MSc Student Handbook
2018-2019

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

THE UNIVERSITY OF HONG KONG

© Department of Electrical & Electronic Engineering, The University of Hong Kong
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### Foreword

This Handbook contains detailed information on the taught postgraduate programmes offered by the Department of Electrical and Electronic Engineering.

The missions of the Department are to produce the highest quality of graduates to satisfy the society needs, to advance the bounds of scholarship and to conduct leading edge research. The goals of the Department are to strive for excellence in teaching, research and in professional service.

The philosophy of education in the Department is to provide you with a life-long learning capability. The curricular for different programmes, although emphasis has been placed on different aspects of electrical and electronic engineering, do have a common thread in providing you with a fundamental understanding as well as an up-to-date grasp of cutting edge advanced technologies of this important field.

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**Department of Electrical and Electronic Engineering**

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1. Introduction to the Department of Electrical and Electronic Engineering (EEE)

1.1 The Department

The Department of Electrical and Electronic Engineering (EEE) was established in late fifties as a major department in the Faculty of Engineering at the University of Hong Kong. Its graduates have served the society since 1961 and have been making tremendous impact to the well-being and development of Hong Kong in her infancy years. Over the years, power systems, electronic, computers and information processing have evolved at dazzling speed, and have permeated to every aspect of life and the society at large.

EEE has naturally progressed with time and has grown from the relatively obscured location along Pokfulam Road to the current modern high rise of the Chow Yei Ching Building with numerous satellite laboratories located as well at the Haking Wong Building, Yam Pak Building and Composite Building. It is located on LG2, LG3, 1st, 2nd, 5th, 6th, 7th and 8th floor of the Chow Yei Ching Building, 3rd floor of the Haking Wong Building, 4th floor of the Yam Pak Building and CP-1 of the Composite Building.

EEE offers the B.Eng. degree in Electrical Engineering, B.Eng. degree in Electronic Engineering, B.Eng. degree in Computer Engineering (jointly run with the Department of Computer Science) and B.Eng. degree in Biomedical Engineering (BME) (jointly run with the Faculty of Engineering, the Department of Mechanical Engineering and the LKS Faculty of Medicine). These programmes are accredited by the Hong Kong Institution of Engineers (HKIE). The Department also offers the degree of Master of Science in Engineering (M.Sc.(Eng.)) in Electrical and Electronic Engineering and jointly offers the degrees of M.Sc. (Eng.) in Building Services, M.Sc. (Eng.) in Energy Engineering and M.Sc. in Electronic Commerce and Internet Computing with the other Engineering Departments in the Faculty. These courses have well-structured programmes of study spanning over twenty-four months.

Currently over 170 research students are studying for the Ph.D and M.Phil degrees in EEE and most of them are financially supported through Postgraduate Studentships, Teaching Assistantships or Research Assistantships. Currently, there are a total of 41 academic staff and 32 supporting staff.

1.2 Teaching Staff

Among the 41 teaching staff of the department, there are 5 Chair Professors, 10 Professors, 23 Associate Professors/Assistant Professors/Principal Lecturers/Lecturers, and 3 Research Assistant Professors. Professor K.T. Chau is the head of Department. The 5 Chair Professors are: Professor D.J. Hill (Chair of Electrical Engineering), Professor R.S.Y. Hui (Chair of Power Electronics), Professor V.O.K. Li (Chair of Information Engineering), Professor E.X. Wu (Chair of Biomedical Engineering ), and Professor N.C. Tien (Chair of Microsystems Technology).

The teaching staff members are:
2. Taught Postgraduate Programme Syllabuses

2.1 SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING IN ELECTRICAL AND ELECTRONIC ENGINEERING (MSC(ENG)(EEE))

(This syllabus is applicable to students admitted to the curriculum in the academic year 2016-2017 and thereafter)

Definition and Terminology

Discipline course – any course on a list of courses in the discipline of curriculum which a candidate must pass at least a certain number of credits as specified in the Regulations.

Elective course – any course offered by the Departments of the Faculty of Engineering for the fulfilment of the curriculum requirements of the degree of MSc(Eng) in Electrical and Electronic Engineering that are not classified as discipline courses.

Capstone Experience – a 24-credit dissertation which is a compulsory and integral part of the curriculum.

Curriculum Structure

Candidates are required to complete 72 credits of courses as set out below, normally over one academic year of full-time study or two academic years of part-time study:

<table>
<thead>
<tr>
<th>Course Category</th>
<th>No. of Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline Courses</td>
<td>Not less than 30</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>Not more than 18</td>
</tr>
<tr>
<td>Capstone Experience</td>
<td>24</td>
</tr>
</tbody>
</table>

Total | 72

Candidates shall select courses in accordance with the regulations of the degree. Candidates must complete 8 courses and a dissertation. They may select no more than 3 courses from the other taught postgraduate curricula in the Faculty of Engineering as electives. All course selection will be subject to approval by the Course Coordinators.

Candidates are required to follow the prescribed curriculum of one of the three streams: General Stream, Communications Engineering and Power Engineering, each comprising a 24-credit dissertation and at least 5 discipline courses selected from subject group A, B or C. To qualify as a graduate of the Communications Engineering Stream, candidates must pass at least 5 discipline courses in the Communication Engineering subject group. To qualify as a graduate of the Power Engineering Stream, candidates must pass at least 5 discipline courses in the Power Engineering subject group. For the General Stream, candidates may choose from any of the three subject groups. The Department also offers an optional course in the Professional Development subject group, namely ELEC7900 Engineering and Society, which will not be counted for the fulfilment of the curriculum requirements and the classification of award of the degree.

The following is a list of discipline courses offered by the Department of Electrical and Electronic Engineering. The list below is not final and some courses may not be offered every year.

All courses are assessed through examination and/or coursework assessment, the weightings of which are subject to approval by the Board of Examiners.
Subject Groups

A. General
ELEC6008  Pattern recognition and machine learning
ELEC6027  Integrated circuit systems design
ELEC6036  High performance computer architecture
ELEC6043  Digital image processing
ELEC6049  Digital system design techniques
ELEC6063  Optoelectronics and lightwave technology
ELEC6067  Magnetic resonance imaging (MRI) technology and applications
ELEC6079  Biomedical ultrasound
ELEC6081  Biomedical signals and systems
ELEC6092  Green project management
ELEC6105  Magnetics engineering for data storage and emerging applications
ELEC6601  Industrial marketing
ELEC6602  Business venture in China
ELEC6603  Success in industrial entrepreneurship
ELEC6604  Neural networks, fuzzy systems and genetic algorithms
ELEC7078  Advanced topics in electrical and electronic engineering
ELEC7079  Investment and trading for engineering students
ELEC7080  Algorithmic trading and high frequency trading
ELEC7081  Advanced topics in computational finance

B. Communications Engineering
ELEC6006  Communications policy and regulations
ELEC6026  Digital signal processing
ELEC6065  Data compression
ELEC6080  Telecommunications systems and management
ELEC6097  IP networks
ELEC6098  Electronic and mobile commerce
ELEC6099  Wireless communications and networking
ELEC6100  Digital communications
ELEC6103  Satellite communications
ELEC7051  Advanced topics in communication theory and systems
ELEC7077  Advanced topics in multimedia signals and systems

C. Power Engineering
ELEC6055  Power system distribution
ELEC6084  Power delivery management for metropolitan cities
ELEC6085  The role of a computerized SCADA system in power system operation
ELEC6095  Smart grid
ELEC7402  Advanced electric vehicle technology
ELEC7403  Advanced power electronics
ELEC7456  Advanced power system operation
ELEC7466  Advanced topics in power system engineering
MEBS6001  Electrical installations
MEBS6019  Extra-low-voltage electrical systems in buildings

D. Professional Development
ELEC7900  Engineering and society
(This course will not be counted for the fulfilment of the curriculum requirements and the classification of award of the degree.)

2.2 SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING IN ENERGY ENGINEERING
MSC(ENG)(EnergyE)
(This syllabus is applicable to students admitted to the curriculum in the academic year 2016-2017 and thereafter)

Definition and Terminology
Discipline course – any course on a list of courses in the discipline of curriculum which a candidate must pass at least a certain number of credits as specified in the Regulations.
Elective course – any course offered by the Departments of the Faculty of Engineering for the fulfilment of the curriculum requirements of the degree of MSc(Eng) in Energy Engineering that are not classified as discipline courses.
Capstone Experience – a 24-credit dissertation which is a compulsory and integral part of the curriculum.

Curriculum Structure
Candidates are required to complete 72 credits of courses as set out below, normally over one academic year of full-time study or two academic years of part-time study:

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<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

Candidates shall select courses in accordance with the regulations of the degree. Candidates are required to follow a prescribed curriculum comprising a 24-credit dissertation and another 8 courses, including at least 5 discipline courses from the List of Discipline Courses (including at least 2 fundamental courses). They may select no more than 3 courses offered by other taught postgraduate curricula in the Faculty of Engineering as electives. All course selection will be subject to approval by the Course Coordinators.

List of Discipline Courses for MSc(Eng) in Energy Engineering

Fundamental courses (select at least two out of three):
EMEE6002  Sustainability and climate change (fundamental)
EMEE6005  Renewable energy technology I: Fundamental (fundamental)
EMEE6010  Electricity quality and energy efficiency (fundamental)
ELEC7402  Advanced electric vehicle technology
EMEE6003  Nuclear energy
EMEE6004  Energy conservation and management
EMEE6006  Renewable energy technology II: Advanced
EMEE6007  Energy and carbon audit
EMEE6008  Green project management
EMEE6009  Green facilities management
EMEE6011  Energy saving lighting
MEBS6016  Energy performance of buildings
MECH7011  Applied thermodynamics and power plant technology
3. Assessment

The components for assessment normally include coursework and examination of which the passing mark is 50%. The weighting of components is however different for individual courses. Details are available on the Department Intranet (Student) at:

https://intranet.eee.hku.hk/student/uploadMain.asp?dir=/WU003/WU006&sortby=title

A student who failed to pass 12 credits in an academic year may be recommended for discontinuation of studies. A student who has failed to satisfy the examiners in his/her dissertation may be required to submit or resubmit a dissertation on the same subject within a specified period. If a student has failed to satisfy the examiners at a second attempt in his/her dissertation within the specified period shall be recommended for discontinuation of studies.

The official regulations and syllabuses for the MSc programmes are available at:
http://engg.hku.hk/admissions/MSc/Curriculum-Structure-Duration

4. Capstone Experience

4.1 Requirement

Each student is required to complete

i) a dissertation under the supervision of an appropriate teacher(s) in this department
and
ii) attend and satisfactorily complete a capstone workshop in his/her respective stream/programme.

The overall performance of capstone will be solely determined by the dissertation. Students failing in fulfilling the requirement (including attendance) of the workshop will need to be re-assessed or re-take the workshop.

The details of the workshops are as follows

**MSc(Eng) in EEE (Power Engineering Stream) (choose one of the following)**
1. Power Systems Simulation
2. Power Electronics Simulation

**MSc(Eng) in EEE (Communications Engineering and General Stream) (choose one of the following)**
1. Embedded System using Field Programming Gate Arrays (FPGA)
2. Apps Programming

**MSc(Eng) in EnergyE**
Simulation Techniques for Renewable Energy Systems

The workshops will normally be held in Part I Lab (LG-205, Chow Yei Ching Building) in the first 6 weeks of the first and second semesters (depending on the total number of students enrolled). In general, full-time students are given preference to take the workshop in the first semester while part-time students are given preference to take the workshop in the second semester. Details of re-assessment will be announced by instructors of the workshop.

4.2 Enrollment of Dissertation

Students should first enroll in a dissertation capstone workshop (ELEC7021/EMEE7001) of their respective stream/programme in the online enrollment system. Meanwhile, students may contact the appropriate supervisors directly for more details about the dissertation or for self-proposed dissertation. Please visit the following link for possible dissertation topics offered by the EEE Department.

http://intranet.eee.hku.hk/mscproject/projlist.asp

The list will be updated by approximately in the middle of September each year. If both the supervisor and student agree to work on a given dissertation, the student should complete and return a dissertation supervisor confirmation form (which can be downloaded in the following link) to the Department.

MSc(Eng) in EEE / MSc(Eng) in EnergyE Dissertation Supervisor Confirmation Form & Guidelines
4.3 Assessment of Dissertation

The dissertation is assessed by a supervisor and a second examiner. To improve the assessment process of dissertation, the following measures will be implemented:

1. Students are encouraged to show initiatives in their dissertation work with constant feedback from supervisors. It is suggested that each dissertation student should meet his/her supervisor(s) formally at least once per month to report the progress and discuss future work plan.

2. Students are not allowed to change their supervisor after one semester unless there is a special reason which would be considered on a case-by-case basis.

3. The minimum duration for a student to complete the MSc dissertation should be two semesters.

4. There will be a compulsory mid-term review for each MSc dissertation student:
   a) It should be taken place three months after he/she has submitted the application for taking dissertation; and the earliest time for the student to submit his/her dissertation is three months after the completion of the mid-term review.
   b) Marks should be given for the mid-term review and it would weigh a maximum of 20% out of 100% towards the whole dissertation.

5. Upon completion of the dissertation work, each student is required to submit a dissertation. For submission of the final dissertation, the students are required to submit two hardcopies and upload the softcopy to the Department (http://appsvr.eee.hku.hk/mscproj/default.htm) and HKU Moodle (Maximum File Size: 20MB). Moreover, it is required to give an oral presentation at the end of the dissertation for assessment.

Moreover, the University and the Department view plagiarism as a serious academic misconduct: the provisions of paragraph 2(1)(g) of Statute XXXI, Powers of the Senate’s Disciplinary Committee, specify the offence while the provisions of paragraph 4 of Statute XXXI empowers the imposition of heavy penalties, including expulsion from the University.

To uphold academic integrity in MSc dissertation in terms of avoiding plagiarism, the Department has adopted the following procedures:

1. Students will be asked to submit their dissertation draft to the plagiarism checking system, “Turnitin”, about two weeks before the deadline for submission of the final version of their dissertation. Students are allowed to submit their dissertation to “Turnitin” as many times as needed until they consider that there is no plagiarism in the report (i.e. All similarity scores for individual primary sources are less than 1%).

2. Upon submission of the final version of the dissertation, if there are any similarity scores exceeding 1%, the Department will examine the highlighted similarities and check whether the sentences concerned are in the main body of the report instead of materials such as titles of papers in the references. The respective dissertation supervisor will also be invited to study the case and to recommend whether the student has really committed plagiarism or the case is just a false alarm. If the student is found to commit plagiarism in the final version of the dissertation, the student will receive zero mark for his/her final dissertation.

3. Where the case of repeated plagiarism is substantiated, the name of the student will be forwarded to the University Disciplinary Committee via the Department Head, with additional penalty.

5. Plagiarism

Policy and Procedures

1. Plagiarism is defined as the unacknowledged use, as one’s own, of work of another person, whether or not such work has been published. Acts of plagiarism include copying parts of a document in whatever media, using or extracting another person’s concepts, experimental results or conclusions, and in the context of our coursework, submitting substantially the same final version of reports or assignments.

2. The Department subscribes to the basic concept that students should receive due credit for their own efforts, and regards copying as an act of gross unfairness. Hence, it is committed to stamping out the practice of any form of plagiarism, which will attract appropriate penalties.

3. It should be noted students who willingly provide the source for copying encourage plagiarism and will be penalized in the same light.

4. In fact, the University views plagiarism as a serious academic misconduct: the provisions of paragraph 2(1)(g) of Statute XXXI, Powers of the Senate’s Disciplinary Committee, specify the offence while the provisions of paragraph 4 of Statute XXXI empowers the imposition of heavy penalties, including expulsion from the University.

5. The following procedures and guidelines are drafted to implement the policy with regard to practical work, in-course assessment and examination. These are to be made known to all students at the commencement of the semester.

(a) Procedures

1. Where a teacher/demonstrator/TA suspects plagiarism in any submitted works, be they the plagiarized ones or the source materials, he should notify the lecturer-in-charge who will decide on the available evidence whether plagiarism is seen to be committed.

2. When the lecturer-in-charge is convinced of a likely plagiarism case beyond reasonable doubt, a mark penalty will be imposed according to the guidelines. A warning letter will be sent to the student, notifying him of the decision and its consequence, and at the same time advising him of the appeal process. A copy of the warning letter will be kept in the student’s personal file.

3. Cases of repeated plagiarism are to be reported to the Department Head, who may refer the case to the University.

4. Where an appeal is made, a panel consisting of the lecturer-in-charge, a student representative, other Internal Examiners, and if applicable, the demonstrator/TA will be formed. The panel will interview the student concerned and decide on the case.

(b) Penalty Guidelines

1. If a student is found engaged in plagiarism for the first time, then his particular work in question (such as an experiment report, assignment, exercise or examination/test) will be awarded a mark of zero percent.

2. Where the case of repeated plagiarism is substantiated, the student’s name will be forwarded to the University Disciplinary Committee via the Department Head, in additional to the penalty as stated in (1).

Further information regarding the “Turnitin” system and plagiarism can be found at: http://lib.hku.hk/turnitin/
6. Duration of Study

The M.Sc. (Eng.) programme is offered in part-time and full-time modes. For the part-time mode of study, the curriculum shall normally take two academic years of study, and the maximum period of study is three years. For the full-time mode of study, the curriculum shall normally take one academic year of very intensive study and the maximum period of study is two years.

Classes are usually conducted in weekday daytime or evenings from 7:00 p.m., or during weekends.

We have 3 semesters in an academic year, i.e. Semester 1: September – December, Semester 2: January – May and Summer semester: June – August.

7. Student Communications and Feedback

Important information to be communicated with students is usually done through emails, letters and the official MSc or departmental webpage. On the other hand, students can download the teaching materials from or upload course assignments to the MOODLE system of the university.

The Department is committed to providing the best possible quality teaching and learning by collecting students’ feedback via the University’s Student Learning Experience Questionnaire (SLEQ) conducted for the final-year students of the taught postgraduate programmes and the Student Evaluation of Teaching and Learning (SETL) conducted for all students.

Moreover, student representative(s) from the MSc programmes will be invited to join the Staff-Student Consultative Committee to discuss issues arising in regular meetings. The Department will then discuss these issues at the departmental meetings.

8. Computer Facilities and Common Room

In addition to the computer facilities provided by the University, MSc students are also supported by the Department with computer facilities available in Computing Lab (Room 103, Chow Yei Ching Building) and a common room (Room 205, Chow Yei Ching Building) for students and teachers to come together to interact.