THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

FACULTY OF
ENGINEERING
工程學院
WHERE CONCEPTS BECOME REALITY

Postgraduate Scheme In
Engineering

Programme Requirement Document

September 2021

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This Programme Requirement Document is applicable for 2021-22 intakes. It 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.
[This Programme Requirement Document is posted at https://www.polyu.edu.hk/feng/05002/   ]

For ease of reading only the masculine pronoun has been used throughout this booklet. Women staff members and students should not take the omission of 'she', 'her' or 'hers' as being other than an editorial convenience.

1. General Information

1.1 Programme Title

Postgraduate Scheme in Engineering

1.2 Programme Code

05002

1.3 Mode of Study

Mixed-Mode

This programme of study provides an option for students to engage in a full-time (9 credits or more per semester) or part-time study load (less than 9 credits per semester). Full-time students normally take 3 to 5 subjects in a semester, and part-time students usually take 2 subjects. Students may have their study load vary from semester to semester which will accordingly affect their entitlement to University's services.

1.4 Host and Contributing Departments

The Postgraduate Scheme in Engineering *(Pg Scheme)* is hosted by the Faculty of Engineering(FENG). Contributing departments include:

- Electrical Engineering(EE)
- Electronic and Information Engineering(EIE)
- Mechanical Engineering(ME)

1.5 Normal Duration

Award	Full-time	Part-time
Master of Science (MSc)	1.5 years (3 semesters)	2.5 years (5 semesters)

For students admitted in or after 2020/21, they should complete the programme within the normal duration of the programme. Those who exceed the normal duration of the programme will be de-registered from the programme unless prior approval has been obtained from relevant authorities. Refer to Section 6 of the Appendix on Scheme Regulations for details.

1.6 Fund Type

Self-financed

1.7 Final Awards

Upon successful completion of the required content of the respective awards, students will graduate with a Master of Science Degree (MSc). The Scheme currently offers the following awards:

- MSc in Electrical Engineering
- MSc in Electrical Engineering *with a specialism in Electrical Power Systems*
- MSc in Electrical Engineering *with a specialism in Power Electronics and Drives*
- MSc-in Electrical Engineering *with a specialism in Railway Systems*

- MSc-in Electronic and Information Engineering
- MSc in Electronic and Information Engineering *with a specialism in Internet of Things*
- MSc in Electronic and Information Engineering *with a specialism in Multimedia Signal Processing and Communications*

- MSc in Mechanical Engineering
- MSc in Mechanical Engineering *with a specialism in Aeronautical Engineering*
- MSc in Mechanical Engineering *with a specialism in Air/Noise Pollution Management*
- MSc in Mechanical Engineering *with a specialism in Aviation*
- MSc in Mechanical Engineering *with a specialism in Product Development and Analysis*

Note: Students may apply to exit the MSc programme with a Postgraduate Diploma (PgD), subject to meeting the specified requirements.

1.8. Entrance Requirements

General Entrance Requirements

For admission to a Master's degree, the basic requirement is a Bachelor's degree from an institution that is recognised by PolyU. In addition, applicants must meet the entrance requirements as specified by individual programmes on P.6 - 19.

English Language Requirement

Applicants who are not native speakers of English, and the Bachelor's degree or equivalent qualification is awarded by institutions where the medium of instruction is not English, they are expected to fulfil the following minimum English language requirement:

(a) A Test of English as a Foreign Language (TOEFL) score of 80 for the Internet-based test or 550 for the paper-based test; OR

(b) An overall Band Score of at least 6 in the International English Language Testing System (IELTS).

Individual cases will be considered on their own merit by the departments concerned. Applicants may be required to attend interviews or tests to further demonstrate their language proficiency.

1.9 Graduation Requirements

A student would be eligible for award if he satisfies all the conditions listed below:

(a) Accumulation of the requisite number of credits – 30 for MSc; 18 for PgD exit award; and

(b) Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award he is currently enrolled, unless the professional bodies stipulate otherwise; and

(c) Satisfying all requirements as defined for the respective awards and as specified by the University; and

(d) Having a Grade Point Average (GPA) of 1.70 or above at the end of the programme; and

(e)   Having successfully completed the Online Tutorial on Academic Integrity (see below).

Online Tutorial on Academic Integrity – A mandatory requirement for graduation

To help students understand the importance of academic honesty and learn ways to ensure that their work and behaviour at PolyU are acceptable in this regard, students admitted to the Scheme in 2014/15 and beyond will be required to complete an Online Tutorial on Academic Integrity on a <u>mandatory</u> basis. Students need to complete the Tutorial preferably by Week 5 and the latest by end of the first semester they are admitted to the programme. Students without completing the Tutorial successfully will not be considered for graduation.

The Online Tutorial can be accessed on LEARN@PolyU (理學網). It takes approximately two hours to complete.   Detailed information and instructions about the tutorial are posted at *"Student Guide on Online Tutorial on Academic Integrity"*.
 https://www.polyu.edu.hk/ogur/docdrive/Academic_Integrity/Student_Guide.pdf

1.10   Application for Graduation

Application for Postgraduate Diploma exit award

Students who wish to exit the programme with a PgD should submit an application via Form AR84c in the semester they want to do so.

Application to graduate with a specialism

Students who wish to graduate from the MSc award with a specialism *(the specialism study options currently offered are listed under Section 1.7 above)* should apply for graduation via Form AR84c in the semester they deem having satisfied the award requirements concerned.

Students should refer to the Student Handbook for the application deadline stipulated for each semester. Applications for graduation will be considered by the Scheme's Board of Examiners in each semester and the results will be conveyed to students via eStudent (Examination Result Notification).   Students will NOT be informed separately of the application results. Students who are unsuccessful in the application should submit another application for graduation in subsequent semester/academic year.

Students can download Form AR84c at
https://www.polyu.edu.hk/ar/web/en/for-polyu-students/application-forms/index.html

1.11   Credit Fee

HK$4,100 (local students) / $5,300 (non-local students)

1.12   Summer Term Teaching

The Scheme does not have a mandatory Summer Term.

1.13   Daytime and Evening Teaching

Subjects will be offered predominately in the evenings. Some subjects may be made available in daytime. In general, each subject requires a 3-hour class per week over a 13-week semester.

2.   **Aims and Outcomes**

2.1   University Mission

The Scheme is able to fufil the University mission of:

2.1.1   To pursue impactful research that benefits the world.

2.1.2   To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.

2.1.3   To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

2.2   Programme Aims

Depending on needs, a student's selected programme of study can be designed for one or more of the following:

2.2.1   an in-depth treatment of an area beyond the student's first degree level in the same area;

2.2.2   updating of the knowledge of those engaged in a field especially where the discipline at undergraduate level is subject to rapid expansion or change;

2.2.3   a re-orientation or conversion to areas new to the student (in that it is in an area not directly related to the student's first degree); and

2.2.4   a synthesis and integration of a number of disciplines or subjects, particularly if the combination cannot be pursued adequately at undergraduate level.

Each programme offered within the Pg Scheme addresses the needs of its own profession. Please refer to the respective programme entries on *P. 6 - 19* for details.

2.3   Programme Outcomes

Programme outcomes refer to the intellectual abilities, knowledge, skills and attributes that a graduate from the programme should possess. Each programme offered within the Pg Scheme has its unique learning outcomes. Please refer to the respective programme entries on *P. 6 - 19* for details.

2.4   Relationship between University Mission and Programme Aims/Outcomes

Please refer to the respective programme entries on *P. 6 – 19* for details.

2.5   Relationship between Programme Outcomes and Subjects

Please refer to the respective programme entries on *P. 6 - 19* for details.

3. Curriculum Structure

3.1 To be eligible for the award of an MSc, students need to successfully complete 30 credits. To be eligible for the exit award of a PgD, students need to successfully complete 18 credits.

3.2 Each award has stipulated the requisite number of *compulsory* and/or *core* subjects, as detailed on P.20 – 22. For *elective* subjects, they are subjects that students may choose from the available subjects within this Scheme, or outside this Scheme. Students would be informed of the choices during the online subject registration exercise of each semester. Please refer to the respective programme entries on *P. 6 - 19* for the pool of stipulated *compulsory* and/or *core* subjects. Not all subjects as listed are offered each year. The subject offering departments have the complete discretion in determining the offer schedule.

3.3 Subject syllabi for compulsory and core subjects are given in *Part II.*

4. Assessment Regulations

Academic regulations governing the Scheme are given in *Appendix*.

5. Student Counselling

The Chairman of Award Committees are available to answer questions and provide advice. Their contact numbers and email addresses are given below.

6. Staff of the Scheme

Scheme Chairman: Prof. Francis Lau
Professor
Department of Electronic and Information Engineering
Tel. 2766 6206
Email: francis-cm.lau@polyu.edu.hk

Chairman of Award Committee:

MSc in	Award Chairmen
Electrical Engineering	Prof. Aping Zhang Professor Department of Electrical Engineering *Tel. 3400 3336 Email: aping.zhang@polyu.edu.hk*
Electronic and Information Engineering	Prof. Changyuan Yu Professor Department of Electronic and Information Engineering *Tel. 2766 6258 Email: changyuan.yu@polyu.edu.hk*
Mechanical Engineering	Dr Yao Haimin Associate Professor Department of Mechanical Engineering *Tel. 2766 7817 Email: haimin.yao@polyu.edu.hk*

Master of Science in Electrical Engineering

The programme also provides three specialisms of study option:

- MSc in Electrical Engineering (Electrical Power Systems)
- MSc in Electrical Engineering (Power Electronics and Drives)
- MSc in Electrical Engineering (Railway Systems)

1. **Programme Aims**

   (a) To strengthen the professional knowledge of electrical engineers involved in engineering activities in the power utilities, electricity utilization industries, railway systems, government organizations and consultancy companies;

   (b) To provide in-depth study of the state-of-the-art developments in specialist areas of electrical engineering: power systems engineering; industrial utilization and power electronics; railway system; energy sources and planning; control and automation; and optoelectronics;

   (c) To develop an understanding of the integration between advanced technologies (such as computer technology and communications) and the traditional branches of electrical engineering; and

   (d) To provide an opportunity for supplementing the core areas of electrical engineering study with topics in management, information science and related engineering fields.

2. **Relationship of Programme Aims to University Mission**

   The University has the following mission:

   (a) To pursue impactful research that benefits the world.

   (b) To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.

   (c) To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

   The following table illustrates the relationship between programme aims and University mission:

Programme Aims	University Mission		
	(a)	(b)	(c)
(a)	√	√	
(b)	√	√	
(c)	√	√	√
(d)	√	√	√

3. **Institutional Learning Outcomes**

The institutional learning outcomes for taught postgraduate programmes are:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates of PolyU taught postgraduate programmes will possess in-depth knowledge and skills in their area of study and be able to apply their knowledge and contribute to professional leadership.

(b) **Strategic thinking:** Graduates of PolyU taught postgraduate programmes will be able to think holistically and analytically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions.

(c) **Lifelong learning capability:** Graduates of PolyU taught postgraduate programmes will have an enhanced capability for continual professional development through inquiry and reflection on professional practice.

4. **Intended Learning Outcomes of the Programme**

The programme has the following intended learning outcomes:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates will possess state-of-the-art knowledge and skills in the areas within electrical engineering and be able to apply their knowledge. They will have the readiness for assuming a leadership role in their field of practice.

(b) **Design capability:** Graduates will develop an ability to design an electrical system, component, or process to meet desired needs within realistic constraints such as technical, economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

(c) **Critical and creative thinking:** Graduates will be able to think holistically and/or strategically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions to novel problems.

(d) **Lifelong learning capability:** Graduates will develop recognition of the need for, and an ability to engage in life-long learning.

5. **Relationship of Intended Learning Outcomes to Programme Aims**

The following table illustrates the relationship between intended learning outcomes and programme aims:

Intended Learning Outcomes	Programme Aims			
	(a)	(b)	(c)	(d)
(a)	√	√	√	√
(b)	√	√		
(c)	√	√		
(d)	√			√

6. Relationship of Intended Learning Outcomes of the Programme to Institutional Learning Outcomes

Intended Learning Outcomes	Institutional Learning Outcomes		
	(a)	(b)	(c)
(a)	√		
(b)	√		
(c)		√	
(d)			√

7. Curriculum Map

The curriculum map shown below indicates how each intended learning outcomes of the programme is addressed by the constituent subjects.

Core Subjects	Intended Learning Outcomes			
	(a) Professional competence	(b) Design capability	(c) Critical & creative thinking	(d) Lifelong learning capability
EE501 Alternative Energy Technologies	√		√	√
EE502 Modern Protection Methods	√	√	√	√
EE505 Power System Control and Operation	√	√	√	√
EE509 High Voltage Engineering	√	√	√	√
EE510 Electrical Traction Engineering	√		√	√
EE512 Electric Vehicles	√		√	√
EE514 Real Time Computing	√		√	√
EE517 Fibre Optic Components	√	√	√	√
EE520 Intelligent Motion Systems	√	√	√	√
EE521 Industrial Power Electronics	√	√	√	√
EE522 Optical Fibre Systems	√	√	√	√
EE524 Open Electricity Market Operation	√		√	√
EE526 Power System Analysis and Dynamics	√	√	√	√
EE527 Auto-tuning for Industrial Processes	√	√	√	√
EE528 System Modelling and Optimal Control	√	√	√	√
EE530 Electrical Energy Saving Systems	√	√	√	√
EE533 Railway Power Supply Systems	√	√	√	√
EE535 Maintenance and Reliability Engineering	√		√	√
EE536 Signalling and Train Control Systems	√	√	√	√
EE537 Railway Vehicles	√	√	√	√
EE5381 System Assurance and Safety in	√	√	√	√

Core Subjects	Intended Learning Outcomes			
	(a) Professional competence	(b) Design capability	(c) Critical & creative thinking	(d) Lifelong learning capability
Railways				
EE539 Aerospace Power Electronics and Actuation Systems	√		√	√
EE545 Modern Generation and Grid Integration Technologies	√	√	√	√
EE546 Electric Energy Storage and New Energy Sources for Electric Vehicles	√		√	√
EE547 Electric Vehicle Charging Systems	√		√	√
EE548 Advanced Electric Vehicle Technology	√		√	√
EE549 Modern Sensor Technologies	√	√	√	√
EE550 Enterprise Risk and Asset Management	√		√	√
EE552 High Speed Rail	√	√	√	√
EE553 Railway Electronic Systems	√	√	√	√
EE560 Metros in Hong Kong and China	√	√	√	√
EE570 Design and Analysis of Smart Grids	√	√	√	√

8. **Entrance Requirements**

A Bachelor's degree with Honours in engineering, science or technology; or qualifications that satisfy the academic requirements for Corporate Membership of the Hong Kong Institution of Engineers (HKIE), or the equivalent.

Consideration will also be given to candidates without Honours degrees who have other relevant qualifications and/or appropriate working experience.

9. Programme Contents

Award Title	Core Subjects				
MSc in Electrical Engineering	EE501	EE502	EE505	EE509	EE510
	EE512	EE514	EE517	EE520	EE521
	EE522	EE524	EE526	EE527	EE528
	EE530	EE533	EE535	EE536	EE537
	EE5381	EE539	EE545	EE546	EE547
	EE548	EE549	EE550	EE552	EE553
	EE560	EE570			
MSc in Electrical Engineering (Electrical Power Systems)	EE501	EE502	EE505	EE509	EE524
	EE526	·EE545	EE570		
MSc in Electrical Engineering (Power Electronics and Drives)	EE501	EE510	EE512	EE520	EE521
	EE527	EE528	EE530	EE539	EE545
	EE546	EE547	EE548		
MSc in Electrical Engineering (Railway Systems)	EE509	EE510	EE533	EE535	EE536
	EE537	EE5381	EE550	EE552	
	EE553	EE560			

Master of Science in Electronic and Information Engineering

The programme also provides two specialisms of study option:

- MSc in Electronic and Information Engineering (Internet of Things)
- MSc in Electronic and Information Engineering (Multimedia Signal Processing and Communications)

1. Programme Aims

(a) To provide graduates of electronic and information engineering, electrical engineering, telecommunications engineering, computer science and other related disciplines an opportunity for further study at postgraduate level.

(b) To enable students to meet new challenges and tap new opportunities in relevant fields by studying a broad choice of core subjects in multimedia technologies, telecommunications and electronic engineering.

(c) To enable students to acquire the latest technical know-how by registering for specialized subjects in a chosen area that focuses on the cutting edge issues facing the engineering profession today.

2. Relationship of Programme Aims to University Mission

The University has the following mission:

(a) To pursue impactful research that benefits the world.

(b) To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.

(c) To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

The following table illustrates the relationship between programme aims and University mission:

Programme Aims	University Mission		
	(a)	(b)	(c)
(a)	x	x	x
(b)	x	x	x
(c)	x	x	x

3. **Institutional Learning Outcomes**

The institutional learning outcomes for taught postgraduate programmes are:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates of PolyU taught postgraduate programmes will possess in-depth knowledge and skills in their area of study and be able to apply their knowledge and contribute to professional leadership.

(b) **Strategic thinking:** Graduates of PolyU taught postgraduate programmes will be able to think holistically and analytically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions.

(c) **Lifelong learning capability:** Graduates of PolyU taught postgraduate programmes will have an enhanced capability for continual professional development through inquiry and reflection on professional practice.

4. **Intended Learning Outcomes of the Programme**

The programme has the following intended learning outcomes:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates will possess state-of-the-art knowledge and skills in the areas within electronic and information engineering and be able to apply their knowledge. They will have the readiness for assuming a leadership role in their field of practice.

(b) **Design capability:** Graduates will develop an ability to design an electronic system, component, or process to meet desired needs within realistic constraints such as technical, environmental, social, ethical, health and safety, manufacturability, and sustainability.

(c) **Critical and creative thinking:** Graduates will be able to think holistically and/or strategically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions to novel problems.

(d) **Lifelong learning capability:** Graduates will develop recognition of the need for, and an ability to engage in life-long learning.

5. **Relationship of Intended Learning Outcomes to Programme Aims**

The following table illustrates the relationship between intended learning outcomes and programme aims:

Intended Learning Outcomes	Programme Aims		
	(a)	(b)	(c)
(a)	x	x	x
(b)	x	x	x
(c)	x	x	x
(d)	x	x	x

6. Relationship of Intended Learning Outcomes of the Programme to Institutional Learning Outcomes

Intended Learning Outcomes	Institutional Learning Outcomes		
	(a)	(b)	(c)
(a)	x		
(b)	x		
(c)		x	
(d)			x

7. Curriculum Map

The curriculum map shown below indicates how each intended learning outcomes of the programme is addressed by the constituent subjects.

Core Subjects	Intended Learning Outcomes			
	(a) Professional competence	(b) Design capability	(c) Critical & creative thinking	(d) Lifelong learning capability
EIE509 Satellite Communications - Technology and Applications	√		√	√
EIE511 VLSI System Design	√	√	√	√
EIE515 Advanced Optical Communication Systems	√	√	√	√
EIE522 Pattern Recognition: Theory & Applications	√	√	√	√
EIE529 Digital Image Processing	√	√	√	√
EIE546 Video Technology	√	√	√	√
EIE553 Security in Data Communication	√		√	√
EIE557 Computational Intelligence and its Applications	√	√	√	√
EIE558 Speech Processing and Recognition	√	√	√	√
EIE563 Digital Audio Processing	√	√	√	√
EIE566 Wireless Communications	√	√	√	√
EIE567 Wireless Power Transfer Technologies	√	√	√	√
EIE568 IoT – Tools and Applications	√		√	√
EIE569 Sensor Networks	√	√	√	√
EIE570 Deep Learning with Photonics	√	√	√	√
EIE571 Photonic System Analysis	√	√	√	√
EIE572 Information Photonics	√		√	√
EIE573 Mobile Edge Computing	√	√	√	√
EIE575 Vehicular Communications and Inter-Networking Technologies	√	√	√	√
EIE577 Optoelectronic Devices	√	√	√	√
EIE579 Advanced Telecommunication	√	√	√	√

Core Subjects	Intended Learning Outcomes			
	(a) Professional competence	(b) Design capability	(c) Critical & creative thinking	(d) Lifelong learning capability
Systems				
EIE580 Radio Frequency and Microwave Integrated Circuits for Communication System Applications	√	√	√	√
EIE587 Channel Coding	√	√	√	√
EIE589 Wireless Data Network	√	√	√	√
COMP5434 Big Data Computing	√	√	√	√

8. Entrance Requirements

An Honours degree in engineering, science, or technology, or Chartered Engineer (CEng) status, or an equivalent qualification.

Consideration will also be given to candidates without Honours degrees who have other relevant qualifications and/or appropriate working experience.

9. Programme Contents

Award Title	Core Subjects
MSc in Electronic and Information Engineering	EIE509 EIE511 EIE515 EIE522 EIE529 EIE546 EIE553 EIE557 EIE558 EIE563 EIE566 EIE567 EIE568 EIE569 EIE570 EIE571 EIE572 EIE573 EIE575 EIE577 EIE579 EIE580 EIE587 EIE589
MSc in Electronic and Information Engineering (Internet of Things)	EIE515 EIE546 EIE553 EIE557 EIE566 EIE567 EIE568 EIE569 EIE570 EIE573 EIE575 EIE579 EIE589 COMP5434
MSc in Electronic and Information Engineering (Multimedia Signal Processing and Communications)	EIE522 EIE529 EIE546 EIE553 EIE557 EIE558 EIE563 EIE566 EIE567 EIE570 EIE573 EIE575 EIE589

Master of Science in Mechanical Engineering

The programme also provides four specialisms of study option:

- MSc in Mechanical Engineering (Aeronautical Engineering)
- MSc in Mechanical Engineering (Air/Noise Pollution Management)
- MSc in Mechanical Engineering (Aviation)
- MSc in Mechanical Engineering (Product Development and Analysis)

1. **Programme Aims**

   (a) To provide advanced education and training for students who intend to upgrade their knowledge and to seek a higher level career in the area of Mechanical Engineering;

   (b) To enable students to develop their competence to increase their competitiveness in the job market and become the backbone in industry;

   (c) To enable students to have good understanding and mastering of the most up-to-date advanced technologies in the area of Mechanical Engineering; and

   (d) To enable students to apply their learned knowledge and skills to solve problems encountered in practice.

2. **Relationship of Programme Aims to University Mission**

   The University has the following mission:

   (a) To pursue impactful research that benefits the world.

   (b) To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens.

   (d) To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

   The following table illustrates the relationship between programme aims and University mission:

Programme Aims	University Mission		
	(a)	(b)	(c)
(a)		√	√
(b)		√	√
(c)	√	√	√
(d)	√	√	√

3. **Institutional Learning Outcomes**

The institutional learning outcomes for taught postgraduate programmes are:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates of PolyU taught postgraduate programmes will possess in-depth knowledge and skills in their area of study and be able to apply their knowledge and contribute to professional leadership.

(b) **Strategic thinking:** Graduates of PolyU taught postgraduate programmes will be able to think holistically and analytically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions.

(c) **Lifelong learning capability**: Graduates of PolyU taught postgraduate programmes will have an enhanced capability for continual professional development through inquiry and reflection on professional practice.

4. **Intended Learning Outcomes of the Programme**

The programme has the following intended learning outcomes:

(a) **Professional competence of specialists/leaders of a discipline/profession and Design capability**: Graduates will possess state-of-the-art knowledge and skills in the area of Mechanical Engineering and be able to apply their knowledge and contribute to professional competence, including ability to design and develop a product, system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability. They will have the readiness for assuming a leadership role in their field of practice.

(b) **Critical and creative thinking**: Graduates will be able to think holistically, critically, strategically and creatively in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions to novel problems.

(c) **Lifelong learning capability**: Graduates will have recognition of the need for, and an ability to engage in life-long learning.

5. **Relationship of Intended Learning Outcomes to Programme Aims**

The following table illustrates the relationship between intended learning outcomes and programme aims:

Intended Learning Outcomes	Programme Aims			
	(a)	(b)	(c)	(d)
(a)	√	√	√	√
(b)	√	√	√	√
(c)		√		√

6. Relationship of Intended Learning Outcomes of the Programme to Institutional Learning Outcomes

Intended Learning Outcomes	Institutional Learning Outcomes		
	(a)	(b)	(c)
(a)	√		
(b)		√	
(c)			√

7. Curriculum Map

The curriculum map shown below indicates how each intended learning outcomes of the programme is addressed by the constituent subjects.

Compulsory/Core Subjects	Intended Learning Outcomes		
	(a) Professional competence	(b) Critical & creative thinking	(c) Lifelong learning capability
ME534 Engineering Acoustics	√	√	√
ME536 Vibration and Structure-borne Noise	√	√	√
ME540 Fuels and Engines	√	√	√
ME548 Computer Aided Product Analysis	√	√	√
ME552 Integrated Engineering Design	√	√	√
ME556 Advanced Combustion Systems	√	√	√
ME557 CFD & Thermo-fluid System Design	√	√	√
ME558 Advanced Materials and Structural Design	√	√	√
ME559 Advanced Environmental and Transportation Noise Control	√	√	√
ME564 Principles and Design of Air Pollution Control Devices	√	√	√
ME565 Prevention and Control of Vehicular Emission	√	√	√
ME566 Industrial and Environmental Measurement Technology	√	√	√
ME567 Advanced Control Technology	√	√	√
ME569 Thermal System Design and Management	√	√	√
ME570 Advanced Product Mechatronics	√	√	√
ME571 Corrosion Control	√	√	√

Compulsory/Core Subjects	Intended Learning Outcomes		
	(a) Professional competence	(b) Critical & creative thinking	(c) Lifelong learning capability
ME572 Design for Sustainable Development	√	√	√
ME573 Project on Product Design and Management	√	√	√
ME574 Product Noise Control	√	√	√
ME576 Turbulent Flows and Aerodynamics	√	√	√
ME577 Advanced Aircraft Structures	√	√	√
ME578 Aircraft Design	√	√	√
ME579 Aircraft Noise and Aeroacoustics	√	√	√
ME583 Advanced Avionics Systems	√	√	√
ME584 Airworthiness and Maintenance	√	√	√
ME585 Human Factors in Aircraft Maintenance	√	√	√
ME586 Operations Research in Aviation	√	√	√

8. Entrance Requirements

A Bachelor's degree with Honours in a relevant branch of engineering, or a related applied science discipline; or qualifications that satisfy the academic requirements for Corporate Membership of the mechanical discipline of the Hong Kong Institution of Engineers (HKIE), or the equivalent.

Consideration will also be given to candidates without Honours degrees who have other relevant qualifications and/or appropriate working experience.

9. Programme Contents

Award Title	Compulsory/Core Subjects
MSc in Mechanical Engineering	*Core subjects:* ME534 ME536 ME540 ME548 ME552 ME556 ME557 ME558 ME559 ME564 ME565 ME566 ME567 ME569 ME570 ME571 ME572 ME573 ME574 ME576 ME577 ME578 ME579 ME583 ME584 ME585 ME586
MSc in Mechanical Engineering (Aeronautical Engineering)	*Compulsory subjects:* ME576 ME577 ME578 *Core subjects:* ME548 ME579 ME540 ME567 ME558
MSc in Mechanical Engineering (Air/Noise Pollution Management)	*Core subjects:* ME534 ME536 ME540 ME556 ME559 ME564 ME565 ME574
MSc in Mechanical Engineering (Aviation)	*Compulsory subjects:* ME583 ME584 ME585 *Core subjects:* ME586 ME577 ME578 ME558 ME567
MSc in Mechanical Engineering (Product Development and Analysis)	*Core subjects:* ME548 ME552 ME557 ME558 ME564 ME570 ME571 ME572 ME573 ME574

Core Subjects Requirements of Individual Awards

Award (specialism)	Dissertation option	Non-dissertation option
■ MSc in Electrical Engineering ■ MSc in Electronic & Information Engineering ■ MSc in Mechanical Engineering	Complete SEVEN taught subjects and a 9-credit dissertation. For an award in a designated area, a minimum of FOUR taught subjects shall be core subjects specified for the relevant area and the dissertation topic shall be pertinent to the area.	Complete TEN taught subjects. For an award in a designated area, a minimum of SIX subjects shall be core subjects specified for the relevant area.
MSc in Electrical Engineering (Electrical Power Systems)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FOUR taught subjects shall come from the core subject list specified for the specialism of Electrical Power Systems.	Complete TEN taught subjects. A minimum of EIGHT subjects shall come from the core subject list, and of which at least SIX shall be core subjects specified for the specialism of Electrical Power Systems.
MSc in Electrical Engineering (Power Electronics and Drives)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FOUR taught subjects shall come from the core subject list specified for the specialism of Power Electronics and Drives.	Complete TEN taught subjects. A minimum of EIGHT subjects shall come from the core subject list, and of which at least SIX shall be core subjects specified for the specialism of Power Electronics and Drives
MSc in Electrical Engineering (Railway Systems)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FOUR taught subjects shall come from the core subject list specified for the specialism of Railway Systems.	Complete TEN taught subjects. A minimum of EIGHT subjects shall come from the core subject list, and of which at least SIX shall be core subjects specified for the specialism of Railway Systems.
MSc in Electronic & Information Engineering (Internet of Things)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FIVE taught subjects shall come from the core subject list specified for the specialism of Internet of Things.	Complete TEN taught subjects. A minimum of SEVEN subjects shall come from the core subject list specified for the specialism of Internet of Things.

Award (specialism)	Dissertation option	Non-dissertation option
MSc in Electronic & Information Engineering (Multimedia Signal Processing and Communications)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FIVE taught subjects shall come from the core subject list specified for the specialism of Multimedia Signal Processing and Communications.	Complete TEN taught subjects. A minimum of SEVEN subjects shall come from the core subject list specified for the specialism of Multimedia Signal Processing and Communications.
MSc in Mechanical Engineering (Aeronautical Engineering)	Complete SEVEN taught subjects, including THREE compulsory and at least ONE core subject specified for the specialism of Aeronautical Engineering, and a 9-credit dissertation.	Complete TEN taught subjects, including THREE compulsory and at least THREE core subjects specified for the specialism of Aeronautical Engineering.
MSc in Mechanical Engineering (Aviation)	Complete SEVEN taught subjects, including THREE compulsory and at least ONE core subject specified for the specialism of Aviation, and a 9-credit dissertation.	Complete TEN taught subjects, including THREE compulsory and at least THREE core subjects specified for the specialism of Aviation.
MSc in Mechanical Engineering (Air/Noise Pollution Management)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FOUR taught subjects shall come from the core subject list specified for the specialism of Air/Noise Pollution Management.	Complete TEN taught subjects. A minimum of SIX subjects shall come from the core subject list specified for the specialism of Air/Noise Pollution Management.
MSc in Mechanical Engineering (Product Development and Analysis)	Complete SEVEN taught subjects and a 9-credit dissertation. A minimum of FOUR taught subjects shall come from the core subject list specified for the specialism of Product Development and Analysis.	Complete TEN taught subjects. A minimum of SIX subjects shall come from the core subject list specified for the specialism of Product Development and Analysis.

PgD Exit Awards	
▪ PgD in Electrical Engineering ▪ PgD in Electronic & Information Engineering ▪ PgD in Mechanical Engineering	Complete SIX taught subjects. For an award in a designated area, a minimum of FOUR taught subjects shall be core subjects specified for the relevant area.
PgD in Electrical Engineering (Electrical Power Systems)	Complete SIX taught subjects. A minimum of FOUR subjects shall come from the core subject list specified for the specialism of Electrical Power Systems.
PgD in Electrical Engineering (Power Electronics and Drives)	Complete SIX taught subjects. A minimum of FOUR subjects shall come from the core subject list specified for the specialism of Power Electronics and Drives.
PgD in Electrical Engineering (Railway Systems)	Complete SIX taught subjects. A minimum of FOUR subjects shall come from the core subject list specified for the specialism of Railway Systems.
PgD in Electronic & Information Engineering (Internet of Things)	Complete SIX taught subjects. A minimum of FIVE subjects shall come from the core subject list specified for the specialism of Internet of Things.
PgD in Electronic & Information Engineering (Multimedia Signal Processing and Communications)	Complete SIX taught subjects. A minimum of FIVE subjects shall come from the core subject list specified for the specialism of Multimedia Signal Processing and Communications.
PgD in Mechanical Engineering (Air/Noise Pollution Management)	Complete SIX taught subjects. A minimum of FOUR subjects shall come from the core subject list specified for the specialism of Air/Noise Pollution Management.
PgD in Mechanical Engineering (Aeronautical Engineering)	Complete SIX taught subjects, including THREE compulsory and at least ONE core subject specified for the specialism of Aeronautical Engineering.
PgD in Mechanical Engineering (Aviation)	Complete SIX taught subjects, including THREE compulsory and at least ONE core subject specified for the specialism of Aviation.
PgD in Mechanical Engineering (Product Development and Analysis)	Complete SIX taught subjects. A minimum of FOUR subjects shall come from the core subject list specified for the specialism of Product Development and Analysis.