THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Doctor of Philosophy (PhD) / Master of Philosophy (MPhil)

(Full-Time: 88011/88012 / Part-Time: 88111/88112)

Programme Booklet (2017/18)

Department of Electronic and Information Engineering

電子及資訊工程學系

DOCTOR OF PHILOSOPHY (PHD) / MASTER OF PHILOSOPHY (MPHIL)
(FULL-TIME: 88011/88012 / PART-TIME: 88111/88112)

Contents

		Page
1.	General Information	1
2.	Rationale, Aims and Intended Learning Outcomes of the Programme	3
3.	Entrance Requirements	6
4.	Programme, Subjects, and Credits	7
	4.1 Programme Specified Subjects	7
	4.2 Research Seminar Attendance	10
	4.3 Practicum Requirement	11
	4.4 Thesis	12
	4.5 Credit Transfer	12
5.	Specified Progression Pattern	13
6.	Assessment Regulations	16
7.	SYLLABI	16

LEVEL 6

HTI6081	Ethics: Research, Professional & Personal Perspectives	17
EIE6200	Methodology for Engineering and Scientific Research	19
EIE6207	Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing	22
EIE6811 – EIE6813	Guided Study in Electronic and Information Engineering I/II/III	26
EIE621 – EIE623	Special Topics in Electronic and Information Engineering I/II/III	29

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

This document should be read together with the "Regulations and Administrative Procedures for the Degrees of MPhil and PhD" and the "Research Student Handbook" available at http://www.polyu.edu.hk/ro/STDHBK/.

1. GENERAL INFORMATION

1.1 Cohort of Intakes and Readership

This programme booklet is the programme document for the 2017/18 cohort. Just in case any updated information is necessary after the publication of this booklet, students are requested to refer to the URL "http://www.eie.polyu.edu.hk/docs/Programmes/Booklets/PhD_MPhil/PhD_MPhil_Programme_Booklet_1718.pdf" for the most updated information. Should any discrepancy between the contents of this booklet and University regulations arise, University regulations always prevail.

1.2 Programme Information

Title of Programme	**Doctor of Philosophy (PhD) / Master of Philosophy (MPhil)**
Host Department	Department of Electronic and Information Engineering (EIE)
Mode of Attendance	Full-time/Part-time
Programme Structure	Coursework Credits and Thesis

Final Award **Doctor of Philosophy (PhD) / Master of Philosophy (MPhil)**
哲學博士 / 哲學碩士

Modes of attendance

There are two possible modes of study: Full-time (FT) mode and Part-time (PT) mode. Students will normally be admitted into the research degree programmes under the full-time mode of study. Admission to the part-time mode of study will be subject to study plan and needs.

PhD Programme

Full-time
Normal Study Period:
36 months (or 48 months for students admitted with a Bachelor's degree)

Maximum Study Period:
60 months (or 72 months for students admitted with a Bachelor's degree)

Part-time
Normal Study Period:
72 months (or 96 months for students admitted with a Bachelor's degree)

Maximum Study Period:
84 months (or 108 months for students admitted with a Bachelor's degree)

Residence requirement for both Full-time and Part-time modes
3 regular semesters (or 4 regular semesters for students admitted with a Bachelor's Degree). All the students must fulfil the residence requirement before thesis submission.

Note: This is not applicable to PhD students under joint PhD programmes of which the residence requirement should be governed by the respective partnership agreement for joint PhD supervision leading to dual awards.

MPhil Programme

Full-time
Normal Study Period:
24 months

Maximum Study Period:
36 months

Part-time
Normal Study Period:
48 months

Maximum Study Period:
60 months

Residence requirement for both Full-time and Part-time modes
2 regular semesters. All the students must fulfil the residence requirement before thesis submission.

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

2.1 Background and Rationale

Electronic and information engineering are among the key technologies that play important roles in daily living. Various sectors, such as business, commerce, communication, education, entertainment, healthcare and transportation, require electronic and information engineering for smooth operation. Hence, it is envisioned that there is a great need of professionals who possess knowledge and leadership in the areas of electronic and information engineering, as well as generic skills of problem solving, innovation, analysis and adaptability to contribute to the technological and economic development in the region and in the world.

2.2 Aims

The research degree programmes are designed to enable students to:

1. acquire competence in research methods and scholarship; and
2. display sustained independent effort and independent original thought.

The PhD programmes should target to produce academics, researchers or industrial R & D professionals.

2.3 Relationship of Programme Aims to University Missions

The University has the following missions:

1. To nurture graduates who are critical thinkers, effective communicators, innovative problem solvers, lifelong learners and ethical leaders.
2. To advance knowledge and the frontiers of technology to meet the changing needs of society.
3. To support a University community in which all members can excel through education and scholarship.

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

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

2.4 Intended Learning Outcomes of the Programme

On successful completion of the research degree programme, students will be:

1. able to understand the copyright and ethical issues related to research and publications;
2. able to formulate research objectives and analyze research problems;
3. able to apply relevant and/or develop advanced techniques to conduct research;
4. able to conduct high-quality independent research in the Electronic and Information Engineering discipline;
5. able to disseminate research results effectively in both written and oral forms;
6. able to assimilate advanced knowledge in the Electronic and Information Engineering discipline;
7. prepared for a professional career in the academia/ industry/ business/ public/private sector; and
8. prepared to pursue a PhD degree (for MPhil graduates).

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

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

2.5 Relationship between the Intended Learning Outcomes of the Programme with Subjects

The curriculum map below illustrates the relationship between the Learning Outcomes of the Programme and the subjects:

Programme Outcomes	HTI6081 Ethics: Research, Professional & Personal Perspectives	EIE6200 Methodology for Engineering and Scientific Research	EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing	Research Postgraduate courses in PolyU/other universities OR EIE6811 – EIE6813 EIE Guided-study Subjects	EIE621 – EIE623 EngD Guided-study Subjects (Mode I)	EIE6201 – EIE6204 Research Seminar	EIE6205 – EIE6206 Practicum	Thesis and Oral Examination
Understand the copyright and ethical issues related to research and publications	√	√						
Formulate research objectives and analyze research problems		√	√		√			√
Apply relevant and/or develop advanced techniques to conduct research			√		√			√
Conduct high-quality independent research in the Electronic and Information Engineering discipline								√
Disseminate research results effectively in both written and Oral forms		√						√
Assimilate advanced knowledge in the Electronic and Information Engineering discipline			√	√	√	√		√
Prepare students for a professional career in the academia/ industry/ business/ public/private sector							√	√
Prepare students to pursue a PhD degree (for MPhil graduates)								√

3. ENTRANCE REQUIREMENTS

3.1 University General Minimum Entrance Requirements

To register for the degree of MPhil, a student shall hold:

- a Bachelor's degree with first or second class honours of The Hong Kong Polytechnic University or a recognised university; or
- other academic qualifications which are deemed to be equivalent.

To register for the degree of PhD, a student shall hold:

- a postgraduate degree containing a significant research component, such as a dissertation, conferred by The Hong Kong Polytechnic University or a recognised university.

In exceptional circumstances applicants other than those stipulated in the above paragraph may be admitted directly to the PhD programme. For example, applicants with a Bachelor's degree with First Class Honours, or the equivalent.

Admission can be made based on other equivalent qualifications on an individual basis.

3.2 English Language Requirement

Requirements for students who do not have a degree of which the language of instruction was English from a recognised university are:

- An overall score of at least 6.5 (with score for the writing component at 6.0 or above) in the International English Language Testing System (IELTS); or
- 550 or above in the Test of English as a Foreign Language (TOEFL) for the paper-based test (with a score of at least 4 out of 6 in the Test of Written English), or 80 or above in the internet-based test (with a writing score of 23 or above).

Alternatively, consideration will be given to acceptable scores in other internationally-recognised public examinations, such as the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT).

All English language test scores are considered valid for five years after the date of the test.

3.3 Language Proficiency Requirement after Admission

On admission, all students must sit for the Research Language Skills Assessment which will focus on assessing students' language skills in academic writing and oral communication. Before thesis submission, students will be required to take and pass the language enhancement subjects/programmes if improvement in the related areas is required after the Assessment.

4. PROGRAMME, SUBJECTS, AND CREDITS

4.1 Programme Specified Subjects

Most subjects are of standard credit value carrying 3 credits each, except for some subjects, such as Research Seminars, Practicum, etc. which carry credits other than 3. The following table lists the subjects, their credit values, and the category they belong to (Compulsory or Elective).

Mode and level	Subject	Compulsory/ Elective	Credit
MPhil 2-year Full-time/ 4-year Part-time	HTI6081 Ethics: Research, Professional & Personal Perspectives	Compulsory	1
	EIE6200 Methodology for Engineering and Scientific Research	Compulsory	3
	EIE6201 Research Seminar (I)	Compulsory	1
	EIE6202 Research Seminar (II)	Compulsory	1
	<u>ONE elective</u> from: EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing OR EIE Guided-study Subjects EIE6811 – EIE6813 OR EngD Guided-study Subjects EIE621 – EIE623 (Mode I: with accompanying MSc subject) OR Research postgraduate courses offered by PolyU or other universities	Elective	3
	Thesis	Compulsory	–
			Total: 9 credits

Mode and level	Subject	Compulsory/ Elective	Credit
PhD 3-year Full-time/ 6-year Part-time	HTI6081 Ethics: Research, Professional & Personal Perspectives	Compulsory	1
	EIE6200 Methodology for Engineering and Scientific Research	Compulsory	3
	EIE6201 Research Seminar (I)	Compulsory	1
	EIE6202 Research Seminar (II)	Compulsory	1
	EIE6203 Research Seminar (III)	Compulsory	1
	EIE6205 Practicum (I)	Compulsory	1
	EIE6206 Practicum (II)	Compulsory	1
	EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing	Compulsory	3
	ONE elective from: EIE Guided-study Subjects EIE6811 – EIE6813 OR EngD Guided-study Subjects EIE621 – EIE623 (Mode I: with accompanying MSc subject) OR Research postgraduate courses offered by PolyU or other universities	Elective	3
	Thesis	Compulsory	–
			Total: 15 credits

Mode and level	Subject	Compulsory/ Elective	Credit
PhD 4-year Full-time/ 8-year Part-time	HTI6081 Ethics: Research, Professional & Personal Perspectives	Compulsory	1
	EIE6200 Methodology for Engineering and Scientific Research	Compulsory	3
	EIE6201 Research Seminar (I)	Compulsory	1
	EIE6202 Research Seminar (II)	Compulsory	1
	EIE6203 Research Seminar (III)	Compulsory	1
	EIE6204 Research Seminar (IV)	Compulsory	1
	EIE6205 Practicum (I)	Compulsory	1
	EIE6206 Practicum (II)	Compulsory	1
	EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing	Compulsory	3
	THREE electives from: EIE Guided-study Subjects EIE6811 – EIE6813 OR EngD Guided-study Subjects EIE621 – EIE623 (Mode I: with accompanying MSc subject) *Students are allowed to take only ONE subject from this pool. OR Research postgraduate courses offered by PolyU or other universities	Elective	9
	Thesis	Compulsory	–
			Total: 22 credits

4.2 Research Seminar Attendance

4.2.1 All full-time MPhil and PhD students have to attend a minimum of 10 research seminars per year, in addition to workshops/conferences, and to submit a report, to the Chief Supervisor, of no less than 1,500 words (excluding references) on one of the attended seminars every year.

4.2.2 All part-time students are required to attend at least 10 research seminars in every two years, in addition to workshops/conferences, and to submit a report, to the Chief Supervisor, of no less than 1,500 words (excluding references) on one of the attended seminars once every two years.

4.2.3 The research seminars may or may not be organised by the host department and are expected to last not less than an hour each. The topic of the seminar reported on should not be related directly to the thesis title of the student. Signature of the speaker or chairperson should be obtained for each seminar.

4.2.4 Chief Supervisors will assess the report which will be given either a pass or failure grade. Students failing to submit a report to the satisfaction of their Chief Supervisor are required to make a re-submission until a pass grade is obtained. The Chief Supervisor should then pass the record of the seminars attended by their students and the report to the Research Office for custody at the end of each academic year.

4.2.5 Students are recommended to complete one credit per year (for full-time students) or per two years (for part-time students) to fulfil the above-mentioned requirement, with an overall assessment grade of Pass and Fail. However, as deemed appropriate by the Chief Supervisor, they are allowed to complete at most two credits per year (for full-time students) or per two years (for part-time students) to fulfil the research seminar credit requirement.

4.2.6 The total Research Seminar Credits to be attained by the students are:

2-year FT/4-year PT MPhil: 2 credits
EIE6201 Research Seminar (I) – 1 credit
EIE6202 Research Seminar (II) – 1 credit

3-year FT/6-year PT PhD : 3 credits
EIE6201 Research Seminar (I) – 1 credit
EIE6202 Research Seminar (II) – 1 credit
EIE6203 Research Seminar (III) – 1 credit

4-year FT/8-year PT PhD : 4 credits

EIE6201 Research Seminar (I) – 1 credit
EIE6202 Research Seminar (II) – 1 credit
EIE6203 Research Seminar (III) – 1 credit
EIE6204 Research Seminar (IV) – 1 credit

4.3 Practicum Requirement

4.3.1 All PhD students, irrespective of the funding source and the mode of study, should attain two practicum credits before thesis submission. To earn one credit, students will be required to engage in teaching/research supporting activities assigned by the Head of Department or his delegate for 6 hours/week in any 13-week semester.

4.3.2 PhD students can complete the practicum anytime before thesis submission. They may choose to complete the practicum within the same semester or in two semesters, subject to the approval of the Chief Supervisor. PhD students who are stipend recipients are allowed to fulfil part of the departmental training requirement through the completion of compulsory practicum credits.

4.3.3 Students who will undertake teaching supporting activities should complete the training programmes organised by the EDC and the ELC before the commencement of such teaching supporting activities. PhD students who are required to undertake teaching supporting activities in their practicum credits will be required to complete a training programme organized by the EDC as required by the Department. Students who are required to interact directly with students in English as a part of their duties in supporting teaching and learning must demonstrate their language competence to fulfill the intended duties to the satisfaction of the host department. All eligible students except those who are native English speakers will also be required to successfully complete a language training programme offered by the ELC before taking up any teaching supporting activities.

4.3.4 The Head of Department or his delegate are required to:

a. ensure that the teaching/research supporting activities assigned to students are structured and can be assessed properly;
b. submit to the Subject Assessment Panel, at the end of the practicum, an assessment report on the performance of the relevant student(s), with details of activities undertaken and an overall assessment grade of Pass or Fail.

4.3.5 The two Practicum credits all PhD students must complete before thesis submission are:

EIE6205 Practicum (I) – 1 credit
EIE6206 Practicum (II) – 1 credit

4.4 Thesis

4.4.1 The PhD or MPhil degree is awarded to students who, on completion of an approved programme of study and research, present theses that embody the results of their research and satisfy the examiners in an oral examination in matters relevant to the subject of the thesis. These subjects are chosen by the student, with advice from the supervisor, from a wide range on offer.

4.4.2 PhD and MPhil students must satisfactorily investigate or evaluate a chosen area, demonstrate an understanding of the context and significance of the work, display sustained independent effort and original thought and present a clear, complete thesis of a quality worthy of publication.

4.4.3 PhD students are also expected to produce evidence and argument supporting an original proposition that results in a significant contribution to knowledge of a subject.

4.4.4 Students are required to complete the coursework credit requirements before submission of their thesis for examination. All MPhil and PhD students need to complete their coursework with a qualifying GPA of 2.7 or above before submission of their thesis for examination.

4.5 Credit Transfer

4.5.1 Credits have been used to contribute to an award should not be transferred to contribute to the coursework requirement of a research programme.

4.5.2 3-year full-time/6-year part-time PhD students may be exceptionally allowed to transfer one credit from their previous studies in HTI6081 Ethics: Research, Professional & Personal Perspectives and one credit from their previous attendance in research seminars.

4.5.3 Credits to be transferred can be gained from within or outside of PolyU.

5. SPECIFIED PROGRESSION PATTERN

5.1 Master of Philosophy (MPhil)

<table>
<tr><th colspan="3"><u>2-year Full-time / 4-year Part-time MPhil (9 credits)</u></th></tr>
<tr><th>Year of study</th><th>Compulsory</th><th>Elective</th></tr>
<tr><td colspan="2">FT Year 1 / PT Years 1 & 2</td><td rowspan="6">3 credits, i.e. <u>1 elective</u> from:
• EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing
OR
• EIE Guided-study Subjects # EIE6811 – EIE6813
OR
• EngD Guided-study Subjects (Mode I: with accompanying MSc subject) # EIE621 – EIE623
OR
• Research postgraduate courses offered by PolyU or other universities</td></tr>
<tr><td>HTI6081 Ethics: Research, Professional & Personal Perspectives</td><td>1 credit</td></tr>
<tr><td>EIE6200 Methodology for Engineering and Scientific Research</td><td>3 credits</td></tr>
<tr><td>EIE6201 Research Seminar (I)</td><td>1 credit</td></tr>
<tr><td colspan="2">FT Year 2 / PT Years 3 & 4</td></tr>
<tr><td>EIE6202 Research Seminar (II)</td><td>1 credit</td></tr>
<tr><td>Thesis</td><td>–</td><td>NA</td></tr>
<tr><td>Total:</td><td>6 credits</td><td>3 credits</td></tr>
</table>

Please refer to the Guided-study Subject lists at the end of this section.

5.2 Doctor of Philosophy (PhD)

<table>
<tr><th colspan="3"><u>3-year Full-time / 6-year Part-time PhD (15 credits)</u></th></tr>
<tr><th>Year of study</th><th>Compulsory</th><th>Elective</th></tr>
<tr><td colspan="2">FT Year 1 / PT Years 1 & 2</td><td rowspan="11">3 credits, i.e. <u>1 elective</u> from:
• EIE Guided-study Subjects # EIE6811 – EIE6813
OR
• EngD Guided-study Subjects (Mode I: with accompanying MSc subject) # EIE621 – EIE623
OR
• Research postgraduate courses offered by PolyU or other universities</td></tr>
<tr><td>HTI6081 Ethics: Research, Professional & Personal Perspectives</td><td>1 credit</td></tr>
<tr><td>EIE6200 Methodology for Engineering and Scientific Research</td><td>3 credits</td></tr>
<tr><td>EIE6201 Research Seminar (I)</td><td>1 credit</td></tr>
<tr><td>EIE6205 Practicum (I)</td><td>1 credit</td></tr>
<tr><td>EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing</td><td>3 credits</td></tr>
<tr><td colspan="2">FT Year 2 / PT Years 3 & 4</td></tr>
<tr><td>EIE6202 Research Seminar (II)</td><td>1 credit</td></tr>
<tr><td>EIE6206 Practicum (II)</td><td>1 credit</td></tr>
<tr><td colspan="2">FT Year 3 / PT Years 5 & 6</td></tr>
<tr><td>EIE6203 Research Seminar (III)</td><td>1 credit</td></tr>
<tr><td>Thesis</td><td>–</td><td>NA</td></tr>
<tr><td>Total:</td><td>12 credits</td><td>3 credits</td></tr>
</table>

Please refer to the Guided-study Subject lists at the end of this section.

5.2 Doctor of Philosophy (PhD) (Con't)

<table>
<tr><th colspan="3"><u>4-year Full-time / 8-year Part-time PhD (22 credits)</u></th></tr>
<tr><th>Year of study</th><th>Compulsory</th><th>Elective</th></tr>
<tr><td colspan="2">FT Year 1 / PT Years 1 & 2</td><td rowspan="15">9 credits, i.e. <u>3 electives</u> from:
• EIE Guided-study Subjects # EIE6811 – EIE6813
OR
• EngD Guided-study Subjects (Mode I: with accompanying MSc subject) # EIE621 – EIE623
*<u>Students are allowed to take only 1 subject from this pool</u>.
OR
• Research postgraduate courses offered by PolyU or other universities</td></tr>
<tr><td>HTI6081 Ethics: Research, Professional & Personal Perspectives</td><td>1 credit</td></tr>
<tr><td>EIE6200 Methodology for Engineering and Scientific Research</td><td>3 credits</td></tr>
<tr><td>EIE6201 Research Seminar (I)</td><td>1 credit</td></tr>
<tr><td>EIE6205 Practicum (I)</td><td>1 credit</td></tr>
<tr><td>EIE6207 Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing</td><td>3 credits</td></tr>
<tr><td colspan="2">FT Year 2 / PT Years 3 & 4</td></tr>
<tr><td>EIE6202 Research Seminar (II)</td><td>1 credit</td></tr>
<tr><td>EIE6206 Practicum (II)</td><td>1 credit</td></tr>
<tr><td colspan="2">FT Year 3 / PT Years 5 & 6</td></tr>
<tr><td>EIE6203 Research Seminar (III)</td><td>1 credit</td></tr>
<tr><td colspan="2">FT Year 4 / PT Years 7 & 8</td></tr>
<tr><td>EIE6204 Research Seminar (IV)</td><td>1 credit</td></tr>
<tr><td>Thesis</td><td>–</td><td>NA</td></tr>
<tr><td>Total:</td><td>13 credits</td><td>9 credits</td></tr>
</table>

Please refer to the Guided-study Subject lists at the end of this section.

Note: These study patterns are only indicative. Students may take the subjects according to their own pace subject to the regulations. They are recommended to consult their supervisor for advice and planning if needed.

 # Guided-study Subject lists

EIE Guided-study Subjects

- EIE6811 Guided-study in Electronic and Information Engineering I
- EIE6812 Guided-study in Electronic and Information Engineering II
- EIE6813 Guided-study in Electronic and Information Engineering III

EngD Guided-study Subjects (Mode I: with accompanying MSc subject)

- EIE621 Special Topics in Electronic and Information Engineering I
- EIE622 Special Topics in Electronic and Information Engineering II
- EIE623 Special Topics in Electronic and Information Engineering III

6. ASSESSMENT REGULATIONS

Academic regulations governing the operation and assessment of all research degree programmes can be found in the Research Handbook.

7. SYLLABI (Please see pages 17 to 33)

Subject Description Form

Subject Code	HTI6081
Subject Title	Ethics: Research, Professional & Personal Perspectives
Credit Value	1
Level	6
Pre-requisite / Co-requisite / Exclusion	None
Objective	• To equip students with a deep appreciation of ethical guidelines and codes of conduct that they can apply in their research studies at PolyU and in their future professional and personal lives.
Intended Learning Outcomes	On successful completion of this subject, students will be able to: 1. Demonstrate knowledge and understanding of the need for ethical behavior and guiding codes of ethics in research and the professions. 2. Understand, discuss and apply ethical principles and codes across a range of disciplines and scenarios 3. Demonstrate awareness of current ethical issues and problems in relation to their own discipline and research area 4. Critically analyze and discuss scenarios cases of possible or actual ethical misconduct 5. Discuss how the guiding principles of ethics in research extend and apply to business, professional and personal codes of conduct and why this important to integrity and the well being of business, the professions and our community. 6. Show a fundamental understanding of the issues of copyright, plagiarism and proper citation, and be able to apply this in their own work.
Subject Synopsis/ Indicative Syllabus	• The need for ethics training and the meaning of ethical behavior in research: case studies, disasters and learning by the mistakes of others • Philosophy and codes of ethics and their origins • Culture, religion and the law – how these relate to ethical codes of conduct • Obtaining ethical approval for a research project: procedures and processes • Ethics in life science, humanities, education, business and industry: common issues, guiding principles, discipline specific scenarios • Ethics and human behavior: individual, professional and societal responsibilities • Recent ethical issues affecting Hong Kong and the society in general • Ethical use of information in thesis writing: understanding copyright, plagiarism and proper citation
Teaching/Learning Methodology	Lecture/seminar/workshop

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. Group assignment on discipline specific scenario/case study analysis	50%	√		√			√
2. Oral presentation	30%		√		√	√	
3. Attendance	20%			√			
Total	100 %						

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

1. Discipline specific scenario/case study analysis will assess ability to identify and analyze ethical issues in the student's own discipline and to present a coherent and detailed critique and plan on how these could be avoided or resolved (giving sources and written work accompanied by a Turn-it-in Report). The group assignment will assess the student's ability to identify, discuss and analyze ethical principles and issues from a wide perspective, and evaluate how individual, professions and societies benefit from following ethically acceptable behavior and practices.
2. Oral presentation will assess the students' ability to present and argue the points in support of their rational.

Student Study Effort Required

Class contact:	
• Lecture/seminar/workshop/oral presentation	16 Hrs.
Other student study effort:	
• Self study and group work	27.5 Hrs.
• Assignment preparation	15 Hrs.
Total student study effort	58.5 Hrs.

Reading List and References

Materials from the Hong Kong Ethics development website
(http://www.icac.org.hk/hkedc/eng/library2.asp)

Materials from EthicsWeb.ca
(http://www.ethicsweb.ca/resources/professional/issues.html)

Selected readings and videos

Declaration of Helsinki (revised 2008)

Subject Description Form

Subject Code	EIE6200
Subject Title	Methodology for Engineering and Scientific Research
Credit Value	3
Level	6
Pre-requisite / Co-requisite / Exclusion	Nil
Objectives	This subject aims to equip students with the methodologies necessary for conducting engineering and scientific research. The objectives of this subject include: (i) To enable students to have a broad concept on the philosophy of research (ii) To introduce students with the methods and process for the design and formulation of a research study, as well as the different types of scientific research approaches and methods (iii) To familiarize students with the methods for validating and presenting research results
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. identify and select appropriate research problems; 2. formulate research objectives, analyze the problem, state hypotheses; 3. identify the safety and ethical issues in a research study; 4. identify, select appropriate research methods and develop process for conducting research; 5. appreciate published literature and write research paper; and 6. make professional presentations of research results and defend the propositions and claims.
Subject Synopsis/ Indicative Syllabus	Keyword Syllabus This subject provides students with the following key topics: 1. Research Philosophy and Ethics in Engineering Research Overview of research philosophy and purposes such as positivism/interpretivism, significance of research in society, etc.; importance of research ethics; professional codes and policies of research ethics in engineering; ethical decision making in research; safety considerations in research; case studies. 2. Scientific Research Methods Observation and description; cause and effect; analysis and synthesis; hypothesis, deduction, induction, testing of hypothesis; system modeling; action research, design-based approach; mathematical, modelling, and numerical computations; probability, randomness and logic. 3. Conducting a Research Process for developing research plan; formulation of research problem; feasibility and significance studies; critical review of literature; design experiments and apparatus; measurement of human information, questionnaire design; quantitative vs qualitative research or mixed methods, empirical research; classification and sampling; analysis of experimental data; errors of measurement, validity, reliability, and uncertainty analysis of research findings; reporting research results.

<table>
<tr><td></td><td>4. Writing and Presentation Techniques
Tools for preparing research document; preparing research proposal; research paper writing and style; thesis writing and style; making oral and poster presentations.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>

To help the students understand the importance of academic honesty and learn ways to ensure that the work and behavior at PolyU are acceptable, the students are required to complete the “Online Tutorial on Academic Integrity” not later than Week 5. <u>The Online Tutorial is part of the subject completion requirement. Students who fail to complete the Online Tutorial will fail this subject.</u>
Formal classroom lectures will be given to introduce the concepts in research philosophy, ethics and safety in research, scientific research methods, methodologies when conducting a research, as well as writing and presentation techniques. They support the intended learning outcome 1 to 6.
A workshop will be given to familiarize students the tools for preparing research documents. It supports the intended learning outcome 6.
Each student is required to complete a mini-project in which the student will select a problem of his/her interest, conduct a literature search, generate/collect research data, and finally prepare research papers. A mini-conference will be held at the end to allow the students to practice making oral and poster presentations of the papers they developed in the mini-project. Students will also work as the reviewer of the conference to give critical comments on the paper submissions. They support the intended learning outcome 1 to 6.

</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
In addition to the assessment methods below, the students are required to complete the “Online Tutorial on Academic Integrity” not later than Week 5. <u>The Online Tutorial is part of the subject completion requirement. Students who fail to complete the Online Tutorial will fail this subject.</u> This assessment method assesses the intended learning outcome 3.
<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>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>1. Mini-project: research proposal, research paper</td><td>45</td><td>√</td><td>√</td><td></td><td>√</td><td>√</td><td></td></tr>
<tr><td>2. Mini-conference: Oral and poster presentations, paper reviews</td><td>45</td><td></td><td></td><td></td><td></td><td>√</td><td>√</td></tr>
<tr><td>3. Case study report – Significance of research</td><td>10</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">Assessment:

Continuous Assessment 100%

Principal course assignments will include the following:

• Students will go through the whole process of a research project in a mini-project. The problem can be a well known one and should be of student's interest. Student submissions for this mini-project may include
o a research proposal
o the final research paper
Students also need to demonstrate they can use the tools taught in the class to prepare the research paper.
• Students will participate in a mini-conference in which students will make oral and poster presentations of the research papers they developed in the mini-project. Students will also work as a reviewer of a conference to make critical comments to paper submissions.
• Students will go through a critical analysis of the research they are carrying out to identify the significance in their project. Students are required to submit a case study report to discuss their findings.</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>▪ Class activity</td><td>19 Hours</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self study / Mini-project</td><td>66 Hours</td></tr>
<tr><td>Total student study effort</td><td>105 Hours</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Indicative Reading
1. Kristin Shrader-Frechette, Ethics of Scientific Research, Lanham, Md.: Rowman & Littlefield, 1994.
2. E. Bright Wilson, Jr., An Introduction to Scientific Research, New York: Dover Publications, 1990.
3. Kenneth S. Bordens and Bruce B. Abbott, Research Design and Methods - A Process Approach, 8th Edition, McGraw Hill, 2008.
4. John W. Creswell, Research Design – Qualitative, Quantitative, and Mixed Methods Approaches, SAGE, 2009.
5. John W. Creswell, Dr. Vicki L. Plano Clark, Designing and Conducting Mixed Methods Research, SAGE, 2008.
6. W. James Bradley and Kurt C. Schaefer, The Uses and Misuses of Data and Models: The Mathematization of the Human Science, SAGA Publications, Inc., 1998.
7. Mark L. Mitchell and Janina M. Jolley, Research Design Explained, 6th Edition, Thomson Wadsworth, 2007.
8. John D. Sterman, Business dynamics: Systems thinking and modeling for a complex world, McGraw-Hill, 2000.</td></tr>
</table>

Subject Description Form

Subject Code	EIE6207
Subject Title	Theoretical Fundamental and Engineering Approaches for Intelligent Signal and Information Processing
Credit Value	3
Level	6
Pre-requisite / Co-requisite/ Exclusion	The student is expected to have background knowledge of University Mathematics in his/her 1st and/or 2nd year of undergraduate studies. In particular, s/he is expected to have a fundamental understanding of basic statistics, calculus, signals and linear systems.
Objectives	The subject covers mathematical techniques and application examples applicable to electronic and information engineering, particularly in the areas of image and video technology, speech and audio processing, pattern recognition, telecommunications, opto-electronics, acoustics, and electronic circuits. After the completion of this subject, the student should acquire some good engineering approaches, mathematical and optimization techniques to carry out academic research and hi-tech R&D work in the above areas.
Intended Learning Outcomes	**Upon completion of the subject, students will be able:** Category I: Professional/academic knowledge and skills 1. to understand the theories behind the subject materials and be able to apply them for research and practical applications, including (i) matrix fundamentals, analysis and applications, (ii) probability and statistical signal processing, and (iii) engineering approaches for optimization, classifications, and estimation. 2. to master these advanced/essential techniques for modern engineering or research work, and 3. to develop efficient realization algorithms or systems for electronic and information engineering applications, which enable them to accept modern design/realization challenges in the future. Category II: Attributes for all-roundedness 4. to present ideas and findings effectively. 5. to think critically. 6. to learn independently.

Subject Synopsis/ Indicative Syllabus	**1. Matrix Analysis** • Overview of linear algebra • Eigenvalues and eigenvectors • Diagonalization of matrices • Change of basis and similarity transformations • Generalized eigenvectors/eigenvalues • Exponential function of matrix • Pseudo-inverse for non-square matrix • Singular value decomposition • Jordan canonical, Quadratic and Hermitian forms • Matrix norms and their properties • Functions of matrices • State-space representation • Solution of the state equation • Controllability and observability **2. Applications of Matrix Analysis** • Network/traffic flow analysis • Leontief input-output model analysis • Matrix fundamentals for election analysis. • Transformation, data fitting and data compression using singular value decomposition. • The controller designs using state-space methods. **3. Probability and Stochastic Processes** • Functions of random variables • Multivariate Gaussian distributions • Power spectral density • Wide-sense stationarity, strict sense stationarity. **4. Estimation and Prediction** • Maximum likelihood and Bayesian estimation. • Minimum mean square error (MMSE) estimation. • Kalman filtering **5. Machine Learning and Deep Learning** • Constrained Optimization o Equality and inequality constraints o Duality o Lagrange multipliers o Support vector machines • Clustering o K-means algorithm o Gaussian mixture models o EM Algorithm • Subspace Modeling o Principal component analysis o Linear discriminant analysis o Factor analysis • Bayesian Methods o Bayes theorem o Bayesian inference o Bayes classifiers • Deep Learning and deep neural networks o Deep neural networks o Convolutional neural networks o Stochastic gradient descent and backpropagation o Feature learning o Recurrent neural networks and LSTM

Teaching/Learning Methodology

Lectures:

Matrix analysis, probability, statistical signal processing, optimization, machine learning and deep learning are delivered to students.

Tutorials:

Students will be able to clarify concepts and to have a deeper understanding of the lecture material via tutorial questions; problems and application examples are given and discussed.

Lab Exercises:

In the lab exercises, students will have the chance to apply the deep learning concepts they learn in lectures to build AI systems. In particular, they will construct and evaluate a handwritten digit recognition system using the Nvidia Jetson TX2 Developer Kit. Students will also use the kit and a webcam to perform real-time object recognition and handwritten digit recognition. Students need to submit a lab report to discuss their findings and observations.

Teaching/Learning Methodology	**Intended Subject Learning Outcomes**					
	1	**2**	**3**	**4**	**5**	**6**
Lectures	✓	✓	✓		✓	✓
Tutorials	✓	✓	✓		✓	✓
Labs	✓	✓	✓	✓	✓	✓

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. Test	20%	✓	✓			✓	✓
2. Examination	60%	✓	✓			✓	
3. Lab	20%	✓	✓	✓	✓	✓	✓
Total	100%						

Student Study Effort Expected

Class contact:	
▪ Lecture	26 Hours
▪ Tutorial	10 Hours
▪ Lab	3 Hours
Other student study effort:	
▪ Self-study and write-up	63 Hours
Total student study effort	102 Hours

Reading List and References	**References:** 1. M.W. Mak and J.T. Chien, *Machine Learning for Speaker Verification*, Cambridge University Press, 2020. 2. S.Y. Kung, M.W. Mak and S.H. Lin, *Biometric Authentication: A Machine Learning Approach*, Prentice Hall, 2005. 3. C. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2006. 4. S.J.D. Prince, *Computer Vision: Models Learning and Inference*, Cambridge University Press, 2012. 5. M.W. Mak, "Lecture Notes on Factor Analysis and I-Vectors", *Technical Report and Lecture Note Series*, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, Feb. 2016. http://www.eie.polyu.edu.hk/~mwmak/papers/FA-Ivector.pdf 6. Sheldon Ross, *A First Course in Probability*, 6th Edition, Prentice Hall, 2002. (chapters 2 & 4-8) 7. R. D. Yates & D. J. Goodman, *Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers*, Prentice Hall, ISBN 0471178373. (chapters 6 & 10) 8. M. H. Hayes, *Statistical Digital Signal Processing and Modeling*, Wiley, 1996. ISBN-0-471-59431-8 (chapter 7.1-7.3) 9. M.J. Zaki and W. Meira Jr., *Data Mining and Analysis*, Fundamental Concepts and Algorithms, Cambridge University Press, 2014. 10. V. Britanak, P. Yip and R. Rao, *Discrete Cosine and Sine Transforms*, Academic Press, Inc., 2007. 11. G. Strang, *Introduction to linear algebra*, Vol. 3. Wellesley, MA: Wellesley-Cambridge Press, 1993. G. Strang, Introduction to Linear Algebra, 2009. 12. G. Strang, Computational Science and Engineering, 2007. 13. David C. Lay, Linear Algebra and its Applications, Fourth Edition, Pearson/Addison-Wesley, 2011. ISBN-13: 978-0321385178. 14. Roger A. Horn and Charles R. Johnson, Matrix Analysis, 2nd Edition, Cambridge University Press, 2012. 15. Selected reading from recent issues of IEEE Transactions on Image Processing, Pattern Analysis and Machine Intelligence, Circuits and System for Video Technology, Signal Processing; Pattern Recognition, Proceedings of ICASSP, ICIP, CVPR and IRE Proceedings.

Subject Description Form

Subject Code	EIE6811 – EIE6813
Subject Title	Guided Study in Electronic and Information Engineering I/II/III
Credit Value	3
Level	6
Pre-requisite/ Co-requisite/ Exclusion	Students are expected to have acquired knowledge in digital communications, power electronics, digital signal processing, microelectronics, biomedical engineering or bio-electronics equivalent to that taught in the final year of an Honours Degree in Electronic/Electrical/Information Engineering.
Objectives	This subject aims to equip students with the comprehensive knowledge in a selected research topic from the following areas in Electronic and Information Engineering: advanced communications systems, advanced power electronics, multimedia signal processing, biosensor technologies and microelectronics.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand the state-of-the-art developments and trends in a selected research topic from the following areas: advanced communications systems, advanced power electronics, multimedia signal processing, biosensor technologies and microelectronics; b. familiarize themselves with the technical knowhow and the tools for the analysis and design made in the selected research topic.
Subject Synopsis/ Indicative Syllabus	The contents of the guided study are based on any one or more research topics in the list of the area (A to E) selected by the student: A. Advanced communications systems • Wireless Communications • Wireless Networking • Communication Theory • Signal Processing for Communications • Optical Networks and Systems • Next-Generation Networking • Communication QoS, Reliability & Modeling • Ad-hoc and Sensor Networking • Communication Software and Services • Communication and Information Systems Security • Cognitive Radio and Networks B. Advanced power electronics • Power semiconductors, Power integrated circuits (PIC), passive components and packaging technologies • Motor drives and motion control • Analysis and design of electrical machines • Hard-switching and soft-switching static power converters and UPS • Applications of power electronics in power system and generation/FACTS • Power quality issues, harmonic problems and solutions • EMI/EMC issues • Traction and automotive systems • Applications of power electronics in home appliance, industry and aerospace

	• Renewable energy technologies • Distributed generation and smart-grid • Modelling and simulation in power electronics • Power electronics related education/professional development • Bio-medical power electronics • Telecommunications power supplies • Micro-electromechanical systems (MEMS) • Power electronic emerging technologies C. Multimedia signal processing • Coding and compression of multimedia signals • Multimedia for communication and collaboration • Multimedia database and data retrieval • Multimedia forensics • Client-cloud multimedia systems, applications, and experiences • Virtual reality signal processing • Scene analysis • Multimedia networking • Emerging topics in multimedia signal processing D. Biosensor technologies • Bioelectronics • Commercial biosensors, manufacturing and markets • DNA chips, nucleic acid sensors and aptasensors • Enzyme-based biosensors • Immunosensors • Lab-on-a-chip • Microfluidics and immobilisation technology • Nanobiosensors, nanomaterials & nanoanalytical systems • Natural & synthetic receptors (including MIPs) • Organism- and whole cell-based biosensors • Printed biosensors and micro- and nanofabrication • Proteomics, single-cell analysis and cancer-cell detection • Imaging and fluorescence • Signal transduction technology • Signal conditioning and measurement certainty • Theranostics & implantable sensors E. Microelectronics • Photovoltaic cells • Optoelectronic devices • Photonic devices • Organic electronics

Teaching/Learning Methodology

A student is required, under the supervision of the subject supervisor, to read specified monographs, journal publications and/or a book. The student and the subject supervisor must meet regularly to discuss the progress made by the student in the subject. Coursework in terms of literature survey reports and presentations should normally be included. At the end of the semester the student will be examined, normally both orally and in written form. All of the above contributes to both intended learning outcomes of the subject.

Alignment of learning & teaching activities with the ILOs

Teaching/Learning Methodology	Intended subject learning outcomes	
	a	b
1. Literature survey	✓	✓
2. Write-ups and presentations	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

The Coursework part will include the coursework of the study assigned by the teaching staff. The Examination part will include the written and oral examination of the study assigned by the teaching staff.

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed	
		a	b
1. Coursework (normally assignments and presentations)	45	✓	✓
2. Examination (normally both written and oral, conducted by the responsible staff and a staff member who is knowledgeable in the topic)	55	✓	✓
Total	100		

Student Study Effort Expected

Guided activities:	
▪ Meeting with the supervisor / Presentations/ Viva examination	20 Hrs.
▪ Self-study / Preparation of reports and presentation materials	85 Hrs.
Total student study effort	105 Hrs.

Reading List and References

Will be assigned by the teaching staff.

Subject Description Form

Subject Code	EIE621 – EIE623
Subject Title	Special Topics in Electronic and Information Engineering I/II/III
Credit Value	3
Level	6
Pre-requisite/ Co-requisite/ Exclusion	Students are expected to have acquired knowledge in digital communications, power electronics, digital signal processing, biomedical engineering or bio-electronics equivalent to that taught in the final year of an Honours Degree in Electronic/Electrical/Information Engineering.
Objectives	This subject aims to equip students with the comprehensive knowledge in a selected research topic from the following areas in Electronic and Information Engineering: advanced communications systems, advanced power electronics, multimedia signal processing and biosensor technologies.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand the state-of-the-art developments and trends in a selected research topic from the following areas: advanced communications systems, advanced power electronics, multimedia signal processing and biosensor technologies; b. familiarize themselves with the technical knowhow and the tools for the analysis and design made in the selected research topic.
Subject Synopsis/ Indicative Syllabus	The contents of the guided study are based on any one or more research topics in the list of the area (A to D) selected by the student: A. Advanced communications systems • Wireless Communications • Wireless Networking • Communication Theory • Signal Processing for Communications • Optical Networks and Systems • Next-Generation Networking • Communication QoS, Reliability & Modeling • Ad-hoc and Sensor Networking • Communication Software and Services • Communication and Information Systems Security • Cognitive Radio and Networks B. Advanced power electronics • Power semiconductors, Power integrated circuits (PIC), passive components and packaging technologies • Motor drives and motion control • Analysis and design of electrical machines • Hard-switching and soft-switching static power converters and UPS • Applications of power electronics in power system and generation/FACTS • Power quality issues, harmonic problems and solutions • EMI/EMC issues • Traction and automotive systems

	• Applications of power electronics in home appliance, industry and aerospace • Renewable energy technologies • Distributed generation and smart-grid • Modelling and simulation in power electronics • Power electronics related education/professional development • Bio-medical power electronics • Telecommunications power supplies • Micro-electromechanical systems (MEMS) • Power electronic emerging technologies C. Multimedia signal processing • Coding and compression of multimedia signals • Multimedia for communication and collaboration • Multimedia database and data retrieval • Multimedia forensics • Client-cloud multimedia systems, applications, and experiences • Virtual reality signal processing • Scene analysis • Multimedia networking • Emerging topics in multimedia signal processing D. Biosensor technologies • Bioelectronics • Commercial biosensors, manufacturing and markets • DNA chips, nucleic acid sensors and aptasensors • Enzyme-based biosensors • Immunosensors • Lab-on-a-chip • Microfluidics and immobilisation technology • Nanobiosensors, nanomaterials & nanoanalytical systems • Natural & synthetic receptors (including MIPs) • Organism- and whole cell-based biosensors • Printed biosensors and micro- and nanofabrication • Proteomics, single-cell analysis and cancer-cell detection • Imaging and fluorescence • Signal transduction technology • Signal conditioning and measurement certainty • Theranostics & implantable sensors

Teaching/Learning Methodology

The subject can be conducted via guided study in two modes for individual students. Mode I requires a student to take an MSc subject related to the topics of the guided study subject or a relevant short course as the basis of the guided study subject. The student will be required to participate fully in the MSc subject/relevant short course (i.e. attend all the lectures, complete both the coursework and examination requirements). To bring the subject up to the doctoral level, a student is required to submit further write-ups and presentations. An overall grade for the guided study subject is then derived from the result of the MSc subject as well as the extra writes-up and presentations. Mode II is operated for guided study subjects with no relevant MSc subject/short course available. A student is required, under the supervision of the subject supervisor, to read specified monographs, journal publications and/or a book. The student and the subject supervisor must meet regularly to discuss the progress made by the student in the subject. Coursework in terms of literature survey reports and presentations should normally be included. At the end of the semester the student will be examined, normally both orally and in written form. All of the above contributes to both intended learning outcomes of the subject.

Alignment of learning & teaching activities with the ILOs (Mode I)

Teaching/Learning Methodology	Intended subject learning outcomes	
	a	b
1. Lectures	✓	✓
2. Tutorials / Laboratories	✓	✓
3. Literature survey	✓	✓
4. Write-ups and presentations	✓	✓

Alignment of learning & teaching activities with the ILOs (Mode II)

Teaching/Learning Methodology	Intended subject learning outcomes	
	a	b
5. Literature survey	✓	✓
6. Write-ups and presentations	✓	✓

<table>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
For Model I study, it includes the courseworks and examination of an MSc subject and additional assignments given by the teaching staff. The additional assignments include write-ups and presentations.
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="2">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td></tr>
<tr><td>1. MSc subject
(include coursework and examination)</td><td>67</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Additional assignments
(include write-ups and presentations)</td><td>33</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100</td><td colspan="2"></td></tr>
</table>
For Mode II study, the Coursework part will include the coursework of the study assigned by the teaching staff. The Examination part will include the written and oral examination of the study assigned by the teaching staff.
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="2">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td></tr>
<tr><td>1. Coursework
(normally assignments and presentations)</td><td>45</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Examination
(normally both written and oral, conducted by the responsible staff and a staff member who is knowledgeable in the topic)</td><td>55</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100</td><td colspan="2"></td></tr>
</table>
</td></tr>
<tr><td>Student Study Effort Expected
(Mode I)</td><td>
<table>
<tr><td>Class contact (time-tabled):</td><td></td></tr>
<tr><td>▪ Lecture</td><td>24 Hrs.</td></tr>
<tr><td>▪ Tutorial/Laboratory/Practical Classes</td><td>15 Hrs.</td></tr>
<tr><td>Guided activities:</td><td></td></tr>
<tr><td>▪ Meeting with the supervisor / Presentations/ Viva examination</td><td>10 Hrs.</td></tr>
<tr><td>▪ Self-study / Preparation of reports and presentation materials</td><td>56 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>105 Hrs.</td></tr>
</table>
</td></tr>
</table>

(Mode II)	Guided activities:	
	▪ Meeting with the supervisor / Presentations/ Viva examination	20 Hrs.
	▪ Self-study / Preparation of reports and presentation materials	85 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	Will be assigned by the teaching staff.	