection and refraction; superposition of waves; standing waves; diffraction and interference; sound waves; light in electromagnetic spectrum; reflection and refraction of light; total internal reflection; image formation by mirrors and lenses; wave nature of light.<br><br>**Electromagnetism**: electric charges; electric field and potential; current, potential difference and resistance; Ohm's law; series and parallel circuits; electrical power; magnetic force and magnetic field; magnetic effect of electric current; magnetic force on moving charges and current-carrying conductors; Hall effect; electromagnetic induction. |
| **Teaching/Learning Methodology** | **Lecture**: The fundamentals in waves and electromagnetism will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. The students are free to request help. Homework problem sets will be given. The students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance.<br><br>**Student-centered Tutorial**: Students work on a set of problems in the tutorials. Students are encouraged to try to solve problems before seeking assistance. These problem sets provide them opportunities to apply the knowledge gained from the lecture. They also help the students consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to engineering science. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
|---|---|---|---|---|
| | | a | b | c |
| (1) Continuous assessment | 40 | ✓ | ✓ | ✓ |
| (2) Examination | 60 | ✓ | ✓ | ✓ |
| Total | 100 | | | |

Homework problem sets and tests (assessment method 1) and a final written examination (assessment method 2) all require demonstration of basic understanding of the relevant physics (a), good problem solving skills (b), and being able to relate the fundamental physics to engineering problems (c).

The continuous assessments aim at checking the progress of students study throughout the course, assisting them in self-monitoring of fulfilling the learning outcomes. The examination will be used to assess the knowledge acquired by the students; as well as to determine the degree of achieving the learning outcomes.

**Student Study Effort Required**

| | |
|---|---|
| Class contact: | |
| • Lecture | 28 h |
| • Tutorial | 14 h |
| Other student study effort: | |
| • Self-study | 78 h |
| Total student study effort | 120 h |

**Reading List and References**

John D. Cutnell & Kenneth W. Johnson, **Introduction to Physics**, 9th edition, 2013, John Wiley & Sons.

Giambattista, Richardson and Richardson, **Physics**, 2nd edition, 2010, MaGraw-Hill.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AP10004 |
| **Subject Title** | Physics Experiments |
| **Credit Value** | 1 |
| **Level** | 1 |
| **Pre-requisite/**<br><br>**Co-requisite/ Exclusion** | Nil |
| **Objectives** | To provide the students with hands-on experience in the operation of various kinds of physical instruments and to apply their knowledge in physical principles for practical applications. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) apply the principles, methodologies and skills for experimental observation and interpretation for scientific and engineering purposes;<br><br>(b) analyze, evaluate, synthesize and propose solutions to problems of a general nature with innovative/creative ideas where appropriate; and<br><br>(c) to collaborate smoothly with others in teamwork. |
| **Subject Synopsis/ Indicative Syllabus** | Suggested Experiments:<br><br>1. Linear motion and Newton's Laws<br>2. Artwood's Machine and Kinetic Friction<br>3. Physical Pendulum<br>4. Specific Heat of objects<br>5. Ideal Gas Law<br>6. Heat Engine Cycle<br>7. Resonant Frequencies of a Tube and Standing Waves in a Tube<br>8. Inverse square law of waves<br>9. Interference from a Double-slit<br>10. Electrostatic system – variable capacitor<br>11. Force vs. Magnetic Field and Force vs. Angle<br>12. Electromagnetic induction – transformers |

<table>
<tr><td>Teaching/Learning Methodology</td><td>Laboratory: Twelve experiments will be conducted. They cover the whole range of fundamental physics, i.e. mechanics, heat, wave, light, and electromagnetism. Students will work in groups and conduct the experiments under the guidance of teaching staff. They are required to analyze their experimental results using basic physical principles. They also have to answer preset questions and complete laboratory reports before they leave the laboratory.</td></tr>
<tr><td>Assessment Method in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>Laboratory Reports</td><td>100</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100</td><td colspan="3"></td></tr>
</table>
<br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>Method 1 is designed to assess how the students can apply their knowledge and whether they can provide a solution to a practical problem, which are the learning outcomes of (a) and (b). It also encourages the students to work in groups, which is outcome (c).</td></tr>
<tr><td>Student Study Effort Required</td><td>
<table>
<tr><td>Class contact</td><td></td></tr>
<tr><td>• Laboratory</td><td>36 h</td></tr>
<tr><td>Total student study effort</td><td>36 h</td></tr>
</table>
</td></tr>
<tr><td>Reading List and Reference</td><td>John W. Jewett and Raymond A. Serway, “Physics for Scientists and Engineers”, 2010, 8th edition, Brooks/Cole Cengage Learning.<br><br>W. Bauer and G.D. Westfall, “University Physics with Modern Physics”, 2011, McGraw-Hill.</td></tr>
</table>

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AP10008 |
| **Subject Title** | University Physics I |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite/**<br><br>**Co-requisite/ Exclusion** | Nil |
| **Objectives** | This course provides a broad foundation in mechanics and thermal physics to those students who are going to study science, engineering, or related programmes. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) solve simple problems in single-particle mechanics using calculus and vectors;<br>(b) solve problems in mechanics of many-particle systems using calculus and vectors;<br>(c) define simple harmonic motion and solve simple problems;<br>(d) explain the formation of acoustical standing waves and beats;<br>(e) use Doppler's effect to explain changes in frequency received.<br>(f) explain ideal gas laws in terms of kinetic theory;<br>(g) apply the first law of thermodynamics to simple processes; and<br>(h) solve simple problems related to the Carnot cycle. |
| **Subject Synopsis/ Indicative Syllabus** | **Mechanics**: calculus-based kinematics, dynamics and Newton's laws; calculus-based Newtonian mechanics, involving the application of impulse, momentum, work and energy, etc.; conservation law; gravitation field; systems of particles; collisions; rigid body rotation; angular momentum; oscillations and simple harmonic motion; pendulum; statics; longitudinal and transverse waves; travelling wave; Doppler effect; acoustics.<br><br>**Thermal physics**: conduction, convection and radiation; black body radiation and energy quantization; ideal gas and kinetic theory; work, heat and internal energy; first law of thermodynamics; entropy and the second law of thermodynamics; Carnot cycle; heat engine and refrigerators. |

**Teaching/Learning Methodology**

**Lecture**: Fundamentals in mechanics, waves and electromagnetism will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. Students are free to request help. Homework problem sets will be given.

**Student-centered Tutorial**: Students will work on a set of problems in tutorials. Students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance. These problem sets provide them opportunities to apply their knowledge gained from the lecture. They also help the students to consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to daily life phenomena or experience.

**e-learning**: In order to enhance the effectiveness of teaching and learning processes, electronic means and multimedia technologies would be adopted for presentations of lectures; communication between students and lecturer; delivery of handouts, homework and notices etc.

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | f | g | h |
| (1) Continuous assessment | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| (2) Examination | 60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Total | 100 | | | | | | | | |

**Continuous assessment**:

The continuous assessment includes assignments, quizzes and test(s) which aim at checking the progress of students study throughout the course, assisting them in fulfilling the learning outcomes.

Assignments in general include end-of-chapter problems, which are used to reinforce and assess the concepts and skills acquired by the students; and to let them know the level of understanding that they are expected to reach.

At least one test would be administered during the course of the subject as a means of timely checking of learning progress by referring to the intended outcomes, and as means of checking how effective the students digest and consolidate the materials taught in the

<table>
<tr><td></td><td colspan="2">class.<br><br>Examination: This is a major assessment component of the subject. It would be a closed-book examination. Complicated formulas would be given to avoid rote memory, such that the emphasis of assessment would be put on testing the understanding, analysis and problem solving ability of the students.</td></tr>
<tr><td rowspan="6">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>• Lecture</td><td>36 h</td></tr>
<tr><td>• Tutorial</td><td>6 h</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>• Self-study</td><td>78 h</td></tr>
<tr><td>Total student study effort:</td><td>120 h</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Young and Freedman, (2007), University Physics, 12th edition, Pearson.<br><br>Bauer and Westfall, (2011), University Physics with Modern Physics, 1st edition, McGraw-Hill.</td></tr>
</table>

# Subject Description Form

| | |
|---|---|
| **Subject Code** | AP10009 |
| **Subject Title** | University Physics II |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite/**<br><br>**Co-requisite/ Exclusion** | Nil |
| **Objectives** | To provide students with fundamental knowledge in physics focusing on the topics of waves and electromagnetism. This course prepares students to study science, engineering or related programmes. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>(a) apply simple laws in optics to explain image formation;<br>(b) explain phenomena related to the wave character of light;<br>(c) define electrostatic field and potential;<br>(d) use Gauss' law in solving problems in electrostatics;<br>(e) solve problems on interaction between current and magnetic field;<br>(f) apply electromagnetic induction to various phenomena; and<br>(g) solve simple problems in AC circuits. |
| **Subject Synopsis/ Indicative Syllabus** | **Waves and optics**: nature of light, reflection and refraction; image formation by mirrors and lenses; compound lens; microscope and telescope; superposition of waves; Huygen's principle; interference and diffraction; interferometers and diffraction grating; polarization.<br><br>**Electromagnetism**: charge and Field; Coulomb's law and Gauss' law; electrostatic field and potential difference; capacitors and dielectric; current and resistance; Ohm's law; electromotive force, potential difference and RC circuits; magnetic force on moving charges and current; Hall effect; Biot-Savart law and Ampere's law; Faraday's law and Lenz's law; self-inductance and mutual inductance; transformers; AC circuits and applications. |

**Teaching/Learning Methodology**

**Lecture**: The fundamentals in optics and electromagnetism will be explained. Examples will be used to illustrate the concepts and ideas in the lecture. Students are free to request help. Homework problem sets will be given.

**Student-centered Tutorial**: Students will work on a set of problems in tutorials. Students are encouraged to solve problems and to use their own knowledge to verify their solutions before seeking assistance. These problem sets provide them opportunities to apply their knowledge gained from the lecture. They also help the students to consolidate what they have learned. Furthermore, students can develop a deeper understanding of the subject in relation to daily life phenomena or experience.

**e-learning**: In order to enhance the effectiveness of teaching and learning processes, electronic means and multimedia technologies would be adopted for presentations of lectures; communication between students and lecturer; delivery of handouts, homework and notices etc.

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | f | g |
| (1) Continuous assessment | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| (2) Examination | 60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Total | 100 | | | | | | | |

**Continuous assessment**:

The continuous assessment includes assignments, quizzes and test(s) which aim at checking the progress of students study throughout the course, assisting them in fulfilling the learning outcomes.

Assignments in general include end-of-chapter problems, which are used to reinforce and assess the concepts and skills acquired by the students; and to let them know the level of understanding that they are expected to reach.

At least one test would be administered during the course of the subject as a means of timely checking of learning progress by referring to the intended outcomes, and as means

| | | |
|---|---|---|
| | of checking how effective the students digest and consolidate the materials taught in the class.<br><br>**Examination:** This is a major assessment component of the subject. It would be a closed-book examination. Complicated formulas would be given to avoid rote memory, such that the emphasis of assessment would be put on testing the understanding, analysis and problem solving ability of the students. | |
| **Student Study Effort Expected** | Class contact: | |
| | • Lecture | 36 h |
| | • Tutorial | 6 h |
| | Other student study effort: | |
| | • Self-study | 78 h |
| | Total student study effort | 120 h |
| **Reading List and References** | J.W. Jewett and R.A. Serway, "Physics for Scientists and Engineers", Volume 2, 8th Edition, 2010, Cengage Learning.<br><br>W. Bauer and G.D. Westfall, "University Physics with Modern Physics", 2011, McGraw-Hill. | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | CBS0103P |
| **Subject Title** | Chinese Communication for Higher Diploma（高級文憑基礎中文課） |
| **Credit Value** | 3 |
| **Level** | 0 |
| **Pre-requisite / Co-requisite/ Exclusion** | Remarks: For students entering with the following HKDSE or HKALE results:<br>➢ HKDSE Level 2<br>➢ HKDSE Level 3 with any sub-score below Level 3<br>➢ HKALE Grade E with any component below E<br>➢ Below HKALE Grade E |
| **Objectives** | The subject aims to equip HD students with satisfactory language competence for general communications in Putonghua and in written modern Chinese. The training will enable the students to use Chinese in speech and in writing, to deal with social contacts and formal duties. The training would further form a basis for students to receive higher level training with emphasize on strategies, efficiency, varieties in the uses of Chinese language. |
| **Intended Learning Outcomes**<br>*(Note 1)* | Upon completion of the subject, students will be able to:<br>a. master the phonological system of Putonghua<br>b. listen to conversation, speech in Putonghua and make sensible responses<br>c. speak in Putonghua reasonably well for general communication<br>d. master the grammar, the issue of code-mixing in written Chinese<br>e. explain clearly and argue effectively in written Chinese<br>f. write practical Chinese for communication |
| **Subject Synopsis/ Indicative Syllabus**<br>*(Note 2)* | The training includes:<br>1. Introduction to the phonology system of Putonghua<br>2. A comparison between Cantonese and Putonghua<br>3. Speaking in Putonghua for expression and communication<br>4. Reading aloud short texts in Putonghua<br>5. Grammar in written Chinese<br>6. Code-mixing of Cantonese and English in written Chinese<br>7. Coherence in Chinese writing<br>8. Explanation and argumentation in written Chinese<br>9. Chinese practical writing |
| **Teaching/Learning Methodology**<br>*(Note 3)* | Lessons will be delivered in Putonghua. The subject will motivate the students' active participation by assigning group collaboration, individual presentation, and group discussion. Teaching materials will be presented in both printed mode and audio-visual mode. For the training of accuracy in written and spoken Chinese, students will be supplemented with materials in self-access manner. Teacher consultation will be offered to the students depending on individual need. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | f |
| 1. Listening & Reading Lexical, Sentence Expressions | 20% | √ | √ | √ | | | |
| 2. Reading Text and Speaking | 25% | √ | √ | √ | | | |
| 3. Basic Competence and Application of Written Chinese | 15% | | | | √ | √ | √ |
| 4. Explaining, Arguing and Communicating in Written Chinese | 30% | | | | √ | √ | √ |
| 5 Attendance & Participation | 10% | √ | √ | √ | √ | √ | √ |
| Total (Continuous Assessments) | 100 % | | | | | | |

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

The assessment methods for basic competence of Putonghua include (1) a set of assessing items that ask the students to read aloud in Putonghua, selected words of monosyllable, dissyllable, (2) one or two short text(s) on general topics, and (3) matching of vocabulary, sentence patterns, and phrasal expressions between Cantonese and Putonghua. For effective communication which focuses on the fluency and acceptability of students' Putonghua verbal expressions, the form of assessment will mainly be a face to face interaction between testee and tester, on topics of different social functions greeting, inviting, accepting, declining etc.

The assessment of written Chinese in this subject addresses three emphases: (1) to produce accurate Chinese writing in terms of Chinese characters, use of vocabulary and sentence pattern; (2) students' ability to write different genres in a different mood of delivery: ranging from intimate, general, formal and even frozen presentations, and (3) to be able to analyze, to synthesize and to evaluate facts and ideas in expository and argumentative texts. Therefore, students will be given writing tasks with specific background and details, and be asked to demonstrate their ability in these aspects.

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

| | | |
|---|---|---|
| **Student Study** | Class contact: | |

| | | |
|---|---|---|
| **Effort Expected** | | |
| | Seminar | 42 Hrs. |
| | ▪ | Hrs. |
| | Other student study effort: | |
| | ▪ Outside Class Exercise | 42 Hrs. |
| | ▪ Self-study | 42 Hrs. |
| | Total student study effort | 126 Hrs. |
| **Reading List and References** | Required (Putonghua)<br>1. 香港理工大學中國語文教學中心編（2005）《商貿普通話教程》（上冊）中華書局<br>2. 邢福義、汪國勝主編（2003）《現代漢語》 華中師範大學出版社<br><br>Reference<br>3. 路德慶主編(1982)《寫作教程》 華東師範大學出版社<br>4. 楊長進等編（1994）《商貿普通 9000 句》壹出版有限公司<br>5. 陳建民編著（1998）《普通話常用口語詞和句》香港普通話研習社<br>6. 陳瑞端著（2000）《生活錯別字》 中華書局<br>7. 于成鯤主編（2003）《現代應用文》 復旦大學出版社<br>8. 《現代漢語詞典（第 5 版）》（2005） 商務印書館 | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | CBS1101P |
| **Subject Title** | Fundamentals of Chinese Communication（大學中文傳意） |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite / Co-requisite/ Exclusion** | Remarks:<br>➢ Students whose HKDSE Chinese subject result is at Level 3 with two sub-scores below Level 3 should pass two credit-bearing Chinese Enhancement subjects, i.e. Speech Genres and Verbal Communication" and "Basic Writing Skills".<br>➢ Students entering with HKDSE Chinese subject result at Level 3 with one sub-score below Level 3 should pass one credit-bearing Chinese Enhancement subject, i.e. "Basic Writing Skills".<br>➢ Nil for students entering with HKDSE Chinese subject result at Level 3 or equivalent |
| **Objectives** | This subject aims to enhance and polish the communication skills of the students in both written Chinese and Putonghua for basic usage in the work-place. |
| **Intended Learning Outcomes**<br>*(Note 1)* | Upon completion of the subject, students will be able to:<br>(a) develop effective communication skills in both written Chinese and Putonghua required for basic usage in the work-place;<br>(b) master the format, organization, language and style of expression of various genres of Chinese practical writing such as official correspondences, publicity materials, reports and proposals;<br>(c) give formal presentation in Putonghua;<br>(d) engage with formal discussion in Putonghua. |
| **Subject Synopsis/ Indicative Syllabus**<br>*(Note 2)* | 1. Written Chinese for practical purposes<br>• Uses of words and sentences;<br>• Coherence in Chinese writing<br>• Format, organization, language and style of expression of official correspondences, publicity materials, reports and proposals;<br>• Context dependent stylistic variation<br>2. Formal Presentation in Putonghua<br>• The articulation in Putonghua |

<table>
<tr><td></td><td>
<ul><li>The flow of speaking</li><li>Choice of words, manner and gesture</li></ul>
3. Formal Discussion in Putonghua
<ul><li>Identification of main idea and key messages</li><li>Evaluation of relevancy of information in a message</li><li>Skills of seeking clarity/agree/disagreeing/answering to a question</li><li>Skills of summarizing</li></ul>
</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>The subject will be conducted in Putonghua, in highly interactive seminars. The subject 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 each genre designed for the syllabus for discussions and improvement; (2) modify passages in a given genre/style into other genres/styles for addressing different audiences and purposes; (3) give a power-point presentation in Putonghua in front of the whole class, then receive on spot feedback for discussion and improvement; then (4) prepare a written report/proposal on the same topic; and (5) engage in formal discussion in Putonghua on topics related to current issues and/or business operation; then (6) produce a written document on the same topic using a chosen genre.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Written Assignment</td><td>30%</td><td>√</td><td>√</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2. Oral Presentation</td><td>30%</td><td></td><td></td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>3. Final Examination</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>
Both written assignments and oral presentation will focus on the functions of communication and the adequacy of language used in authentic social settings. The examination emphasizes the correctness of expression and students' general competence in Chinese Language.<br><br>
Students obtaining a subject pass must pass both components, i.e. the continuous assessment and examination component of the subject. Students will get failure of the subject if he/she fails in either one of the two components.
</td></tr>
</table>

| | | |
|---|---|---|
| **Student Study Effort Expected** | Class contact: | |
| | ▪ Seminar | 42 Hrs. |
| | ▪ | Hrs. |
| | Other student study effort: | |
| | ▪ Outside Class Practice | 42 Hrs. |
| | ▪ Self-study | 42 Hrs. |
| | Total student study effort | 126 Hrs. |
| **Reading List and References** | 1. 路德慶主編 (1982)《寫作教程》，華東師範大學出版社<br>2. 邵守義（1991）《演講全書》，吉林人民出版社<br>3. 陳建民（1994）《說話的藝術》，語文出版社<br>4. 李軍華（1996）《口才學》，華中理工大學出版社<br>5. 陳瑞端著（2000）《生活錯別字》，中華書局<br>6. 邢福義、汪國勝主編（2003）《現代漢語》，華中師範大學出版社<br>7. 于成鯤主編（2003）《現代應用文》，復旦大學出版社<br>8. 李白堅、丁迪蒙（2004）《大學體型寫作訓練規程》，上海大學出版社<br>9. 鍾文佳（2004）《漢語口才學》，西南師範大學出版社<br>10. 于成鯤、陳瑞端、秦扶一、金振邦主編（2011）《當代應用文寫作規範叢書》，復旦大學出版社 | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | CBS1102P |
| **Subject Title** | Advanced Communication Skills in Chinese（高階中文傳意） |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite / Co-requisite/ Exclusion** | Remarks: For students entering with HKDSE Chinese subject result at Level 4 and 5 or equivalent |
| **Objectives** | This subject aims to develop effective communication skills of students in both spoken and written Chinese which are required for the business and professional setting. |
| **Intended Learning Outcomes**<br>*(Note 1)* | Upon completion of the subject, students will be able to:<br>(a) develop effective communication skills in both spoken and written Chinese required for in the business and professional setting;<br>(b) master the format, organization, language and style of expression of the following genres of Chinese practical writing: argumentative and persuasive writing, public speech;<br>(c) give public speech;<br>(d) produce creative writing. |
| **Subject Synopsis/ Indicative Syllabus**<br>*(Note 2)* | 1. Written Chinese for Practical Purposes<br>• Uses of words and sentences, choice of diction;<br>• Coherence and thread of thinking in Chinese writing<br>• Context dependent stylistic variation<br>• Format, organization, language and style of expression of speeches, argumentative & persuasive writing;<br>2. Public Speech<br>• Contextual elements: the audiences, the purpose and the topic<br>• Identification of key points and collection of supporting information<br>• Articulation and flow of speaking<br>• Choice of words, manner and gesture<br>• Using of visual aids<br>• Handling of question and answer session<br>3. Creative Writing<br>• Understanding of the features of creative writing<br>• Being able to appreciate the arts of writing |

**Teaching/Learning Methodology**

*(Note 3)*

The subject will be conducted in highly interactive seminars. The subject 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 each genre designed for the syllabus for discussions and improvement; (2) modify passages in a given genre/style into other genres/styles for addressing different audiences and purposes; (3) prepare a script for public speaking; (4) give a public speech in front of the whole class, then receive on spot feedback for discussion and improvement; and (5) engage in formal discussion on topics related to current issues and/or business operation that require persuasive and argumentative skills; then (6) produce an argumentative article on the same topic.

**Assessment Methods in Alignment with Intended Learning Outcomes**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
| 1. Prose Writing | 20% | √ | √ | | | | |
| 2. Written Draft for Formal Speech | 10% | √ | √ | √ | | | |
| 3. Formal Speech | 10% | √ | √ | √ | | | |
| 4. Feature Article | 20% | √ | √ | | √ | | |
| 5. Class Participation | 10% | √ | √ | √ | √ | | |
| 6. Final Examination | 30% | √ | √ | √ | √ | | |
| Total | 100 % | | | | | | |

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

Both written assignments and oral presentation will focus on the functions of communication and the adequacy of language used in authentic social settings. The examination emphasizes the correctness of expression and students' general competence in Chinese Language.

Students obtaining a subject pass must pass both components, i.e. the continuous assessment and examination component of the subject. Students will get failure of the subject if he/she fails in either one of the two components.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| ▪ Seminar | 42 Hrs. |
| ▪ | Hrs. |
| Other student study effort: | |
| ▪ Outside Class Practice | 42 Hrs. |

| | | |
|---|---|---|
| | ▪ Self-study | 42 Hrs. |
| | Total student study effort | 126 Hrs. |
| **Reading List and References** | 1. 路德慶主編(1982)《寫作教程》，華東師範大學出版社<br>2. 邵守義（1991）《演講全書》，吉林人民出版社<br>3. 陳建民（1994）《說話的藝術》，語文出版社<br>4. 李軍華（1996）《口才學》，華中理工大學出版社<br>5. 陳瑞端著（2000）《生活錯別字》，中華書局<br>6. 于成鯤主編（2003）《現代應用文》，復旦大學出版社<br>7. 邢福義、汪國勝主編（2003）《現代漢語》，華中師範大學出版社<br>8. 李白堅、丁迪蒙（2004）《大學體型寫作訓練規程》，上海大學出版社<br>9. 鍾文佳（2004）《漢語口才學》，西南師範大學出版社<br>10. 于成鯤、陳瑞端、秦扶一、金振邦主編（2011）《當代應用文寫作規範叢書》，復旦大學出版社 | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE2002C |
| **Subject Title** | Circuit Analysis |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite** | Nil |
| **Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. Introduce fundamental circuit theory.<br>2. Develop ability for solving problems involving electric circuits.<br>3. Develop skills for experimentation on electric circuits. |
| **Intended Learning Outcomes** | **Upon completion of the subject, students will be able to:**<br><br>Category A: Professional/academic knowledge and skills<br><br>1. Acquire a good understanding of fundamental circuit theory.<br>2. Solve simple problems in electric circuits.<br>3. Use suitable instrumentation to carry out experimental investigations to validate the theoretical investigations. |
| **Subject Synopsis/ Indicative Syllabus** | **Syllabus:**<br><br>1. DC Circuits<br><br>Introduction to electric circuits. Voltage and current as two basic variables. Kirchhoff's current and voltage laws. Independent and dependent sources. Simple circuit styles: voltage divider, current divider, series and parallel circuits. Nodal and mesh analyses. Thévenin and Norton theorems. Power dissipation. Source loading and maximum power transfer.<br><br>2. Capacitance, Inductance and First Order Transients<br>Constitutive relations of capacitor and inductor. Introduction to time-varying circuits. Simple RC and LC circuits. Important concept of independent state variables. First-order differential equation (with simple solution of exponential form). First order transient analysis. Time-domain solution and transient behaviour of first order circuits.<br><br>3. Mutual Inductance and Transformer |

<table>
<tr><td></td><td colspan="3">Basic coupled inductance equation. Concept of ideal transformer (assuming sinusoidal voltages and currents). Dot convention. Physical transformer as ideal transformer with leakage and magnetizing inductances. Applications in galvanic isolation and voltage/current level conversion.<br><br>4. <u>Steady-state Analysis of AC Circuits</u><br>Average and rms values. Phasors (rotating vectors). Steady-state analysis of circuits driven by single fixed frequency sinusoidal sources. Impedance and admittance. Analysis approach 1: phasor diagrams for simple circuits. Analysis approach 2: systematic complex number analysis, i.e., same treatment as DC circuits but with complex numbers representing phase and magnitude of AC voltages and currents. Real and reactive powers. Power factor. Three-phase circuits.<br><br>5. <u>Electrical Measurement</u><br>Measurement uncertainties. Resistance measurement: Four-probe measurement and Wheatstone Bridge. Capacitance and inductance measurement using AC Bridges. Power Measurement. Measuring three-phase power by two-wattmeter method.<br><br>Laboratory Experiments:<br><br>1. Introduction to laboratory instrumentation / Thévenin and Norton theorems<br><br>2. First order transient<br><br>3. Transformer tests and characteristics.</td></tr>
<tr><td>Teaching/ Learning Methodology</td><td>Lectures, supplemented with interactive questions and answers, and short quizzes</td><td>1, 2</td><td>In lectures, students are introduced to the knowledge of the subject, and comprehension is strengthened with interactive Q&A and short quizzes.</td></tr>
<tr><td></td><td>Tutorials, where problems are discussed and are given to students for them to solve</td><td>1, 2</td><td>In tutorials, students apply what they have learnt in solving the problems given by the tutor.</td></tr>
<tr><td></td><td>Laboratory sessions, where students will perform experimental verifications. They will</td><td>2, 3</td><td>Students acquire hands-on experience in using electronic equipment and apply</td></tr>
</table>

| | | | |
|---|---|---|---|
| | have to record results and write a report on one of the experiments. | | what they have learnt in lectures/tutorials to experimentally validate the theoretical investigations. |
| | Assignment and Homework | 1, 2 | Through working assignment and homework, students will develop a firm understanding and *comprehension* of the *knowledge* taught. |

**Alignment of Assessment and Intended 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 (Total 40%) | | | | | |
| • Assignments | 10% | ✓ | ✓ | | ✓ |
| • Laboratory works and reports | 10% | | ✓ | ✓ | ✓ |
| • Mid-semester test | 10% | ✓ | ✓ | | ✓ |
| • End-of-semester test | 10% | ✓ | ✓ | | ✓ |
| 2. Examination | 60% | ✓ | ✓ | | ✓ |
| Total | 100% | | | | |

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

| | | |
|---|---|---|
| | **Specific Assessment Methods/Tasks** | **Remark** |
| | Assignment/Homework | Assignments/Homeworks are given to students to assess their competence level of *knowledge* and *comprehension*. The criteria (i.e. *what* to be demonstrated) and level (i.e. the *extent*) of achievement will be graded according to six levels: (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 works and reports | Students will be required to perform three experiments and submit a report on one of the experiments. Expectation and grading criteria will be given as in the case of assignment/homework. |
| | Mid-semester test | There will be a mid-semester test to evaluate students' achievement of all the learning outcomes and give feedback to them for prompt improvement. Expectation and grading criteria will be given as in the case of assignment/homework. |
| | End-of-semester test and Examination | There will be an end-of-semester test and examination to assess students' achievement of all the learning outcomes. These are mainly summative in nature. Expectation and grading criteria will be given as in the case of assignment/homework. |

| | | |
|---|---|---|
| **Student Study Effort Expected** | **Class contact (time-tabled):** | |
| | ▪ Lecture | 28 Hours |
| | ▪ Tutorial | 14 Hours |
| | ▪ Laboratory | 9 Hours |
| | **Other student study effort:** | |
| | ▪ Revision and Assignments | 28 Hours |
| | ▪ Tutorial | 14 Hours |
| | ▪ Report Writing | 12 Hours |
| | **Total student study effort:** | 105 Hours |
| **Reading List and References** | **Textbook:**<br>1. G. Rizzoni, Fundamentals of Electrical Engineering, First Edition, New York: McGraw-Hill, 2009. | |

| | |
|---|---|
| | **References:**<br><br>1. W.H. Hayt, J.E. Kemmerly and S.M. Durbin, Engineering Circuit Analysis, 7th ed., New York: McGraw-Hill, 2006.<br>2. R.A. DeCarlo and P.M. Lin, *Linear Circuit Analysis*, 2nd ed., Oxford University Press, 2001.<br>3. A.H. Robbins and W.C. Miller, *Circuit Analysis: Theory and Practice*, Thomson Learning, 4th ed., 2007.<br>4. |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE2003C |
| **Subject Title** | Electronics |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite** | Circuit Analysis (EE2002C) |
| **Co-requisite/ Exclusion** | Nil |
| **Objectives** | To introduce the operating principles of electronic devices and circuits. Several fundamental classes of electronic devices and circuits will be covered, including diodes and diode circuits, bipolar junction transistor (BJT) and amplifiers, metal-oxide-semiconductor field-effect transistor (MOSFET) and amplifiers, and operational amplifiers. An introduction to frequency domain analysis will also be given. |
| **Intended Learning Outcomes** | **Upon completion of the subject, students will be able to:**<br><br>Category A: Professional/academic knowledge and skills<br><br>1. Acquire some understanding in several fundamental classes of electronic devices.<br>2. Solve basic problems in electronic devices and circuits.<br>3. Acquire better skills in performing laboratory experiments.<br><br>Category B: Attributes for all-roundedness<br><br>4. Perform independent learning in the basic operating principles of electronic devices and circuits.<br>5. Work as a team in laboratory sessions. |
| **Subject Synopsis/ Indicative Syllabus** | **Syllabus:**<br><br>1. Diodes and Diode Circuits<br>Semiconductor basics. P-N junction basics. Input, output and transfer characteristics of practical diodes. Biasing through load line concept. Practical diode circuits: rectifier circuits, clipping and clamping circuits.<br><br>2. Transistors and Biasing Circuits<br><br>Bipolar junction transistor (BJT). DC biasing and analysis of BJT circuits. Metal-oxide-semiconductor field-effect transistor (MOSFET). DC biasing and analysis of MOSFET circuits. Load line and graphical large-signal |

analysis. Transistor amplification concept.

3. Transistor Amplifiers and Small-signal Concepts
Basic BJT and MOSFET amplifier configurations: common emitter and common source configurations. Small-signal models and parameters. Concept of transconductance. Voltage gain. Input and output impedances. Introduction to loading effect.

4. Operational Amplifiers
Ideal operational amplifier. Defining characteristics (i.e., infinite gain and infinite input resistance). Basic op-amp circuits: inverting amplifier, non-inverting amplifier, summing amplifier, difference amplifier, integrating amplifier and differentiating amplifier. Specific op-amp circuits: instrumentation amplifier; current-to-voltage converter and voltage-to-current converter. Design applications.

5. Introduction to Frequency Domain Analysis
Transfer functions from ac circuits in terms of j$\omega$. Introduction to frequency domain, from j$\omega$ to $s$. General $s$-domain transfer functions. Simple first-order filter circuits. Concepts of pole, corner frequency and bandwidth. Use of j$\omega$ axis for magnitude and phase plots for sinusoidal driving sources. Extension to asymptotic plots and Bode plots.

**Laboratory Experiments:**

1. DC transistor biasing/load line and diode clamping circuits.
2. Design of a small-signal common-emitter amplifier.
3. Use of operational amplifiers.

**Teaching/ Learning Methodology**

| | | |
|---|---|---|
| Lectures, supplemented with interactive questions and answers | 1, 2, 4 | In lectures, students are introduced to the *knowledge* of the subject, and *comprehension* is strengthened with interactive Q&A. |
| Tutorials, where problems are discussed and are given to students for them to solve | 1, 2, 4 | In tutorials, students *apply* what they have learnt in solving the problems given by the tutor. |
| Laboratory sessions, where students will perform experimental verifications. They will | 2, 3, 5 | Students *acquire* hands-on experience in using electronic equipment and *apply* |

| | | | |
|---|---|---|---|
| | have to record results and write a report on one of the experiments. | | what they have learnt in lectures/tutorials to experimentally validate the theoretical investigations. |
| | Assignments | 1, 2, 3, 4 | Through working assignments, students will develop a firm understanding and *comprehension* of the *knowledge* taught. |

**Alignment of Assessment and 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. Continuous Assessment | 40% | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Examination | 60% | ✓ | ✓ | | ✓ | |
| Total | 100% | | | | | |

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

| **Specific Assessment Methods/Tasks** | **Remark** |
|---|---|
| Assignments | Assignments are given to students to assess their competence level of *knowledge* and *comprehension*. The criteria (i.e. *what* to be demonstrated) and level (i.e. the *extent*) of achievement will be graded according to six levels: (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 is given. Feedback about their performance will be given promptly to students to help them improvement their learning. |
| Laboratory works and reports | Students will be required to perform three experiments and submit a report on one of the experiments. Expectation and grading criteria will be given as in the case of assignments. |
| Mid-semester test | There will be a mid-semester test to evaluate students' achievement of all the learning |

| | | |
|---|---|---|
| | | outcomes and give feedback to them for prompt improvement. Expectation and grading criteria will be given as in the case of assignments. |
| | End-of-semester test and Examination | There will be an end-of-semester test and examination to assess students' achievement of all the learning outcomes. These are mainly summative in nature. Expectation and grading criteria will be given as in the case of assignments. |

| | | |
|---|---|---|
| **Student Study Effort Expected** | **Class contact (time-tabled):** | |
| | ▪ Lecture | 28 Hours |
| | ▪ Tutorial | 14 Hours |
| | ▪ Laboratory | 12 Hours |
| | **Other student study effort:** | |
| | ▪ Revision | 28 Hours |
| | ▪ Tutorial & Assignments | 15 Hours |
| | ▪ Laboratory logbook & report writings | 8 Hours |
| | **Total student study effort:** | 105 Hours |

**Reading List and References**

**Textbook:**

2. Donald A. Neamen, *Microelectronics: Circuit Analysis and Design*, 3rd ed., Boston: McGraw-Hill, 2006.

**References:**

5. G. Rizzoni, *Principles and Applications of Electrical Engineering*, Fifth Edition, New York: McGraw-Hill, 2006.
6. W.H. Hayt, J.E. Kemmerly and S.M. Durbin, *Engineering Circuit Analysis,* 7th ed., New York: McGraw-Hill, 2006.
7. A.H. Robbins and W.C. Miller, *Circuit Analysis: Theory and Practice*, Thomson Learning, 4th ed., 2006.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE2004C |
| **Subject Title** | Electrical Energy Systems Fundamentals |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. To provide an overview of the supply, utilisation and control of electrical energy<br>2. To introduce energy and environmental issues, and assist students in placing these topics and technologies in perspective. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a. To master the fundamental knowledge on electrical power systems.<br>b. To identify, analyze, and solve technical problems using of mathematics and engineering techniques.<br>c. To be aware of equipment characteristics and environment issues on the modern electrical power system.<br>d. To have the ability to work independently, and in teams when conducting laboratory work. |
| **Subject Synopsis/ Indicative Syllabus** | 1. ***Nature of electrical energy system***: Power system layout, transmission and distribution structure, role of transformers. The interconnected power system. HVDC transmission. Layout of a substation, distribution structure, overhead lines and cables, circuit breaking, overvoltage protection, protection concepts.<br>2. ***Generation, energy & environment***: Principles of energy conversion, power plant and busbar layout, types of generators and turbines. Concept of generation control and operating chart. Pumped storage and wind turbine. Renewable and non-renewable sources. Sources of pollution and environmental impacts. Sustainable development.<br>3. ***Transformers***: Construction & operating principles. 3φ winding connections & phase grouping. Equivalent circuits. Voltage regulation & efficiency parallel operation.<br>4. ***Line & cables***: Overhead line construction including transposition and bundling. Primary (RLCG) and general (ABCD) parameter calculations. Line equations and performance charts. Corona loss and interference. Cable types and construction including void formation and cross bonding. Electrical stress calculation. Thermal characteristics.<br>5. ***Rotating electrical machines***: Basic operating principles d.c. machines, induction motors and synchronous machines. |

**Laboratory Experiment:**

Typical Titles

1. Experiments on single phase transformer
2. Experiments on three phase transformer
3. Computer exercises on transmission line parameters calculations

**Case study:**

Typical titles

1. Discuss the environmental impacts of nuclear power generation.
2. Discuss the environmental impacts of fossil fuel power generation.
3. Discuss the environmental impacts on the development of large scale hydropower station like the Three Gorges project.
4. Explain why modern electric power systems are often interconnected.
5. Discuss the renewable energy sources which may be used in Hong Kong.

**Teaching/Learning Methodology**

Lectures and tutorials are used to convey the basic concepts and knowledge, to teach students the skills to identify, analyze, and solve technical problems, and to provide students feedback in relation to their learning.

Laboratory experiments and case studies are designed, as supplement to the lecturing materials, for students to gain practical experiences and be aware of equipment characteristics and environment issues on the modern electrical power system.

| Teaching/Learning Methodology | Outcomes | | | |
|---|---|---|---|---|
| | a | b | c | d |
| Lectures | √ | √ | √ | |
| Tutorials and case studies | √ | √ | √ | |
| Experiments | | | √ | √ |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Examination | 60% | √ | √ | √ | | | | | | | | |
| 2. Class tests | 20% | √ | √ | | | | | | | | | |
| 3. Lab performance and report | 10% | | | | √ | | | | | | | |
| 4. Assignments/case study | 10% | √ | √ | √ | | | | | | | | |
| | | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | | |

The outcomes on concepts, design and applications are assessed by examinations and tests whilst those on analytical skills, problem solving techniques and practical considerations of electrical energy systems, as well as team work and technical report writing abilities are evaluated by lab performance and reports, and assignments/case study reports.

| **Student Study Effort Expected** | | |
|---|---|---|
| | Class contact: | |
| | ▪ Lecture/Tutorial | 36 Hrs. |
| | ▪ Laboratory | 12 Hrs. |
| | Other student study effort: | |
| | ▪ Self-study and assignments | 47 Hrs. |
| | ▪ Case study | 10 Hrs. |
| | Total student study effort | 105 Hrs. |

**Reading List and References**

**Textbooks:**

1. Electric Power Systems – B.M. Weedy, Wiley, 3rd edition or later, 1988 or later
2. Elements of Power System Analysis – William D. Stevenson, Jr., McGraw Hill, 4th edition or later, 1982 or later

**Reference books:**

1. Power System Analysis – Hadi Saadat, McGraw Hill, 1999
2. Power System Analysis – Arthur R. Bergen, Vijay Vittal, Prentice Hakk, 2nd edition, 2000

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE2007C |
| **Subject Title** | Computer System Fundamentals |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. To enable students to establish a broad knowledge of the organization and components included in a small computer system.<br>2. To enable students to understand and apply assembly language programming.<br>3. To enable students to develop a simple embedded computer system |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a. Given specifications of an application and the instruction set of the microprocessor, design an assembly program to carry out the necessary operations.<br>b. Appreciate advanced features of the latest microprocessors and understand functions of basic computer peripherals.<br>c. Given a set of conditions, design a basic computer system.<br>d. Think logically and be able to present results in writing. |
| **Subject Synopsis/ Indicative Syllabus** | **Computer Systems Hardware and Operations**<br>1. ***Processor operation and internal architecture*****:** Operations of data registers, buses and data path, operations of ALU, arithmetic hardware, and general pipeline architecture. Introduction to structure and operation of a modern microprocessor.<br>2. ***Memory organization*****:** Characteristics of current memory technologies. Memory hierarchies and memory decoding mechanism.<br>3. ***Input and output systems*****:** Direct I/O system and memory mapped I/O; handshaking control, programmed I/O; interrupt and polling mechanisms. Protocol for serial data communications.<br>4. ***Microprocessor hardware and interfacing*****:** System bus organization and interfacing techniques, CPU bus timing, system bus structure, design of input/output system. Interface and operations of LSI chips applied in a computer system including: interrupt controller, timer, UART and PIO.<br>**Assembly Language Programming** |

5. ***Memory addressing space and data representation*:** Internal registers of 8086, Addressing modes in 8086 soft-ware model.

6. ***Assembly language program*:** Basic elements of an assembly language program, instruction mnemonics and directives, arithmetic operations and logical operations.

7. ***Programming techniques*:** Arithmetic manipulations, elementary programming constructs, parameter passing, data initialisation.

8. ***Coding and debugging*:** Conversion of source programs to machine codes, use of software debugging monitor, Compilation of assembly source program, linking of object files.

**Laboratory Experiment:**

Perform basic input/output operations of a microcontroller by assembly language programming.

Speed control of a DC motor using a microcontroller and assembly language programming.

**Teaching/Learning Methodology**

Lectures and tutorials are the primary means of conveying the basic concepts and theories. Experiences on design, practical applications and programming are given through experiments, in which the students are expected to solve design problems with real-life constraints and to attain feasible solutions with critical and analytical thinking. Interactive laboratory sessions are introduced to encourage better preparation and hence understanding of the experiments. On-the-spot assessments are conducted in the laboratory to provide additional incentives for student learning. Experiments are designed to supplement the lecturing materials, especially in assembly language programming, so that the students are encouraged to take extra readings and to look for relevant information.

| Teaching/Learning Methodology | Outcomes | | | |
|---|---|---|---|---|
| | a | b | c | d |
| Lectures and tutorials | √ | √ | √ | |
| Tutorials | √ | √ | √ | |
| Experiments | √ | | | √ |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Examination | 60% | √ | √ | √ | | | | | | | | |
| 2. Class Test | 15% | √ | √ | | | | | | | | | |
| 3. Laboratory performance & report | 10% | √ | | | √ | | | | | | | |
| 4. Programming test | 15% | √ | | √ | √ | | | | | | | |
| | | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | | |

It is a fundamental computer architecture subject. The outcomes on concepts, design and applications are assessed by the usual means of examination and test whilst those on analytical skills, problem-solving techniques and practical considerations of programming, as well as technical reporting are evaluated by experiments, and the report.

| **Student Study Effort Expected** | | |
|---|---|---|
| | Class contact: | |
| | ▪ Lecture/Tutorial | 36 Hrs. |
| | ▪ Laboratory | 12 Hrs. |
| | Other student study effort: | |
| | ▪ Laboratory preparation/report | 12 Hrs. |
| | ▪ Self-study | 45 Hrs. |
| | Total student study effort | 105 Hrs. |

**Reading List and References**

**Textbooks:**

1. B.B. Brey, The Intel Microprocessors Architecture, Programming, and Interfacing. 8th Edition, Prentice Hall, 2008
2. K.R. Irvine, Assembly Language for Intel-Based Computers, 5th Edition, Prentice Hall, 2006

**Reference books:**

1. A.K. Ray, Advanced Microprocessors & Peripherals, McGraw-Hill, 2006
2. R.J. Tocci and F.J. Ambrosio, Microprocessors and Microcomputers: Hardware and Software, 6th Edition, Prentice Hall, 2003
3. W.A. Triebel and A. Singh, The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 4th Edition, Prentice Hall, 2003

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE2008C |
| **Subject Title** | Group Project |
| **Credit Value** | 4 |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Pre-requisite: The student should completed most of the subjects required in previous year of the programme before taking this subject. The enrollment of this subject is subjected to the approval of the Project Coordinator |
| **Objectives** | 1. To ensure students have an opportunity to apply specialised theoretical knowledge together with practical skill to an identified engineering problem, to solve them and to communicate what is achieved orally and in a report.<br>2. To ensure student to work effectively and efficiently in a team for a technical project (students are normally grouped into teams of three.) |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a. To apply specialized knowledge.<br>b. To identify key engineering problems, to solve them and to communicate what is achieved orally and in a written report.<br>c. To develop a project which is sufficiently challenging.<br>d. To monitor the progress of project from concept to final implementation and testing, through problem definition.<br>e. To synthesize and apply their knowledge, analytical and practical skills gained in various disciplines<br>f. To build team spirit, confidence and develop professionalism by successfully completing the project. |
| **Subject Synopsis/ Indicative Syllabus** | **Choice of Project**<br>Projects are expected to be proposed by the students. They may also be proposed by academic members of staff, or jointly by student and staff. Industrial experience and staff research and consultancy activities are fertile ground for ideas. Project proposals must include an objective, describe the method of approach, describe any innovative features, and provide an estimate of cost.<br>The suitability of a proposal may be judged by factors such as its intellectual level, level of difficulty in technical aspects, relevance to the aims of the Programme, practicality in terms of time, funding and availability of resources.<br>**Project Plan**<br>At the beginning of the project, students are required to submit a clear project plan (formal project proposal). The plan should not be too long but should cover such matters |

as:

- problem identification statements
- brief literature survey, background theory
- suggested methods to solve the problem
- division outline of hardware and software
- preliminary time schedule
- cost estimate

**Interim Progress Report**

A progress report submitted between the end of the 1st semester and the start of the 2nd semester, when students produce a summary of their progress to date. This gives the supervisor a more formal opportunity than at discussions to indicate his assessment of student progress and to eliminate discrepancies if necessary. Problem cases are brought to the notice of the project coordinator by supervisors.

**Final Project Report**

A good project schedule includes adequate time for preparing a report of the appropriate standard. The final report should be submitted before the examination period. These will be given to the Assessment Panel (see Assessment below) for understanding of the student's work and for assessment purposed. To ensure that the project reports are prepared properly and of appropriate standard, student groups must first submit a draft of the report to the supervisor for comments before final submission.

At the end of the project, each project is assessed by an Assessment Panel of three members, including a Chairman, an independent examiner and the project Supervisor. The Chairman and the independent examiner should have sufficient knowledge of the subject area, so as to form an independent opinion of the technical merit of the project and to independently assess achievements.

The Project Supervisor will provide information on student's progress, initiative and ability to work independently. The Supervisor will also be in a position to contribute views on the student's technical achievement. All members of the Assessment Panel will read the project report before the assessment meeting. The Assessment Panel will reach their decision after:

- listening to the student's presentation,
- examining him orally on his work, and
- seeing a demonstration of the project's outcome.

**Assessment**

In assessing the project, the panel will consider, normally with equal weight, the following aspects:

a. Intellectual achievement;
b. Depth of understanding of the topic and the relevant allied topics;
c. Quantity and quality of work done, including design and construction of equipment, experimentation, mathematical models, program writing, verification;
d. Presentation including the written report, seminar presentation and response to questions.

The Chairman will ensure that all aspects of the study are thoroughly discussed by the

Panel before arriving at a consensus on an overall grade to be awarded to the project. In arriving at their decision, the Panel will bear in mind their experiences in respect of the achievements in other projects in the Department in the current and previous years.

If no consensus arises as to the overall grade to be awarded to the project, each panel member (i.e. the Chairman, the project supervisor and the independent examiner) will independently award grades to the project on an assessment form with written justification for their grades. A grade from the Assessment Panel will then be derived by averaging (with the same weight) the conversion marks for the grades given by the three academics constituting the Assessment Panel.

**Method of Assessment: 100% continuous assessment**

**I. Formal Project Proposal**

Students are required to submit a formal project proposal when the project is started. One hardcopy is required. The length of the proposal should be limited to 6 pages, excluding appendix, if any. **This will contribute to 5% of the final grade.**

The contents of the proposal should include:

A. Aims of the project
B. Proposed specifications of the product (no matter it is a hardware or software project)
C. Summary of the literature search done up-to-date.
D. Proposed approach/methodology to be used
E. Some brief descriptions on the theory of the approach/methodology
F. Time table / schedule of your work of the entire project

**Assessment Criteria**

*1. Literature review.*
*2. Problem definition.*
*3. Writing quality.*

**II. The Interim Progress Report**

Students are also required to submit an interim progress report at about the middle of project duration. Two hardcopies are required. The length of the proposal should be limited to 12 pages, excluding appendix, if any. **This will contribute to 15% of the final grade.**

The contents of the progress report should include:

A. Aims of the project (especially any change from the original aims).
B. Brief outline of the theory.
C. Work that has been carried out up to the date.
D. The system design and the block diagram of the system, plus some brief descriptions on the theory.
E. Difficulties encountered and the measures taken to solve them.
F. Proposed time table / schedule for the rest of the work up to the end of the project.
G. Difficulties expected in the coming period.

**Assessment Criteria**

*1. Method: alternatives and feasibility.*
*2. Design / Implementation / Results.*
*3. Project management.*
*4. Writing quality.*

**III. The Final Report**

In writing a report it is advisable to form a framework for the report first. You may start with the formation of the titles of the chapters. Then you proceed on to decide the titles and structure of the sections within each chapter. Continuing the process, each section may be further expanded into appropriate sub-sections, divisions and sub-divisions etc., until a complete framework is formed. **The final report will contribute to 50% of the final grade.**

The content of the final report includes:

A. Aims of the project (especially any change from the original aims).
B. The motivation behind the project and a brief outline of the project work.
C. A summary of work done or developed in the project (not work done by others).
D. The system design and the block diagram of the system, plus some brief descriptions on the theory.
E. Testing and simulation results.
F. Comments on results obtained.
G. Difficulties encountered and the measures taken to solve them.
H. The achievement of the project, the conclusions from the work and suggestions for further work.
I. Materials which are closely related to the contents of the report, and which are themselves self-contained, may be included in the report as appendixes.
J. A list of the references referred to the source of information in the report. This is compulsory.

**Assessment Criteria**

1. *Problem identification.*
2. *Conceptual clarity and accuracy.*
3. *Technical approach used.*
4. *Literature search*
5. *Writing quality and format of report*

**IV. The Presentation and Demonstration**

The student should keep the presentation concise and interesting through good use of visual aids and multimedia, logic flow of ideas, and appropriate control of the pace. Show good mastering of topics and avoid undue pauses. The student should be able to elaborate on technical details in answering questions. Good pronunciation and intonation are desirable. Be courteous during the presentation.

Hardware must be neatly built and laid out and there is good engineering sense in hardware implementation. Circuits / software should function properly, and experiments should be able to support fulfillment of project objectives.

**The presentation and demonstration will contribute to 30% of the final grade.**

**Assessment Criteria**

1. *Problem identification.*
2. *Conceptual clarity and accuracy.*
3. *Technical methodology.*
4. *Successfulness of the demonstration.*

*5. Fluency and confidence in presentation and demonstration.*

**Note 1:** Each project group has to submit/carry out all the above four components before he/she is considered to pass the FYP.

**Note 2:** The final grade for the FYP will be calculated by taking the weighted average of the grades from the above four components.

**Note 3:** Although it is a group project, different grades may be awarded to different members of the group if it is found that contributions from different members vary significantly.

**Teaching/Learning Methodology**

As the nature of the subject implies, there will not be many formal lectures in the subject, other than a few of hours of briefings on general information, some official procedures in administration of the project and some techniques on information/ components searching. Students learn the technical contents by a substantial number of individual discussions with their project supervisors and a large number of hours of self-learning. The planning of the project will be carried under the direction of the supervisor. Through the execution of the project plan with guidance from the supervisor, the student should be able to achieve the learning outcomes.

| Teaching/Learning Methodology | Outcomes | | | | | |
|---|---|---|---|---|---|---|
| | a | b | c | d | e | f |
| Discussion with the project Supervisor | √ | | √ | | | |
| Wiring of the project proposal | √ | √ | √ | | √ | |
| Writing of the interim report | √ | √ | √ | √ | √ | |
| Writing of the final report | √ | √ | √ | √ | √ | √ |
| Presentation and demonstration | | √ | | | | √ |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | f | | | | |
| 1. Formal project proposal | 5% | | √ | √ | | | | | | | |
| 2. Interim progress report | 15% | | √ | √ | √ | | | | | | |
| 3. Final report | 50% | √ | √ | √ | √ | √ | √ | | | | |
| 4. Presentation and demonstration | 30% | √ | √ | | | | √ | | | | |
| | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | |

Assessment criteria for each of the above assessment methods are as listed in one of above sections.

| | | |
|---|---|---|
| **Student Study Effort Expected** | Class contact: | |
| | ▪ Briefings | 3 Hrs. |
| | ▪ Individual Discussions with supervisor | ~12 Hrs. |
| | Other student study effort: | |
| | ▪ Information search, self study | |
| | ▪ Execution of the project, report writing, preparation of presentation | ~100 Hrs. |
| | Total student study effort | 120 Hrs. |
| **Reading List and References** | Nil | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE3002C |
| **Subject Title** | Electromechanical Energy Conversion |
| **Credit Value** | 3 |
| **Level** | 3 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. To provide students a general knowledge on common types of electric machines.<br>2. To provide students the basic techniques of steady-state electric machine analysis. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a. Explain the construction, operating principles, performance characteristics, control and applications of transformers and major types of rotating electric machines.<br>b. Analyse the steady-state performance of electric machines using appropriate equivalent circuit models.<br>c. Operate practical electric machines and to conduct relevant tests and experiments.<br>d. Present results of electric machine studies in the form of tables, graphs, and written reports. |
| **Subject Synopsis/ Indicative Syllabus** | 1. ***Introduction*****:** Principles of motors and generators. Materials for electric machines. Types of electric machines and applications. Losses and efficiency.<br>2. ***Machine rating*****:** Temperature rise and cooling methods. Heating and cooling curves. Thermal ratings. Machine nameplate.<br>3. ***Transformers:*** Operating principles. Equivalent circuits. Voltage regulation and efficiency. Parallel operation. Three-phase transformers and phase grouping.<br>4. ***Windings*****:** Phase and commutator windings. Winding factors. E.m.f. equation. Harmonics. Production of rotating field.<br>5. ***D.C. machines*****:** Construction. E.m.f equation. Armature reaction and commutation. Characteristics of shunt, series and compound machines. Testing. Speed control. Universal motor. Brushless d.c. motor.<br>6. ***Synchronous machines*****:** Construction. Synchronous impedance. Voltage regulation. Synchronising. Performance on infinite busbars. Power/load angle relationship. Stability. Synchronous motor.<br>7. ***Induction machines*****:** Squirrel cage and wound-rotor types. Equivalent circuit. Torque-slip relationship. Starting, braking and generating. Testing. Speed control. |

Single-phase induction motors.

**Laboratory Experiments:**

Load test, efficiency and speed control of a d.c. motor.

Performance evaluation of a three-phase cage induction motor.

Synchronous motor V-curves.

Temperature rise and ratings.

**Teaching/Learning Methodology**

Delivery of the subject is mainly through formal lectures and complemented by tutorials. Excel programmes are used to clarify concepts of electric machines learnt and for conducting 'what-if' analysis. Laboratory work provides students hands-on experience in operation and control of practical machines, while report-writing enables students to practise written and graphic presentation skills.

| Teaching/Learning Methodology | Outcomes | | | |
|---|---|---|---|---|
| | a | b | c | d |
| Lectures | √ | √ | √ | |
| Tutorials | √ | √ | | |
| Laboratory work | | √ | √ | √ |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | | | | | |
| 1. Examination | 60% | √ | √ | √ | √ | | | | | | |
| 2. Tests | 20% | √ | √ | √ | | | | | | | |
| 3. Laboratory work and reports | 15% | | √ | √ | √ | | | | | | |
| 4. Assignment | 5% | √ | √ | | | | | | | | |
| | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | |

It is a fundamental subject on electric machines and transformers. The outcomes on concepts, operating principles and applications are assessed by the usual means of

| | | |
|---|---|---|
| | assignment, tests, and examination. The outcomes on practical operation of electric machines and technical communication are evaluated by laboratory work and reports. | |
| **Student Study Effort Expected** | Class contact: | |
| | ▪ Lecture/Tutorial | 36 Hrs. |
| | ▪ Laboratory | 12 Hrs. |
| | Other student study effort: | |
| | ▪ Revision, self-study, and assignment | 48 Hrs. |
| | ▪ Write-up of laboratory reports | 9 Hrs. |
| | Total student study effort | 105 Hrs. |
| **Reading List and References** | **Reference books:**<br><br>1. C.G. McPherson and R.D. Laramore, An Introduction to Electrical Machines and Transformers, 2nd Edition, NY: John Wiley and Sons, 1990<br><br>2. S.A. Nasar, Schaum's Outline of Electric Machines and Electromechanics. NY: Macmillan Publishing Company, 1998 | |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE3003C |
| **Subject Title** | Power Electronics and Drives |
| **Credit Value** | 3 |
| **Level** | 3 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. To understand the characteristics and operation of power electronics devices.<br>2. To expose the students to the conversion and utilization of large amount of electrical power using latest power semiconductor devices and modern control techniques.<br>3. To ensure the students develop an understanding of various drive systems. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will:<br>a. Be able to explain both verbally and in written form major semiconductor devices that can be used as switches, and their electrical characteristics which include basic idealised models as well as extension to some important non-ideal characteristics.<br>b. Be able to explain the processes of efficient energy conversion through the use of power semiconductor switches.<br>c. Be able to apply the concepts of switching power conversion to analyse a variety of circuits including:<br>i. DC to DC conversion<br>ii. AC to DC conversion<br>iii. DC to AC conversion<br>d. Be able to present the results of study and experiments in the form of a technical report. |
| **Subject Synopsis/ Indicative Syllabus** | 1. ***Power electronics fundamentals*****:** power conversion, energy balance principle, review of fundamentals.<br>2. ***Power semiconductor devices*****:** Diodes**,** Power Transistor, MOSFET, SCR, GTO, IGBT, switching characteristics.<br>3. ***DC-DC converters*****:** Buck, Boost and Buck-Boost DC-DC Converter, Duty Cycle Controller, Switched Mode Power Supply.<br>4. ***AC-DC rectifiers*****:** Uncontrolled and controlled single-phase and three-phase |

rectifiers, terminal characteristics, supply and load interactions.

5. ***DC/AC inverters*:** Basic Single-phase bridge inverters, voltage and frequency control, harmonic reduction.

6. ***Electric drive systems*:** Introduction to electric drives system, applications for conservation of energy, dc electric drives.

**Laboratory Experiment:**

DC/DC Buck Converter, Introduction to SCR circuits, PSPICE simulation of SCR Bridge.

**Teaching/Learning Methodology**

Lectures and tutorials are effective teaching methods:

1. To provide an overview or outline of the subject.
2. To introduce new concepts and knowledge to the students.
3. To explain difficult ideas and concepts of the subject.
4. To motivate and stimulate students interest.
5. To provide students feedback in relation to their learning.
6. To encourage students responsibility for their learning by extra reference books reading and computer-based circuit simulations.

Laboratory works is an essential ingredient of this subject:

1. To supplement the lecturing materials.
2. To add real experience for the students.
3. To provide deep understanding of the subject.
4. To enable students to organise principle and challenge ideas.

| Teaching/Learning Methodology | Outcomes | | | |
|---|---|---|---|---|
| | a | b | c | d |
| Lectures | √ | √ | √ | |
| Tutorials | √ | √ | √ | |
| Experiments | | | | √ |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | | | | | |
| 1. Examination | 60% | √ | √ | √ | | | | | | | |
| 2. Class tests | 30% | √ | √ | √ | | | | | | | |
| 3. Laboratory performance & reports | 10% | | | √ | √ | | | | | | |
| | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | |

The understanding on theoretical principle and practical considerations, analytical skills and problem solving technique will be evaluated. Examination, class tests, laboratory sections and reports are an integrated approach to validly assess students' performance with respect to the intended subject learning outcomes.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| ▪ Lecture/Tutorial | 36 Hrs. |
| ▪ Laboratory | 12 Hrs. |
| Other student study effort: | |
| ▪ Laboratory preparation/report | 12 Hrs. |
| ▪ Self-study | 45 Hrs. |
| Total student study effort | 105 Hrs. |

**Reading List and References**

**Textbooks:**

1. Ned. Mohan, Tore M. Undeland, William P. Robbins, Power Electronics: Converters, Applications & Design, 3rd Edition, Wiley, 2003
2. Muhammad H. Rashid, Power Electronics: Circuits, Devices and Applications, 3rd Edition, Prentice Hall, 2004

**Reference books:**

1. Bimal K. Bose, *Power Electronics and Variable Frequency Drives: Technology and Applications,* IEEE Press 1997
2. Philip T. Krein, *Elements of Power Electronics,* Oxford University Press, 1998
3. R. Krishnan, *Electric Motor Drives: Modeling, Analysis, and Control,* Prentice-Hall, 2001
4. Ned. Mohan, *Electric Drives: an Integrative Approach,* Minnesota Power Electronics Research & Education, 2003

| | |
|---|---|
| | 5. P.C. Sen, *Principles of Electric Machines and Power Electronics, 2nd Edition, W*iley, 1996<br>6. W. Shepherd, *Power Electronics and Motor Control, 2nd Edition,* Cambridge University Press, 1996 |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | EE3009C |
| **Subject Title** | Electrical Services in Buildings |
| **Credit Value** | 3 |
| **Level** | 3 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1. To enable students to understand the major design features, operating characteristics and functions of electrical and electronic equipment used in building services.<br>2. To enable students to implement technical data, regulations, standards and guidance notes prepared by statutory bodies in the design of reliable, safe and efficient electrical power distribution, lightning protection, vertical transportation, lighting and fire fighting systems in buildings. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will:<br>a. Be able to plan efficient, safe and high quality distribution systems for domestic, commercial and industrial buildings.<br>b. Be proficient to assess the suitability of different vertical transportation systems and fire fighting systems for a building.<br>c. Be able to design and evaluate the effectiveness of lightning protection systems.<br>d. Be able to integrate the lighting requirements and operating characteristics of light sources to the design of interior lighting and exterior lighting.<br>e. Be able to search for information in solving technical problems. |
| **Subject Synopsis/ Indicative Syllabus** | 1. ***Power distribution in buildings*****:** System planning. Incoming supply arrangement for domestic, commercial and industrial installations. Economics of HV/LV distributions. Tariffs, maximum demand, load factors and diversity. Earthing systems. Applications of standby generator sets and uninterruptible power supplies.<br>2. ***Requirements for safe design*****:** Overview of Supply Rules and Regulations. Electric shock, overcurrent and earth fault protection. Fuse, MCB, MCCB, ACB design and selection criteria. Co-ordination of protection systems. Cable and wiring systems design.<br>3. ***Interference and power quality*****:** Installation requirements, grouping, interference, noise suppression and power supply in communication systems. Electromagnetic compatibility. Harmonics and voltage dips issues. |

4. ***Lightning protection systems*:** Lightning phenomena. Estimation of exposure risk. Requirements for system components. Standards for protection of structures against lightning.

5. ***Vertical transportation systems*:** Lift. Hoist and escalator drives. Safety requirements and drive characteristics. Grade of service and round trip time.

6. ***Lighting*:** Characteristics of light sources. Classification of luminaries. Lighting control. Interior lighting design. Glare index calculation. Colour rendering. Utilisation of daylight. Exterior lighting design.

7. ***Fire Fighting Systems*:** Outline, regulations, requirements and components of fire fighting systems. Fire sprinkler systems. Heat and smoke detector systems. BTM/BCF systems.

**Case Study:**

1. Distribution systems design for typical buildings in Hong Kong
2. Applications of Overcurrent and earth fault protection
3. Co-ordination of various types of protective devices
4. Electrical power quality issues in building services
5. Lightning protection systems design
6. Interior lighting and exterior lighting designs
7. Fire protection for domestic, commercial and industrial buildings

**Teaching/Learning Methodology**

In lectures and tutorials, materials that emphasize practical problem-solving methods are balanced with materials that emphasize fundamental understanding. Students are expected to take initiative to learn through the process of engagement and participation in lectures and tutorial sessions. Practical designs used in industry, where appropriate, are discussed interactively in class. Mini-Projects are used to enhance students learning experiences and practical applications. They provide students with the opportunity to develop independent design/planning and technical report writing skills pertinent to the field of electrical services in buildings.

| Teaching/Learning Methodology | Outcomes | | | | |
|---|---|---|---|---|---|
| | a | b | c | d | e |
| Lectures | √ | √ | √ | √ | |
| Tutorials | √ | √ | √ | √ | |
| Mini-projects | √ | √ | √ | √ | √ |

**Assessment Methods in Alignment with Intended Learning**

| Specific assessment | % | Intended subject learning outcomes to be |
|---|---|---|

**Outcomes**

| methods/tasks | weighting | assessed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | | | | | |
| 1. Examination | 60% | √ | √ | √ | √ | | | | | | |
| 2. Class Test/Quiz | 25% | √ | √ | √ | √ | | | | | | |
| 3. Mini-project & report | 15% | √ | √ | √ | √ | √ | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Total | 100% | | | | | | | | | | |

The subject outcomes on planning, design, effectiveness evaluation of electrical services in buildings are assessed by means of examination, quizzes and tests. The outcomes on engineering skills, applications, problem solving techniques, as well as technical writing, are evaluated by mini-project and reports.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| ▪ Lecture/Tutorial | 42 Hrs. |
| | |
| Other student study effort: | |
| ▪ Mini-project discussion/report | 20 Hrs. |
| ▪ Self-study | 43 Hrs. |
| Total student study effort | 105 Hrs. |

**Reading List and References**

**Textbooks and Reference books:**

1. R. Barrie, Design of Electrical Services for Buildings, Spon Press, 4th Edition, 2005
2. G. Stokes, Handbook of Electrical Installation Practice, Blackwell Scientific Publication, 4th Ed., 2003
3. G.C. Barney, Elevator Traffic Handbook: Theory and Practice, Spon Press, 2003
4. J.R. Coaton, Lamps and Lighting, Wiley, 1997
5. F. Hall, Building Services Handbook, Butterworth-Heinemann, 4th Edition, 2007
6. D.C. Pritchard, Lighting, Longman, 6th Edition 1999

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC0011 |
| **Subject Title** | English Communication Skills I |
| **Credit Value** | 3 |
| **Level** | 0 |
| **Pre-requisite / Co-requisite/ Exclusion** | NIL |
| **Objectives** | This subject aims to help higher diploma students entering with (i) HKDSE English Language Level 2; (ii) HKDSE English Language Level 3 with any sub-score below Level 3; (iii) HKALE Use of English Grade E with any component below E; or (iv) below HKALE Use of English Grade E, to study effectively in the University's English medium learning environment, and to improve and develop their English language proficiency for study purposes. |
| **Intended Learning Outcomes** *(Note 1)* | Upon successful completion of the subject, students will be able to:<br>a. organise and deliver effective oral presentations<br>b. use writing functions appropriately in short texts<br>c. plan and write effective expository essays<br><br>To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, and present information logically and coherently. |
| **Subject Synopsis/ Indicative Syllabus** *(Note 2)* | 1. Spoken communication<br>Planning, organising and delivering oral presentations; identifying and practising a range of verbal and non-verbal interaction strategies in oral presentations; differentiating between spoken and written communication in English, especially in tertiary study contexts; using visual aids effectively; handling questions. |

| | |
|---|---|
| | 2. Written communication<br><br>Identifying a range of text types and sentence structures; using common writing functions, such as classification, exemplification and cause and effect; improving the writing of topic sentences and strategies for paragraph development; improving coherence and cohesion in writing; understanding structural features and common patterns of organisation in expository writing; expressing views logically and coherently; understanding the style and tone of writing at university level.<br><br>3. Language and study skills development<br><br>Improving and extending relevant features of grammar, vocabulary and pronunciation; extending skills for taking effective notes from written and spoken sources, such as university lectures. |
| **Teaching/Learning Methodology**<br>*(Note 3)* | 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 make use of elearning resources and web-based work to improve their grammar and vocabulary.<br><br>Learning materials developed by the English Language Centre are used throughout the course. Students are referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials are recommended as required. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
|---|---|---|---|---|
| | | a | b | c |
| 1. Oral presentation | 30% | ✓ | | |
| 2. Writing a short text | 30% | | ✓ | ✓ |
| 3. Writing an expository essay | 40% | | ✓ | ✓ |
| Total | 100 % | | | |

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

Assessment 1 evaluates students' achievement of LO (a), and focuses on students' application of accurate and appropriate language and effective non-verbal strategies. Assessments 2 and 3 require students to demonstrate their achievement of LOs (b) and (c) through the use of appropriate writing functions in a short text and a longer expository essay.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| ▪ Seminars | 42 Hrs. |
| Other student study effort: | |
| ▪ Self study/preparation | 84 Hrs. |
| Total student study effort | 126 Hrs. |

**Reading List and References**

*Course material*

Learning materials developed by the English Language Centre

*Recommended references*

Boyle, J. & Boyle, L. (1998). *Common Spoken English Errors in Hong Kong*. Hong Kong: Longman.

Chivers, B. and Shoolbred, M. (2007). *A student's guide to presentations: Making your presentation count*. Los Angeles; London: Sage.

Hung, T. T. N. (2005). *Understanding English grammar: A course book for Chinese learners of English*. Hong Kong: Hong Kong University Press.

Redman, S. (2003). *English vocabulary in use: Pre-intermediate and intermediate*. Cambridge: Cambridge University Press.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC0012 |
| **Subject Title** | English Communication Skills II |
| **Credit Value** | 3 |
| **Level** | 0 |
| **Pre-requisite / Co-requisite/ Exclusion** | ELC0011 English Communication Skills I |
| **Objectives** | This subject aims to help higher diploma students entering with (i) HKDSE English Language Level 2; (ii) HKDSE English Language Level 3 with any sub-score below Level 3; (iii) HKALE Use of English Grade E with any component below E; or (iv) below HKALE Use of English Grade E, to study effectively in the University's English medium learning environment, and to improve and develop their English language proficiency for study and work purposes. |
| **Intended Learning Outcomes** *(Note 1)* | Upon successful completion of the subject, students will be able to:<br>a. participate actively in group discussions<br>b. use appropriate tone and style in workplace related written communication<br>c. write effective short reports<br><br>To achieve the above outcomes, students are expected to use language and text structure appropriate to the context, and present information logically and coherently. |
| **Subject Synopsis/ Indicative Syllabus** *(Note 2)* | 1. Spoken communication<br>Using appropriate verbal strategies for interaction in discussions, including strategies for turn taking and expressing opinions; applying non-verbal interaction strategies in discussions<br><br>2. Written communication<br>Understanding the nature, purpose and audience of workplace-related reports; understanding the principles and techniques of style; using modern workplace- |

<table>
<tr><td></td><td>related style; creating user-friendly documents; adopting appropriate tone; organising texts; improving paragraph development; maintaining coherence and cohesion; expressing ideas logically and coherently.<br><br>3. Language development<br><br>Improving and extending relevant features of grammar, vocabulary and pronunciation.</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>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 make use of elearning resources and web-based work to improve their grammar and vocabulary, and other language skills.<br><br>Learning materials developed by the English Language Centre are used throughout the course. Students are referred to learning resources on the Internet and in the ELC's Centre for Independent Language Learning. Additional reference materials are recommended as required.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Group discussion</td><td>40%</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Writing workplace-oriented texts</td><td>30%</td><td></td><td>✓</td><td></td></tr>
<tr><td>3. Writing a short report</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:<br><br>Assessment 1 evaluates students' achievement of LO (a), and focuses on students' application of accurate and appropriate language and effective non-verbal strategies. Assessments 2 and 3 require students to demonstrate their achievement of LOs (b) and (c) through the use of appropriate organisation, language, style and tone in short texts and a short report.</td></tr>
</table>

| | | |
|---|---|---|
| **Student Study Effort Expected** | Class contact: | |
| | ▪ Seminars | 42 Hrs. |
| | Other student study effort: | |
| | ▪ Self study/preparation | 84 Hrs. |
| | Total student study effort | 126 Hrs. |
| **Reading List and References** | *Course material*<br>Learning materials developed by the English Language Centre<br>*Recommended references*<br>Bullock, R. & Weinberg, F. (2011) *The Little Seagull handbook* .New York, N.Y.: W.W. Norton & Co.<br>Parker, G. M. & Hoffman, R. (2006). *Meeting excellence: 33 tools to lead meetings that get results.* San Francisco, CA: Jossey-Bass. | |

# 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 grammar, vocabulary, pronunciation and fluency. |
| **Intended Learning Outcomes**<br>*(Note 1)* | Upon successful completion of the subject, students will be able to:<br>a. use a variety of strategies to comprehend meaning and messages of a range of written and spoken texts<br>b. organise and write accurate and coherent short texts<br>c. use appropriate verbal and non-verbal skills in spoken communication in a variety of contexts<br>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**<br>*(Note 2)* | 1. Written communication<br><br>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.<br><br>2. Spoken communication<br><br>Developing verbal and non-verbal interaction strategies appropriate to the context and level of formality.<br><br>3. Reading and listening<br><br>Understanding the content and structure of information delivered in written and spoken texts; developing effective reading and listening strategies; and using study tools such as dictionaries to obtain lexical and phonological information.<br><br>4. Language development<br><br>Improving and extending relevant features of grammar, vocabulary, pronunciation and fluency. |
| **Teaching/Learning Methodology**<br>*(Note 3)* | 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.<br><br>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**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
|---|---|---|---|---|
| | | a | b | c |
| 1. In-class tests | 55% | ✓ | ✓ | |
| 2. Oral assessment | 15% | ✓ | | ✓ |
| 3. Out-of-class assessed work | 30% | ✓ | ✓ | ✓ |
| Total | 100 % | | | |

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

The in-class tests, which assess students' grammar and vocabulary and their ability to write short texts in accurate and appropriate grammatical structures, necessitate achievement of LOs (a) and (b). The oral assessment assesses students' ability to speak accurately, appropriately and confidently. Students will need to read and organise information from a variety of sources, and present the information using strategies appropriate to the context for the spoken communication (ref. LOs (a) and (c)). The out-of-class assessed work evaluates students' ability to research a topic and present it as a digital story, both as a written script and a spoken commentary (ref all LOs).

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 | 42 Hrs. |
| Other student study effort: | |
| ▪ Self-study/preparation | 84 Hrs. |
| Total student study effort | 126 Hrs. |

| | |
|---|---|
| **Reading List and References** | *Course material*<br><br>Learning materials developed by the English Language Centre<br><br>*Recommended references*<br><br>Boyle, J. & Boyle, L. (1998). *Common Spoken English Errors in Hong Kong*. Hong Kong: Longman.<br><br>Brannan, B. (2003). *A writer's workshop: Crafting paragraphs, building essays*. Boston: McGraw-Hill.<br><br>Hancock, M. (2003). *English pronunciation in use*. Cambridge: Cambridge University Press.<br><br>Nettle, M. and Hopkins, D. (2003). *Developing grammar in context: Intermediate*. Cambridge: Cambridge University Press.<br><br>Redman, S. (2003). *English vocabulary in use: Pre-intermediate and intermediate*. Cambridge: Cambridge University Press. |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC1012/ELC1013 |
| **Subject Title** | English for University Studies<br>(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 5 from the HKDSE will be exempted from this subject. They can proceed to Advanced English for University Studies (ELC1014). |
| **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 Learning Outcomes**<br>*(Note 1)* | Upon successful completion of the subject, students will be able to:<br>a. refer to sources in written texts and oral presentations<br>b. paraphrase and summarise materials from written and spoken sources<br>c. plan, write and revise expository essays with references to sources<br>d. deliver effective oral presentations<br><br>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**

*(Note 2)*

1. Written communication

Analysing and practising common writing functions; improving the ability of writing topic sentences and strategies for paragraph development; understanding common patterns of organisation in expository writing; taking notes from written and spoken sources; practising summarising 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 practising 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**

*(Note 3)*

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**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | | |
|---|---|---|---|---|---|
| | | a | b | c | d |
| 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 (a), (b) and (c) 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 synthesise from a variety of sources, and refer to those sources in their presentation (ref. LOs (a), (b) and (d)).

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. They require students to critically read and summarise information contained in a variety of sources, as required in LOs (a) and (b).

| **Student Study Effort Expected** | | |
|---|---|---|
| | Class contact: | |
| | ▪ Seminars | 42 Hrs. |
| | Other student study effort: | |
| | ▪ Self study/preparation | 84 Hrs. |
| | Total student study effort | 126 Hrs. |

**Reading List and References**

*Course material*

Learning materials developed by the English Language Centre

*Recommended references*

Comfort, J. (2001). *Effective presentations.* Oxford: Cornelsen & Oxford University Press.

Hung, T. T. N. (2005). *Understanding English grammar: A course book for Chinese learners of English*. Hong Kong: Hong Kong University Press.

McWhorter, K. T. (2012). *The successful writer's handbook*. (2nd ed.). Boston: Longman.

Zwier, L. J. (2002). *Building academic vocabulary.* Ann Arbor, MI: University of Michigan Press.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC1014 |
| **Subject Title** | Advanced English for University Studies |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite / Co-requisite/ Exclusion** | Pre-requisite: English for University Studies (ELC1012/ELC1013) (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 Learning Outcomes** *(Note 1)* | Upon successful completion of the subject, students will be able to:<br>a. use sources appropriately and effectively in written and spoken presentations<br>b. plan, write and revise discursive essays with appropriate referencing to sources<br>c. present views effectively and critically in spoken communication<br><br>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** *(Note 2)* | 1. Written communication<br>Developing logical and persuasive arguments; applying a variety of organisation patterns in discursive writing, including the writing of explanatory and evaluative texts; selecting information critically; supporting stance; maintaining cohesion and coherence in discursive writing; achieving appropriate style and tone. |

<table>
<tr><td></td><td>2. Spoken communication<br><br>Enhancing and practising the specific oral and aural skills required to participate effectively in academic discussions and to present views in a formal academic context.<br><br>3. Reading and listening<br><br>Understanding the content and structure of information in oral and written texts; comprehending, inferring and evaluating messages and attitude.<br><br>4. Language development<br><br>Improving and extending relevant features of grammar, vocabulary and pronunciation.</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>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.<br><br>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.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</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>a</th><th>b</th><th>c</th></tr>
<tr><td>1. Discursive essay (draft)</td><td>20%</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Discursive essay (final)</td><td>35%</td><td>✓</td><td>✓</td><td></td></tr>
</table>
</td></tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | 3. Academic discussion | 25% | ✓ | | ✓ |
| | 4. Formal academic presentation | 20% | ✓ | | ✓ |
| | Total | 100 % | | | |

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

Assessments 1 and 2 assess the students' abilities in producing a coherent academic text which requires effective use and referencing of sources (ref. LOs (a) and (b)). Assessments 3 and 4 assess their abilities to plan and present their ideas, in two different academic contexts (ref. LOs (a) and (c)).

In addition to these assessments, students are required to complete further language training through working on their ePortfolio throughout the course. This will involve students in reading texts and subsequent online writing and discussion that will parallel the process writing approach involved in assessments 1 and 2, and align with all three LOs.

| **Student Study Effort Expected** | | |
|---|---|---|
| | Class contact: | |
| | ▪ Seminars | 42 Hrs. |
| | Other student study effort: | |
| | ▪ Self study/preparation | 84 Hrs. |
| | Total student study effort | 126 Hrs. |

**Reading List and References**

*Course material*

Learning materials developed by the English Language Centre

*Recommended references*

Faigley, L. (2008). Backpack writing: Reflecting, arguing, informing, analyzing, evaluating. New York, NY: Pearson/Longman.

Madden, C. and Rohlck, T. N. (1997). *Discussion and interaction in the academic community*. Ann Arbor, MI: University of Michigan Press.

Oshima, A. & Hogue, A. (2006). *Writing academic English* (4th ed.). White Plains, NY: Pearson/Longman.

Reinhart, S. M. (2002). *Giving academic presentations.* Ann Arbor, MI: University of Michigan Press.

Wood, N. V. (2009). *Perspectives on argument* (6th ed). Upper Saddle River, NJ: Pearson/Prentice Hall.

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC2011 |
| **Subject Title** | Advanced English Reading and Writing Skills |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite / Co-requisite/ Exclusion** | Pre-requisite: Advanced English for University Studies (ELC1014) |
| **Objectives** | This subject aims to help students become more effective readers. It focuses on developing students' facility to read a variety of texts in a critical manner, and to be able to discuss the stance of the writer as well as their own reflective response to a text. |
| **Intended Learning Outcomes** *(Note 1)* | Upon successful completion of the subject, students will be able to examine a variety of texts, including literary texts, and:<br>a. identify salient ideas and implications, and distinguish unsupported claims from supported ones, and fallacies from valid arguments<br>b. produce critical or interpretative texts which discuss and evaluate texts and writer positions<br>c. write and discuss critical responses to various texts<br>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** *(Note 2)* | 1. Reading strategies<br>Reading intensively to investigate a particular topic and develop an in-depth understanding of issues and stances; reading critically to extract implications, distinguish fact from opinion and fallacies from valid arguments, and to identify writers' assumptions and purposes; analysing issues raised in texts written from different perspectives, including literary texts; reading extensively to appreciate the use of language, acquire information, promote understanding and develop empathy.<br>2. Writing strategies<br>Presenting views and arguments to educated readers; describing and analysing the structure, meaning and characteristics of a variety of texts; discussing writer intentions. |

**Teaching/Learning Methodology**

*(Note 3)*

The study method is primarily seminar-based. Following a blended learning approach, activities include teacher input as well as in- and out-of-class individual and group work involving drafting and evaluating texts, mini-presentations and discussions. 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**

*(Note 4)*

| Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) | | |
|---|---|---|---|---|
| | | a | b | c |
| 1. Reflective writing | 20% | | | ✓ |
| 2. Analysing texts written in different styles and from various perspectives | 40% | ✓ | | ✓ |
| 3. Writing a feature article | 40% | ✓ | ✓ | ✓ |
| Total | 100% | | | |

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

Assessment 1 requires students to write reflective responses to texts and/or books they have read, and is aligned with LO (c). Assessments 2 and 3 assess LO (a) and involve students employing effective critical reading and thinking skills. Assessment 3 requires students to conduct library/online search and produce a critical text, thus integrating the receptive critical reading skills with the production of a written text which critically assesses the texts they have read. All three assessments assess students' abilities with regard to LO (c) but in different ways, and require students to present and support their interpretation of their reading.

**Student Study Effort Expected**

| | |
|---|---|
| Class contact: | |
| ▪ Seminars | 42 Hrs. |
| Other student study effort: | |
| ▪ Self study/preparation | 84 Hrs. |
| Total student study effort | 126 Hrs. |

| | |
|---|---|
| **Reading List and References** | *Course material*<br><br>Learning materials developed by the English Language Centre<br><br>*Recommended references*<br><br>Best, J. (2001). *Damned lies and statistics: Untangling numbers from the media, politicians, and activists.* Berkeley, CA: University of California Press.<br><br>Cooper, S. & Patton, R. (2010). *Writing logically, thinking critically.* New York, NY: Longman.<br><br>Damer, T. E. (2009). *Attacking faulty reasoning: A practical guide to fallacy-free arguments.* Belmont, CA: Wadsworth Cengage Learning.<br><br>Kennedy, X. J. & Gioia, D. (2010). *Literature: An introduction to fiction, poetry, drama, and writing* (11th ed.). New York, NY: Longman.<br><br>Mefcalfe, M. (2006). *Reading critically at university.* Thousand Oaks, CA: Sage. |

# Subject Description Form

| | |
|---|---|
| **Subject Code** | ELC2012 |
| **Subject Title** | Persuasive Communication |
| **Credit Value** | 3 |
| **Level** | 2 |
| **Pre-requisite / Co-requisite/ Exclusion** | Pre-requisite: Advanced English for University Studies (ELC1014) |
| **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 Learning Outcomes** *(Note 1)* | Upon successful completion of the subject, students will be able to<br>a. write persuasive texts intended for a variety of audiences<br>b. communicate persuasively in oral presentations<br>c. make persuasive arguments in formal discussions<br><br>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** *(Note 2)* | 1. Preparing for effective persuasion<br>Assessing the situation; selecting relevant content; organising ideas and information; selecting an appropriate tone, distance and level of formality; using appropriate visual imagery to support the communication of messages.<br><br>2. Persuasion through writing<br>Developing and practising appropriate language, tone, style and structure; achieving cohesion and coherence.<br><br>3. Persuasion through speaking<br>Developing and practising appropriate verbal and non-verbal skills for |

<table>
<tr><td></td><td>persuasive oral communication; improving and extending relevant pronunciation features, including articulation, pausing, intonation, word stress and sentence stress.</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>The study method is primarily seminar-based. Following a blended delivery approach, activities include teacher input as well as individual and group work involving reading and appreciating texts, discussions and presentations of ideas.<br><br>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.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Persuasive written text</td><td>34%</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Group presentation</td><td>33%</td><td></td><td>✓</td><td></td></tr>
<tr><td>3. Debate</td><td>33%</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
</table>
<br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>Assessment 1 concentrates on persuasive techniques in writing and assesses students' achievement of LO (a). Assessment 2 is a presentation that covers both persuasive speaking and the use of visual aids to complement and reinforce the message; and is aligned with intended LO (b). Assessment 3 assesses students' performance in a different aspect of persuasion, the formal debate, in which students need to explain their perspective, defend arguments and persuade the audience. It aligns with intended LOs (a) and (b).</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Seminars</td><td>42 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
</table>
</td></tr>
</table>

| | | |
|---|---|---|
| | ▪ Self study/preparation | 84 Hrs. |
| | Total student study effort | 126 Hrs. |
| **Reading List and References** | *Course material*<br><br>Learning materials developed by the English Language Centre<br><br>*Recommended references*<br><br>Breaden, B. L. (1996). *Speaking to persuade.* Fort Worth, TX: Harcourt Brace College.<br><br>Leanne, S. (2008). *Say it like Obama: The power of speaking with purpose and vision.* New York, NY: McGraw Hill.<br><br>Rogers, W. (2007). *Persuasion: Messages, receivers, and contexts.* Lanham, MD: Rowman & Littlefield Publishers.<br><br>Stiff, J. B. (2003). *Persuasive communication* (2nd ed.). New York, NY: Guilford Press. | |

# 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: Advanced English for University Studies (ELC1014) |
| **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.<br><br>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 Learning Outcomes**<br>*(Note 1)* | Upon successful completion of the subject, students will be able to:<br><br>a. examine and analyse literary texts on various themes from different perspectives<br><br>b. discuss literary techniques employed by writers<br><br>c. appreciate and articulate differences in textual and visual media representations<br><br>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**<br>*(Note 2)* | 1. Written communication<br><br>Describing and interpreting content and language in literary texts; employing appropriate grammatical structures and vocabulary.<br><br>2. Spoken communication<br><br>Presenting critical evaluation of literary works effectively and convincingly.<br><br>3. Reading<br><br>Developing understanding of and competence in using literary devices such as metaphor, simile and symbolism, via reading literary texts and viewing film versions.<br><br>4. Language development<br><br>Improving fluency and pronunciation, and extending grammatical and lexical competence. |

<table>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>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.<br><br>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.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Individual paper</td><td>30%</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Written test</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Group 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>
<br>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:<br><br>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 (a). 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 a group project that requires reading and interpretation of more creative literature and presentation of 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>42 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self study/preparation</td><td>84 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>126 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Required reading<br><br>The PolyU library retains either hardcopies or electronic copies of the following titles.</td></tr>
</table>

| | |
|---|---|
| | The titles can also be found online.<br><br>Honey, M., & Cole, J. L. (eds.). (2002). *Madame Butterfly / John Luther Long; and A Japanese nightingale / Onoto Watanna (Winnifred Eaton): Two orientalist texts*. New Brunswick, N.J.: Rutgers University Press.<br>Available at Reserve Coll Reserve Coll PS3523.O4685 M33 2002<br>http://opera.stanford.edu/Puccini/Butterfly/source/JLLong.html<br><br>Stam, R., and Raengo, A. (eds.). (2004). *A companion to literature and film*. [electronic source] Blackwell reference online. Malden: Blackwell.<br><br>Call number PN1995.3.C65 2004eb<br>http://www.blackwellreference.com/subscriber/uid=262/book?id=g9780631230533_9780631230533&authstatuscode=202<br><br>Wilson, J. D. (ed.). (2009). *William Shakespeare's A Midsummer Night's Dream*. [electronic resource] Cambridge books online. Cambridge: Cambridge University Press.<br><br>Call number PR2827.A1 2009eb<br>http://shakespeare.mit.edu/midsummer/full.html<br><br>Other readings will be specified by the ELC teacher, and may contain short fiction, novelettes, plays and poetry. |

# Subject Description Form

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|---|---|
| **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:<br>(1) Introduce students to the engineering broad discipline and enthuse them about their major study<br>(2) Cultivate students' creativity and problem-solving ability, and global outlook<br>(3) Expose students to the concept and an understanding of entrepreneurship<br>(4) Engage the students in desirable forms of learning at university that emphasizes, self-regulation, autonomous learning and deep understanding |
| **Intended Learning Outcomes** | Upon completion of the subject, students will:<br>Be able to demonstrate an understanding and an enthusiasm about the engineering broad discipline and their major study<br>(a) Develop their problem-solving ability and global outlook<br>(b) Be able to demonstrate an understanding of entrepreneurship<br>(c) Be able to search for information, formulate a project plan, and manage a project with initiative<br>(d) Be able to demonstrate an understanding of of academic integrity [Note].<br>*Note: Outcome (e) is applicable to 4-year degree programmes and those Higher Diploma programmes that require the students to complete the Online Tutorial on Academic Integrity as described in the following sections.* |
| **Subject Synopsis/ Indicative Syllabus** | ***1. Online Tutorial on Academic Integrity (2 hours*)***<br>For students studying in 4-year degree programmes, they 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. For students studying Higher Diploma programmes, whether they are required to take this Online Tutorial or not will be stipulated by their host departments.<br><br>***2. Renowned Speaker Seminars (8 hours*)***<br>One seminar will be given by a renowned speaker to introduce students to the engineering broad discipline and to enthuse them about their major study. The seminars will also cultivate students' global outlook. The seminar will be |

| | |
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| | composed of a pre-seminar (2 hours), and then the actual seminar (2 hours). The pre-seminar aims at preparing the students for the actual seminar. The actual seminar will be delivered by the renowned speaker.<br><br>***3. Departmental Seminars (14 hours*)***<br>Four to six 1-hour Departmental Seminars will be delivered by chair professors and/or reputable professionals in the engineering broad discipline to arouse students' interests in engineering and to cultivate their understanding of and sense of belonging to the profession.<br><br>***4. Freshman Project (36 hours*)***<br>There will be 7 2-hour workshops, 1 presentation and 1 demonstration. The freshman project aims at developing students' creativity, problem-solving skills, and team-work abilities through hands-on tasks. Students will work in small groups under the guidance of instructors to design and implement an engineering solution to some given problems. The key elements are *creativity*, *problems solving* through *interaction*, *participation* and *team works*.<br><br>***5. Entrepreneurship Project (45 hours*)***<br>The entrepreneurship project is designed to develop students' appreciation and understanding about entrepreneurship and the commercialization process by attending seminars/workshops, identifying technology opportunities and developing a simple business plan.<br><br>(* Note: hours indicate total student workload) |
| **Teaching/Learning Methodology** | ***Online Tutorial on Academic Integrity***<br><br>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.<br><br>***Seminars***<br><br>The 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 make preparation by searching for information and doing 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.<br><br>***Freshman Project***<br><br>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* and *team-work abilities*. Assessment tasks will consist of *demonstration*, *presentation*, *reports*, and *reflective essay writings*. These are designed to evaluate individual student's performance and achievement as well as to encourage active participation.

***Entrepreneurship Project***

There will be 3 2½-hour lecture/seminar, 1 1½-hour tutorial, 1 3-hour workshop and 1 3-hour presentation. A general overview of the concepts required to conduct the project will be provided to students through lectures and seminars. 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) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | d | e |
| ***Online Tutorial on Academic Integrity*** [Note] | 0% | | | | | ✓ |
| ***Seminars***<br>Quizzes | 20% | ✓ | | | | |
| ***Freshman Project***<br>Project demonstration, presentation, report and reflective essay writing | 40% | | ✓ | | ✓ | |
| ***Entrepreneurship Project***<br>Business plan | 40% | | | ✓ | ✓ | |
| 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

<table>
<tr><td></td><td colspan="2">their appreciation and understanding about the engineering discipline. Through project demonstration, presentation and project reports, students can demonstrate their creativity, problem-solving skills and team-work abilities. They can also demonstrate their ability to search for information, formulate a project plan, and manage a project with initiative. Through business plan, students can demonstrate their understanding about entrepreneurship.<br><br>Pass Conditions<br><br>For students studying the 4-year degree programmes, and students studying in Higher Diploma programmes whose host departments have stipulated that they are required to take the Online Tutorial, in order to pass this subject, they must obtain a Grade D or above for total marks comprising the Seminars, Freshman Project and Entrepreneurship Project as described here AND passed the Online Tutorial on Academic Integrity on or before week 5 of semester 1 as described in the previous section. For students studying in Higher Diploma programmes whose host departments have not stipulated that they are required to take the Online Tutorial, there is no requirement to pass the Online Tutorial in order to pass this subject.<br><br>Note: This is only applicable to 4-year degree programmes and those Higher Diploma programmes that require the students to complete the Online Tutorial on Academic Integrity.</td></tr>
<tr><td rowspan="8">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Freshman project: 2 hours per week for 9 weeks</td><td>18 Hrs.</td></tr>
<tr><td>▪ Entrepreneurship project: 1.5- 3 hours per week for 6 weeks</td><td>15 hours</td></tr>
<tr><td>▪ Renowned Speaker Seminar</td><td>4 hours</td></tr>
<tr><td>▪ Departmental Seminar</td><td>6 hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ 62 hours (for Online Tutorial on Academic Integrity, background information search, project work, meeting and discussion, preparation for presentation and demonstration, report and reflective essay writing)</td><td>62 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>105 Hrs.</td></tr>
<tr><td>Reading List and References</td><td colspan="2">H. Scott Fogler and Steven E. LeBlanc, Strategies for creative problem solving, Upper Saddle River, N.J. : Prentice Hall, 2008<br><br>N.J. Smith (ed), Engineering project management, Oxford, UK; Malden, MA: Blackwell, 2008<br><br>Gene Moriaty, The engineering project: its nature, ethics, and promise, University Park, Pa.: Pennsylvania State University Press, 2008.<br><br>K. Allen, Entrepreneurship for scientists and engineers, Upper Saddle River, N.J. : Prentice Hall, 2010.</td></tr>
</table>

Revised on 20 August 2012

# Subject Description Form

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|---|---|
| **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<br>(ii) To equip students with sound skills in C/C++ programming language<br>(iii) To equip students with techniques for developing structured and object-oriented computer programs<br>(iv) To demonstrate the techniques for implementing engineering applications using computer programs. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br><br>Category A: Professional/academic knowledge and skills<br><br>1. Familiarize themselves with at least one C/C++ programming environment.<br><br>2. Be proficient in using the basic constructs of C/C++ to develop a computer program.<br><br>3. Be able to develop a structured and documented computer program.<br><br>4. Understand the fundamentals of object-oriented programming and be able to apply it in computer program development.<br><br>5. Be able to apply the computer programming techniques to solve practical engineering problems. |

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| | Category B: Attributes for all-roundedness<br><br>6. Be able to solve problems by using systematic approaches in a team. |
| **Subject Synopsis/ Indicative Syllabus** | **Syllabus:**<br><br>1. Introduction to programming - Components of a computer; Programming environment; Process of application development.<br><br>2. Bolts and Nuts of C/C++ - Preprocessor; Program code; Functions; Comments; Variables and constants; Expressions and statements; Operators.<br><br>3. Program Flow Control - Branching and looping; Function parameters passing; Return values; Local and global variables; Scope of variables.<br><br>4. Program Design and Debugging - Structured program design; Modular programming; Exceptions and debugging. Case study: Using the Visual C++ debugger.<br><br>5. Basic Object Oriented Programming - Objects and classes; Private versus public; Implementing class methods; Constructors and destructors.<br><br>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.<br><br>7. Stream I/O - Input and output as streams; File I/O using streams.<br><br>8. Using C/C++ in Engineering Applications - Solving practical problems using C/C++; Developing graphical user interfaces for engineering applications. |

**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 | 1,2,3,4,5 | 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. |
| Homework, and tests | 1,2,3,4,5 | Through working homework, students will develop a firm understanding and comprehension of the knowledge taught. They will analyse given C/C++ applications and apply knowledge in solving problems. For some design type of problems, they will have to synthesize solutions by evaluating different alternatives. To assure students' understanding of fundamental concepts, closed-book tests are arranged regularly. To enhance the students' problem solving skill in a given programming environment, open-book programming tests are arranged regularly. |

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| | Mini-project | 1,2,3,4,5,6 | After all the subject materials have been delivered, students are asked to finish a mini-project in a team. The project involves a practical engineering problem of some stated specification. |

**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. In-class exercises | 10 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 2. Short-quizzes | 10 | | ✓ | ✓ | ✓ | | |
| 3. Closed-book tests | 20 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 4. Programming tests | 30 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 5. Mini-project | 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, closed-book tests and programming tests are conducted to help students familiarized with the programming language and skills. The problems to be solved by the students are typically presented as practical engineering problems. Through conducting a mini-project that lasts for several weeks, students would be able to experience how to solve problems by using a systematic approach in a team.

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| **Student Study Effort Expected (Within TWO** | **Class contact:** | 64 Hours |
| | ▪ Lecture | 30 Hours |

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|---|---|---|
| **semesters)** | ▪ Tutorial | 19 Hours |
| | ▪ Test/Quiz | 14 Hours |
| | ▪ Mini-project presentation | 1 Hours |
| | **Other student study effort:** | 61 Hours |
| | ▪ Self-studying | 40 Hours |
| | ▪ Homework | 13 Hours |
| | ▪ Mini-project/Report | 8 Hours |
| | **Total student study effort** | 125 Hours |
| **Reading List and References** | **Reference Books:**<br><br>1. J. Liberty, S. Rao, and B. Jones, Sams Teach Yourself C++ in One Hour a Day. Indianapolis, IN: Sams, 2009.<br>2. P.J. Deitel and H.M. Deitel, *C++ How To Program*, 7th ed. Pearson, 2010.<br>3. J. Liberty and D.B. Horvath, Sams Teach Yourself C++ in 24 hours. Indianapolis, IN: Sams, 2005.<br>4. I Horton, Ivor Hortons Beginning Visual C++ 2010 [electronic resource]. Indianapolis, IN: Wiley, 2010. | |

*August 2012*

# Subject Description Form

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|---|---|
| **Subject Code** | IC2105 |
| **Subject Title** | Engineering Communication and Fundamentals |
| **Credit Value** | 4 Training Credits |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | This subject offers a wide spectrum of coverage on various engineering fundamental matters, including Engineering Drawing and CAD, Basic Scientific Computing, Basic Mechatronic Practice, and Industrial Safety, that aims at providing the necessary fundamental knowledge and computing skills to all year 1 students interested in engineering. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a) explain the principles and conventional representation of engineering drawings according to engineering standards and be able to use it as a medium in technical communication and documentation with CAD application, modelling and practice with application in mechanical, industrial systems, electrical, electronic and information engineering;<br>b) apply scientific computing software for computing in science and engineering including visualization and programming;<br>c) design and analyze practical controller hardware, software, actuation devices and human-machine interface for simple mechatronic systems including basic practice in hydraulic, pneumatic and electric systems with common engineering components such as motor drives, mechanical drives, gears, cams, belts, pulleys, couplings, bearings, seals and fasteners; and<br>d) explain basic occupational health and industrial safety requirements for engineering practice. |

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| **Subject Synopsis/ Indicative Syllabus** | **Syllabus:**<br><br>1. (TM8050) Engineering Drawing and CAD<br><br>1.1. Fundamentals of Engineering Drawing and CAD<br>Principles of orthographic projection; sectioning; dimensioning; sketching; general tolerances and surface finishes; conventional representation of screw threads and fasteners; types of drawings including part drawing and assembly drawing.<br><br>Introduction to CAD; 2D drawings and general concepts on 3D computer modeling including extruding, revolving, sweeping, and lofting; parametric feature based solid modeling; construction and detailing of solid features; solid model modification and its limitations; concepts of assembly modeling including bottom up and top down approaches for the generation of parts, subassemblies, and final assembly; virtual validation and simulation, generation of 2D drawings from 3D parts and assemblies; drawing annotation including dimensioning, tolerancing, and part list.<br><br>1.2. Electrical Drawing<br>Wiring diagram and wiring table for electronic and electrical installation, functional representation of circuit, system block diagram, electrical and electronic device symbols and layout, architectural wiring diagram with reference to the architectural symbols for electrical drawings in Hong Kong and international standards.<br><br>1.3. Electronic Design Automation<br>Introduction to electronic design automation software; circuit schematics capture and representation; placement of components, capturing, annotation, labeling, net list. Electronic parts library, symbols, decals, physical packages, discrete components, integrated circuits, logic and analogue circuits, electronic parts creation and application.<br><br>2. (TM3012) Basic Scientific Computing<br><br>2.1. 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.<br><br>2.2. Basic plotting, formatting graph, 2D and 3D plots, annotations, contour, mesh and surface plots, colormap.<br><br>2.3. M-file programming and debugging; scripts, functions, logic operations, flow control and graphic user interfaces. |

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| | 3. (TM0510) Basic Mechatronic Practice<br>3.1. Definitions of mechatronics; design and operation of typical mechatronic systems; appreciation of measurement system, actuator system, motor drives, mechanical drives, gear train and linkage, pneumatic and hydraulic systems, signal conditioning, and human-machine interfaces.<br>3.2. Integration of system components using appropriate controller hardware and software such as PLC, PAC, and Microcontroller system; use of simulation software packages for pneumatic and hydraulic circuit design.<br>4. (TM2009) Industrial Safety<br>4.1. Safety Management: Overview, essential elements of safety management, safety training, accident management, and emergency procedures.<br>4.2. Safety Law: F&IU Ordinance and principal regulations, OSH Ordinance and principal regulations.<br>4.3. Occupational Hygiene and Environmental Safety: Noise hazard and control; dust hazard and control; ergonomics of manual handling.<br>4.4. Safety Technology: Mechanical lifting, fire prevention, dangerous substances and chemical safety, machinery hazards and guarding, electrical safety, first aid, job safety analysis, fault tree analysis, personal protective equipment. |
| **Learning Methodology** | The teaching and learning methods include lectures, workshop tutorials, and practical works. The lectures are aimed at providing students with an overall and concrete background knowledge required for understanding key issues in engineering communication, use of standard engineering components and systems, and importance of industrial safety. The workshop tutorials are aimed at enhancing students' in-depth knowledge and ability in applying the knowledge and skills to complete specific tasks. The practical works aim at facilitating students to review the diverse topics covered in this course and perform active learning with research, practice, questioning, and problem solving in a unified activity. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Assessment Methods | Weighting (%) | Intended Learning Outcomes Assessed | | | |
|---|---|---|---|---|---|
| | | a | b | c | d |
| Continuous Assessment | | | | | |
| 1. Assignment / Project | Refer to individual Module Description Form | ✓ | ✓ | ✓ | ✓ |
| 2. Test | | | ✓ | ✓ | ✓ |
| 3. Report / Logbook | | | ✓ | ✓ | |
| Total | 100 | | | | |

| Assessment Methods | Remarks |
|---|---|
| 1. Assignment / Project | The project is designed to facilitate students to reflect and apply the knowledge periodically throughout the training. |
| 2. Test | Test is designed to facilitate students to review the breadth and depth of their understanding on specific topics. |
| 3. Report / Logbook | Report / Logbook is designed to facilitate students to acquire deep understanding on the topics of the training and to present those concepts clearly. |

**Student Study Effort Required**

| **Class Contact** | **TM8050** | **TM3012** | **TM0510** | **TM2009** |
|---|---|---|---|---|
| ▪ Lecture | 18 Hrs. | 9 Hrs. | 6 Hrs. | 14 Hrs. |
| ▪ Tutorial | 13 Hrs. | | | |
| ▪ In-class Assignment/ Hands-on Practice | 17 Hrs. | 18 Hrs. | 24 Hrs. | 1 Hr. |
| **Other Study Effort** | | | | |
| ▪ Coursework | 8 Hrs. | | | |
| **Total Study Effort** | **128 Hrs.** | | | |

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| **Reading List and References** | **Reference Software List:**<br>1. AutoCAD from Autodesk Inc.<br>2. SolidWorks from Dassault Systèmes Solidworks Corp.<br>3. MATLAB from The Mathworks Inc.<br>4. PADS from Mentor Graphics Inc.<br>**Reference Standards and Handbooks:**<br>1. BS8888 Technical Product Specification (TPS) Specification.<br>2. Cecil H. Jensen, et al, Engineering Drawing and Design, McGraw-Hill, 2008.<br>3. Warrendale, SAE fastener standards manual, Society of Automotive Engineers, 1997.<br>4. Timothy H Wentzell, et al, Machine Design, Delmar Learning, 2004.<br>5. Czernik, Daniel, Gaskets: Design, Selection, and Testing, McGraw-Hill, 1995.<br>6. Michael M. Khonsari, E. Richard Booser, Applied Tribology: Bearing Design and Lubrication, Wiley-Interscience, 2001.<br>7. IEEE Standard 315 / ANSI Y32.2 / CSA Z99 Graphic Symbols for Electrical and Electronics Diagrams.<br>8. IEC 61082 Preparation of Documents used in Electrotechnology.<br>**Reference Books:**<br>Training material, manual and articles published by Industrial Centre. |

# Subject Description Form

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|---|---|
| **Subject Code** | IC2112 |
| **Subject Title** | IC Training I (EE) |
| **Credit Value** | 4 Training Credits |
| **Level** | 2 |
| **Pre-requisite/ Co-requisite/ Exclusion** | Nil |
| **Objectives** | 1) To provide trainees with simulated working environments and training of industrial practices in Electrical Engineering.<br>2) This subject covers a wide range of fundamental electrical engineering application technology that including electrical installation practice, lighting and electrical system design, LV switchboard and power monitoring, integral building system and basic electronic practice. |
| **Intended Learning Outcomes** | Upon completion of the subject, students will be able to:<br>a) identify relevant engineering theories and principles and to apply them in hands-on training exercises to determine system feasibility;<br>b) compare and contrast conceptual design, develop actual work sequences and methods for various electrical installations;<br>c) undertake the design, construction, testing and commissioning electrical distribution system in buildings on the basis of recognize the engineering standards, regulations and practices;<br>d) apply intelligent building control technology effectively and evaluate new building automation/intelligent control schemes; and<br>e) apply their knowledge and skills for system analysis. |

| | |
|---|---|
| **Subject Synopsis/ Indicative Syllabus** | (TM0367) Lighting and Electrical System Design<br>Interior lighting design and calculation; daylight illumination consideration; lumens and reflectors; T5, T8 and T11 lamps; energy conservation.<br>Introduction of low-voltage power distribution system and code of practices of electrical design in Hong Kong; examine architectural drawings; design lighting and electrical services; prepare layout drawings and schematics.<br>(TM0389) Low-voltage Switchboard and Power Monitoring, AC Control and PLC<br>Specifications, standards and requirements of LV switchboard; IDMTL and electronic protection relays; schematic diagram, testing, commissioning and maintenance.<br>Power monitoring and analysis, noise and harmonics; active filters and real-time capacitor bank.<br>Introduction of programmable controller systems, sensors, actuators, drives, timers, counters, ladder logic programming and testing.<br>(TM0383) Integrated Building Systems<br>Proprietary and open systems (BMS, EIB and DALI); sensors and actuators; wiring circuit, scenes control; system design, programming and commissioning; intelligent building system integration.<br>(TM0373) Electrical Installation and Basic Electronic Practice<br>Wiring for conventional low voltage installations and intelligent building control systems (EIB and DALI); final lighting and power circuits, control gears and protective devices; inspection, testing,<br>Identification of electronic circuit components, soldering and de-soldering, Dry film process, Etching process. |
| **Learning Methodology** | The teaching and learning methods include lectures, workshop tutorials, and practical works to convey general principles, techniques and related technologies to students. Their learning knowledge will be strengthened through the practical exercises and case studies in a problem-based format for the development of system integration skills, and to effectively apply those on real world environments. |

**Assessment Methods in Alignment with Intended Learning Outcomes**

| Assessment Methods | Weighting (%) | Intended Learning Outcomes Assessed | | | | |
|---|---|---|---|---|---|---|
| Assessment Methods | Weighting (%) | Assessed | | | | |
| TM0367 Lighting and Electrical System Design | | a | b | c | d | e |
| 1. Assignment | 40 | ✓ | ✓ | ✓ | | ✓ |
| 2. Test | 30 | ✓ | ✓ | | | |
| 3. Training Report | 30 | ✓ | ✓ | ✓ | | ✓ |
| Total | 100 | | | | | |

| Assessment Methods | Weighting (%) | Intended Learning Outcomes Assessed | | | | |
|---|---|---|---|---|---|---|
| TM0389 Low-Voltage Switchboard and Power Monitoring, AC Control and PLC | | a | b | c | d | e |
| 1. Assignment | 40 | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2. Test | 30 | ✓ | ✓ | | | |
| 3. Training Report | 30 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Total | 100 | | | | | |

| Assessment Methods | Weighting (%) | Intended Learning Outcomes Assessed | | | | |
|---|---|---|---|---|---|---|
| TM0383 Integrated Building Systems | | a | b | c | d | e |
| 1. Assignment | 40 | ✓ | | | ✓ | ✓ |
| 2. Test | 30 | ✓ | | | | |
| 3. Training Report | 30 | ✓ | | | ✓ | ✓ |
| Total | 100 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | TM0373 Electrical Installation and Basic Electronic Practice | | a | b | c | d | e |
| | 1. Assignment | 40 | ✓ | ✓ | ✓ | | ✓ |
| | 2. Test | 30 | ✓ | ✓ | | | |
| | 3. Training Report | 30 | ✓ | ✓ | ✓ | | ✓ |
| | Total | 100 | | | | | |

The assignment is designed to facilitate students to reflect and apply the knowledge periodically throughout the training.

Test is designed to facilitate students to review the breadth and depth of their understanding on specific topics.

Training Report is designed to facilitate students to acquire deep understanding on the topics of the training and to present those concepts clearly.

**Student Study Effort Required**

| **Class Contact** | |
|---|---|
| ▪ Lecture / Tutorial / Demonstration | 30 Hrs. |
| ▪ Workshop Practice | 88 Hrs. |
| ▪ Test | 2 Hrs. |
| **Other Study Effort** | 0 Hr. |
| **Total Study Effort** | **120 Hrs.** |

**Reading List and References**

1. Training material, manual and articles published by the Industrial Centre.
2. EMSD, Code of Practice for the Electricity (Wiring) regulations, 2003 Edition.
3. IEE wiring regulation, 16th Edition.