Curriculum Information Record for a Major/Degree

Department of Electrical Engineering
Effective from Semester A, 2022/23
For Students Admitted/Changed to the Major with Catalogue Term
Semester A 2023/2024 and thereafter

The information provided on this form is the official record of the major/degree. It will be used for City University's database, various City University publications (including websites) and documentation for students and others as required.

In specifying the curriculum for a major/degree, "catalogue term" is used to determine the set of curriculum requirements that a student is following. By mapping the student record and the version of curriculum rules applicable, the graduation requirements of individual students will be evaluated accordingly. The catalogue terms of curriculum requirements that students will follow are summarized below (BUS/04/A5R):

Requirements	Catalogue Term
a) Common Requirements • Gateway Education • University Requirements • College/School requirement	The same as student's admission term
b) Major • For normative 4-year degree students who will join the majors allocation exercise	Effective term of the declared major
• For advanced standing students and 4-year degree students who already have a major at the time of admission	The same as student's admission term
• For students who have changed major	Effective term of the changed major
c) Stream	Follow the effective term of the associated major

Prepared / Last Updated by

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City University of Hong Kong

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Effective from Semester A, 2022/23
For Students Admitted/Changed to the Major with Catalogue Term
Semester A 2023/2024 and thereafter

Part I Major/Degree Overview

| **Major** | (in English) | : | Information Engineering |
| | (in Chinese) | : | 資訊工程學 |

| **Degree** | (in English) | : | Bachelor of Engineering |
| | (in Chinese) | : | 工學士 |

| **Award Title[#]** | (in English) | : | Bachelor of Engineering in Information Engineering |
| | (in Chinese) | : | 工學士(資訊工程學) |

 # Please make reference to the "Guidelines on Award Titles" approved by the Senate when proposing new award titles or changes to existing award titles (Senate/86/A5R).

1. Normal and Maximum Period of Study

	Normative 4-year Degree	**Advanced Standing I** (Note 1)	**Advanced Standing II (Senior-year Entry)** (Note 2)
Normal period of study	4 years	3 years	2.5 years
Maximum period of study	8 years	6 years	5 years

Note 1: For students with recognised Advanced Level Examination or equivalent qualifications.
Note 2: For Associate Degree/Higher Diploma graduates admitted to the senior year.

2. Minimum Number of Credit Units Required for the Award and Maximum Number of Credit Units Permitted

Degree Requirements	Normative 4-year Degree	Advanced Standing I	Advanced Standing II (Senior-year Entry)
Gateway Education requirement *	30 credit units	21 credit units	12 credit units
College/School requirement *	6 credit units	Not required	Not required
Major requirement	84 credit units (Core: 69 Elective: 15)	75 credit units (Core: 60 Elective: 15)	60-72 credit units (Core: 45-57 Elective: 15)
Free electives / Minor (if applicable)	Optional	Optional	N.A.
Minimum number of credit units required for the award	**120 credit units**	**96 credit units**	**72 credit units**
Maximum number of credit units permitted	**144 credit units**	**114 credit units**	**84 credit units**

* For details, please refer to the Curriculum Information Record for Common Requirements.

3. Aims of Major

The aims of this major are to provide students with an education in information engineering, and to prepare them to have the necessary knowledge, skills and understanding to pursue a career as professional engineers. The contents covered aim to have breadth to allow graduates to work across boundaries as well as depth to equip and prepare them to meet the demands of employers as well as the demands for pursuing postgraduate studies. Through this experience, our graduates will also have the ability and vision that will enable them to become independent life-long learners in this rapidly changing information age.

4. Intended Learning Outcomes of Major (MILOs)

(Please state what the student is expected to be able to do on completion of the major according to a given standard of performance.)

Upon successful completion of this major, students should be able to:

No.	MILOs	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
		A1	*A2*	*A3*
1.	apply knowledge of mathematics science and engineering.		√	
2.	design and conduct experiments as well as to analyze and interpret data.			√
3.	design a system, component, or process that conforms to a given specification within realistic constraints.			√
4.	function on multi-disciplinary teams.	√		

5.	identify, evaluate, formulate and solve engineering problems.		√	√
6.	be aware of professional and ethical responsibilities.	√		
7.	communicate effectively.		√	√
8.	have knowledge in contemporary issues and an awareness of the impact of engineering solutions in a broad, global and societal context.	√		
9.	recognise the need for life-long learning.	√		
10.	use necessary engineering tools.		√	

A1: *Attitude*
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: *Ability*
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: *Accomplishments*
Demonstrate accomplishments of discovery/innovation/creativity through producing/constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Part II Major Requirement

(The catalogue term of the major requirement that students will follow will be the effective term of the declared/allocated major.

For normative 4-year degree students who will join the majors allocation exercise, the catalogue term of major requirement will be one year after admission.

For advanced standing students and 4-year degree students who already have a major at the time of admission, the catalogue term of major requirement will be the same as their admission term.)

1. **Core Courses**
    Normative 4-year Degree: 69 credit units
    Advanced Standing I: 60 credit units
    Advanced Standing II: 45-57 credit units

Course Code	Course Title	Level	Credit Units	Remarks
EE1000	Programme Induction	B1	0	
EE1001	Foundations of Digital Techniques	B1	3	Advanced Standing I/II: Not required
EE1002	Principles of Electrical Engineering	B1	3	Advanced Standing I/II: Not required
EE1004	Foundations of Information Systems and Data Analysis	B1	3	Advanced Standing I/II: Not required
GE1354	Introduction to Electronic Design	B1	3	Advanced Standing I/II: Not required
CS2311	Computer Programming	B2	3	Advanced Standing II: Not required
EE2000	Logic Circuit Design	B2	3	See remark #
EE2004	Microcomputer Systems	B2	3	See remark #

EE2302	Foundations of Information Engineering	B2	3	
EE2005	Electronic Devices and Circuits	B2	3	See remark #
EE3206	Java Programming and Applications	B3	3	
EE2331	Data Structures and Algorithms	B2	3	See remark #
MA2001	Multi-variable Calculus & Linear Algebra	B2	3	
CS3103	Operating Systems	B3	3	
CS3402	Database Systems	B3	3	
EE3008	Principles of Communications	B3	3	
EE3009	Data Communications and Networking	B3	3	
EE2066	Engineers in Society	B3	3	**Counted as "College-specified GE Course" for 4-year degree students.** **Counted as "Major Requirement" for Advanced Standing I/II students.** Students successfully completed EE4082/EE4083/EE4084 are not required to take this course.
EE3210	Signals and Systems	B3	3	
EE3301	Optimization Methods for Engineering	B3	3	
EE3315	Internet Technology	B3	3	
EE3070	Design Project	B3	3	Students successfully completed EE4083 are not required to take this course.
EE3331	Probability Models in Information Engineering	B3	3	
EE4090	Engineering Training	B4	0	Students successfully completed EE4084 are not required to take this course.
EE4080	Project	B4	6	Students successfully completed EE4084 are not required to take this course. A course to fulfil the internship/consultancy project/research project requirement for normative 4-year degree students.

Upon admission, Advanced Standing II students will be reviewed on their qualifications and backgrounds to see if these courses are required for their major requirements.

2. **Electives (15 credit units)**

Students are required to take at least FIVE electives of which no more than ONE Level-3 elective should be taken.

Communications and Networking

Course Code	Course Title	Level	Credit Units	Remarks
EE4014	Business Data Communication Networks	B4	3	
EE4017	Internet Finance	B4	3	
EE4036	Wireless Communications	B4	3	
EE4212	Cryptography and Information Theory	B4	3	
EE4316	Mobile Data Networks	B4	3	

Computer Systems and Information Processing

Course Code	Course Title	Level	Credit Units	Remarks
CS4482	Advanced Database Systems	B4	3	
EE3209	Data Management Techniques	B3	3	
EE4015	Digital Signal Processing	B4	3	
EE4016	Engineering Applications of Artificial Intelligence	B4	3	
EE4146	Data Engineering and Learning Systems	B4	3	
EE4215	Cybersecurity Technology	B4	3	
EE4211	Computer Vision	B4	3	
EE4221	Cloud Computing Systems	B4	3	
EE4222	Digital Forensics	B4	3	

Software Design and Development

Course Code	Course Title	Level	Credit Units	Remarks
CS3391	Advanced Programming	B3	3	
CS4367	Computer Games Design	B4	3	
EE4208	Computer Graphics for Engineers	B4	3	
EE4213	Human-Computer Interaction	B4	3	
EE4216	Modern Web Applications	B4	3	
EE4304	iOS Mobile App Development and Networking	B4	3	

3. **Optional Internship Courses**

Course Code	Course Title	Level	Credit Units	Remarks
EE4082	Professional Internship Program	B4	3	This internship course of 3CU can be used to waive the Major

					requirement of **EE2066 Engineers in Society**. A course to fulfil the internship/consultancy project/research project requirement for normative 4-year degree students.
EE4083	Professional Internship Program	B4	6		This internship course of 6CU can be used to waive the Major requirements of **EE2066 Engineers in Society and EE3070 Design Project or its equivalent.** A course to fulfil the internship/consultancy project/research project requirement for normative 4-year degree students.
EE4084	Professional Internship Program	B4	9		This internship course of 9CU can be used to waive the Major requirements of **EE2066 Engineers in Society, EE4080 Project or its equivalent, and EE4090 Engineering Training or its equivalent.** A course to fulfil the internship/consultancy project/research project requirement for normative 4-year degree students.

4. **Graduate Level Courses (electives for Undergraduate plus Taught Postgraduate Degree Programme)**
   a. Serving as electives for students enrolling in Undergraduate plus Taught Postgraduate Degree Programme.
   b. Students are expected to complete their **BEng degree requirements in their first 3.5 years of studies, out of which a maximum of 9CUs of MSc courses are taken as electives**, which will be transferred to fulfil the MSc degree requirements.

Course Code	Course Title	Level	Credit Units	Remarks
EE5410	Signal Processing	P5		
EE5412	Telecommunication Networks	P5		
EE5415	Mobile Applications Design and Development	P5		
EE5434	Machine Learning for Signal Processing Applications	P5		
EE5437	Internet of Things Technologies for Future City Applications	P5		
EE5805	Java Network Programming	P5		
EE5806	Topics in Image Processing	P5		
EE5808	Topics in Computer Graphics	P5		
EE5815	Topics in Security Technology	P5		
EE6435	Multi-Dimensional Data Modeling and its Application	P6		
EE6453	Mobile Communication and Networks	P6		
EE6603	Wireless Communication Technologies	P6		
EE6605	Complex Networks: Modeling, Dynamics and Control	P6		
EE6610	Queueing Theory with Telecommunications Applications	P6		
EE6617	Detection and Estimation – Theory and Applications in Communications	P6		

Part III Admission Requirements for Entry to the Major, if any

(Admission requirements here refers to specific requirements for students already admitted to the College/School/Department with an undeclared major. Academic units can state the prerequisites required for admission to the major.)

Nil

Part IV Accreditation by Professional / Statutory Bodies

The major is accredited by the Hong Kong Institution of Engineers (HKIE).

Part V Additional Information

Nil

Part VI

1. Curriculum Map (Undergraduate courses)

(The curriculum map shows the mapping between courses and the MILOs. It should cover all courses designed specifically for the major.)

	MILOs									
	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**
City University Ideal Graduate Outcomes	G02	G02	G02	G03	G02	G01, 5	G03	G01, 4,5	G04	G02
Discovery-enriched Curriculum (DEC) elements*	A2	A3	A3	A1	A2,3	A1	A2,3	A1	A1	A2
Graduate Attributes (Professional bodies) (Optional) (Professional Body: HKIE)	a	b, l	c	d	e	f	g, l	j, i	j	k, l

Course			MILOs										DEC		
Code	**Title**	**Credit**	**M1 (a)**	**M2 (b, l)**	**M3 (c)**	**M4 (d)**	**M5 (e)**	**M6 (f)**	**M7 (g, l)**	**M8 (h, i)**	**M9 (j)**	**M10 (k, l)**	**A1**	**A2**	**A3**
Core Course															
EE1000	Programme Induction	0							P	P	P		✓	✓	✓
EE1001	Foundations of Digital Techniques	3	T/P	T/P	T/P		T/P		T/P			P	✓	✓	
EE1002	Principles of Electrical Engineering	3	T/P				T/P		T/P	P	P		✓	✓	
EE1004	Foundations of Information Systems and Data Analysis	3	T/P		T/P		T/P						✓	✓	
GE1354	Introduction to Electronic Design	3	T/P	T/P	T/P	P	T/P		T/P			P	✓	✓	✓
CS2311	Computer Programming	3	T/P		T/P		T/P					T/P	✓	✓	
EE2000	Logic Circuit Design	3	T/P	P	T/P/M		P		P/M			P	✓	✓	
EE2004	Microcomputer Systems	3	T/P	T/P/M	T/P/M	P/M	T/P		P/M			T/P/M	✓	✓	✓
EE2302	Foundations of Information Engineering	3	T/P/M				T					T/P	✓	✓	
EE2005	Electronic Devices and Circuits	3	T/P	T/P/M			T/P		T/P/M			P	✓	✓	
EE3206	Java Programming and Applications	3	T/P		T/P		T/P					P	✓	✓	✓
MA2001	Multi-variable Calculus and Linear Algebra	3	T/P										✓	✓	✓
EE3331	Probability Models in Information Engineering	3	T/P		T/P		T/P						✓	✓	
CS3103	Operating Systems	3	T/P	T	T/P		T					T/P	✓	✓	
CS3402	Database Systems	3	T/P		T/P		T/P					P	✓	✓	
EE2331	Data Structures and Algorithms	3	T/P		T/P		T/P/M					P	✓	✓	✓
EE3008	Principles of Communications	3	T/P	T/P			T/P			T		T	✓	✓	
EE3009	Data Communications and Networking	3	T/P				T/P					T/P/M	✓	✓	
EE3210	Signals and Systems	3	T/P/M	T/P	T/P		T/P/M	T		T/M	T/M	P	✓	✓	
EE3301	Optimization Methods for Engineering	3	T/P/M				T/P					T/P/M	✓	✓	
EE3315	Internet Technology	3	T/P	T/P/M		P/M	T/P/M		P			P	✓	✓	

Code	Course	Cr													
EE3070	Design Project	3	T/P	P/M	T/P/M	P/M	P/M	T/P/M	P	T/P/M	P/M	T/P/M	✓	✓	✓
EE4090	Engineering Training	0	P	T/P/M	T/P/M	T/P/M	P	P/M	P	P	P/M	T/P/M	✓	✓	
EE2066	Engineers in Society	3						T/P/M		T/P/M			✓	✓	
EE4080	Project	6	P/M	P	P		P/M	P/M	P/M	P/M	P/M	P	✓	✓	✓

Electives (choose 15 credits)
Students are required to take at least FIVE electives of which no more than ONE Level-3 elective should be taken

Communications and Networking

Code	Course	Cr													
EE4014	Business Data Communication Networks	3	T/P		T/P		T/P				P		✓	✓	
EE4017	Internet Finance	3	T/P		T/P		T/P				T/P		✓	✓	
EE4036	Wireless Communications	3	T/P		T/P		T/P						✓	✓	
EE4212	Cryptography and Information Theory	3	T/P				T/P						✓	✓	
EE4316	Mobile Data Networks	3	T/P	T/P	T/P	T/P	T/P						✓	✓	

Computer Systems and Information Processing

Code	Course	Cr													
CS4482	Advanced Database Systems	3	T/P		T/P		T/P				P		✓	✓	
EE3209	Data Management Techniques	3	T/P		T/P		T/P				T/P		✓	✓	
EE4015	Digital Signal Processing	3	T/P		T/P		T/P						✓	✓	
EE4016	Engineering Applications of Artificial Intelligence	3	T/P		T/P		T/P						✓	✓	
EE4146	Data Engineering and Learning Systems	3	T/P		T/P		T/P						✓	✓	
EE4215	Cybersecurity Technology	3	T/P	T/P	T/P	T/P	T/P		P		P		✓	✓	✓
EE4211	Computer Vision	3	T/P	T/P			T/P				T/P		✓	✓	
EE4221	Cloud Computing Systems	3	T/P		T/P/M		T/P				T/P		✓	✓	
EE4222	Digital Forensics	3	T/P	T/P	T/P		T/P				T/P		✓	✓	

Software Design and Development

Code	Course	Cr													
CS3391	Advanced Programming	3	T/P		T/P		T/P				P		✓	✓	
CS4367	Computer Games Design	3	T/P		T/P		T/P				T/P		✓	✓	
EE4208	Computer Graphics for Engineers	3	T/P		T/P		T/P				P		✓	✓	
EE4213	Human-Computer Interaction	3	T/P		T/P		T/P				P		✓	✓	✓
EE4216	Modern Web Applications	3	T/P		T/P		T/P			P	P		✓	✓	
EE4304	iOS Mobile App Development and Networking	3	T/P		T/P	T/P	T/P				P		✓	✓	

Optional Internship Courses

Code	Course	Cr													
EE4082	Professional Internship Program	3				P	P	T/P/M	P	T/P/M			✓	✓	✓
EE4083	Professional Internship Program	6				P	P	T/P/M	P	T/P/M			✓	✓	✓
EE4084	Professional Internship Program	9				P	P	T/P/M	P	T/P/M			✓	✓	✓

2. Curriculum Map (Postgraduate courses)

(The curriculum map shows the mapping between courses and the MILOs. It should cover all courses designed specifically for the major.)

Course Code & Title	M1 (a)	M2 (b, l)	M3 (c)	M4 (d)	M5 (e)	M6 (f)	M7 (g, l)	M8 (h, i)	M9 (j)	M10 (k, l)	A1	A2	A3
EE5410 Signal Processing	T/P		T/P		T/P					P	✓	✓	
EE5412 Telecommunication Networks	T/P									T/P	✓		
EE5415 Mobile Applications Design and Development	T/P		T/P	T/P	T/P					P	✓	✓	
EE5434 Machine Learning for Signal Processing Applications	T/P		T/P		T/P		T/P				✓	✓	✓
EE5437 Internet of Things Technologies for Future City Applications	T/P	T/P	T/P		T/P					T/P	✓	✓	✓
EE5805 Java Network Programming	T/P		T/P		T/P					T/P	✓	✓	✓
EE5806 Topics in Image Processing	T/P	T/P			T/P					T/P	✓	✓	
EE5808 Topics in Computer Graphics	T/P		T/P		T/P					T/P	✓	✓	✓
EE5815 Topics in Security Technology	T/P	T/P	T/P	T/P	T/P		P			P	✓	✓	
EE6435 Multi-Dimensional Data Modeling and its Application	T/P	T/P			T/P					T/P	✓	✓	✓
EE6453 Mobile Communication and Networks	T/P				T/P						✓	✓	
EE6603 Wireless Communication Technologies	T/P		T/P		T/P						✓	✓	
EE6605 Complex Networks: Modeling, Dynamics and Control	T/P	T/P	T/P		T/P	T/P		T/P			✓	✓	✓
EE6610 Queueing Theory with Telecommunications Applications	T/P	T/P					T/P				✓	✓	
EE6617 Detection and Estimation – Theory and Applications in Communications	T/P		T/P		T/P					P	✓	✓	

T-taught, P-practiced, M-measured

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishments of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

HKIE Programme outcomes that describe what students are expected to know and to do by the time of graduation. These must include (Note 1):

(a) an ability to apply knowledge of mathematics, science, and engineering appropriate to the degree discipline
(b) an ability to design and conduct experiments, as well as to analyse and interpret data
(c) an ability to design a system, component or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability
(d) an ability to function on multi-disciplinary teams
(e) an ability to identify, formulate and solve engineering problems
(f) an ability to understand professional and ethical responsibility
(g) an ability to communicate effectively

(h)   an ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public

(i)   an ability to stay abreast of contemporary issues

(j)   an ability to recognise the need for, and to engage in life-long learning

(k)   an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice appropriate to the degree discipline

(l)   an ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations

Note 1:   The graduate attributes are reproduced from the HKIE accreditation criteria for engineering degrees. The interpretation of these graduate attributes should be consistent with the requirements of the Washington Accord and a copy of these attributes is enclosed at the end of this submission format.

City University Ideal Graduate Outcomes
G01:   Globally minded professional
G02:   Innovative and critical thinker
G03:   Effective communicator
G04:   Lifelong learner
G05:   Civically-oriented individual