



## Curriculum Information Record for a Major/Degree

### Department of Electrical Engineering

### Effective from Semester A , 2024/2025

### 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):

<u>Requirements</u>	<u>Catalogue Term</u>
a) Common Requirements <ul style="list-style-type: none"> <li>Gateway Education</li> <li>University Requirements</li> <li>College/School requirement</li> </ul>	The same as student’s admission term
<hr/>	
b) Major <ul style="list-style-type: none"> <li>For normative 4-year degree students who will join the majors allocation exercise</li> <li>For advanced standing students and 4-year degree students who already have a major at the time of admission</li> <li>For students who have changed major</li> </ul>	Effective term of the declared major  The same as student’s admission term  Effective term of the changed major
<hr/>	
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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Department of Electrical Engineering

Effective from Semester A, 2024/2025

For Students Admitted/Changed to the Major with Catalogue Term

Semester A 2023/2024 and thereafter

### Part I Major/Degree Overview

**Major** (in English) : Computer and Data Engineering  
(in Chinese) : 電子計算機及數據工程學

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

**Award Title<sup>#</sup>** (in English) : Bachelor of Engineering in Computer and Data Engineering  
(in Chinese) : 工學士(電子計算機及數據工程學)

*# 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**

<b>Degree Requirements</b>	<b>Normative 4-year Degree</b>	<b>Advanced Standing I</b>	<b>Advanced Standing II (Senior-year Entry)</b>
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.
<b>Minimum number of credit units required for the award</b>	<b>120 credit units</b>	<b>96 credit units</b>	<b>72 credit units</b>
<b>Maximum number of credit units permitted</b>	<b>144 credit units</b>	<b>114 credit units</b>	<b>84 credit units</b>

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

**3. Aims of Major**

We aim to provide students with a strong foundation and broad skills in the computer and data technologies. Students will be equipped with the theoretical and practical aspects of computer systems. The curriculum encompasses hardware and software design, multimedia technologies, data analytics and security, cloud computing systems, and artificial intelligence. Upon completion of the major, students will be sufficiently prepared for employment, and to pursue postgraduate studies and engage in life-long learning.

#### 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 to meet desired needs within realistic constraints.			√
4.	function on multi-disciplinary teams.	√		
5.	identify, 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/IT 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: 45-57credit 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
MA2001	Multi-variable Calculus & Linear Algebra	B2	3	
EE2000	Logic Circuit Design	B2	3	See remark #
EE2004	Microcomputer Systems	B2	3	See remark #
EE3211	Modelling Techniques	B3	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 #
CS3103	Operating Systems	B3	3	
CS3402	Database Systems	B3	3	
EE3001	Foundations of Data Engineering	B3	3	
EE3009	Data Communications and Networking	B3	3	

Course Code	Course Title	Level	Credit Units	Remarks
EE2066	Engineers in Society	B2	3	<p><b>Counted as “College-specified GE Course” for 4-year degree students.</b></p> <p><b>Counted as “Major Requirement” for Advanced Standing I/II students.</b></p> <p>Students successfully completed <b>EE4085</b> are not required to take this course.</p>
EE3210	Signals and Systems	B3	3	
EE3220	System-on-Chip Design	B3	3	
EE3070	Design Project	B3	3	
EE3315	Internet Technology	B3	3	
EE4146	Data Engineering and Machine Learning	B4	3	
EE4080	Project	B4	6	<p>Students successfully completed <b>EE4087</b> are not required to take this course.</p> <p>A course to fulfill the internship/consultancy project/research project requirement for normative 4-year degree students.</p>
EE4090	Engineering Training	B4	0	Students successfully completed <b>EE4085</b> are not required to take this course.

# 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 TWO Level-3 electives should be taken.

Course Code	Course Title	Level	Credit Units	Remarks
CS3391 or CS4335	Advanced Programming or Design and Analysis of Algorithms	B3 B4	3 3	Students can only take either one to fulfill the curriculum requirement.
CS4386	AI Game Programming	B4	3	
EE3209	Data Management Techniques	B3	3	
EE3301	Optimization Methods for Engineering	B3	3	
EE3331	Probability Models in Information Engineering	B3	3	
EE4014	Business Data Communication Networks	B4	3	
EE4015	Digital Signal Processing	B4	3	
EE4016	Applications of AI with Deep Learning	B4	3	
EE4017	Internet Finance	B4	3	
EE4208 or EE5808	Computer Graphics for Engineers or Topics in Computer Graphics	B4 P5	3 3	Students can only take either one to fulfill the curriculum requirement.
EE4211 or CS4186	Computer Vision or Computer Vision and Image Processing	B4 B4	3 3	Students can only take either one to fulfill the curriculum requirement.
EE4212	Cryptography and Information Theory	B4	3	
EE4213	Human-Computer Interaction	B4	3	
EE4215	Cybersecurity Technology	B4	3	
EE4216	Modern Web Applications	B4	3	
EE4218	Computer Architecture	B4	3	
EE4221	Cloud Computing Systems	B4	3	
EE4222	Digital Forensics	B4	3	
EE4304	iOS Mobile App Development and Networking	B4	3	
EE4316	Mobile Data Networks	B4	3	
SDSC3001	Big Data: The Arts and Science of Scaling	B3	3	

Note: Students successfully completed EE4086 can take one less elective course. See below.

## 3. Optional Internship Courses

Course Code	Course Title	Level	Credit Units	Remarks
EE4085	Internship: Engineering Practice	B4	3	This internship course of 3CU can be used to fulfill <b>EE2066 Engineers in Society and EE4090 Engineering Training</b> .  A course to fulfill the internship/consultancy project/research project requirement for normative 4-year degree students.
EE4086	Internship: Advanced Topics in Electrical Engineering	B4	3	This internship course of 3CU can be used to fulfill <b>one elective</b> .  A course to fulfill the internship/consultancy project/research project requirement for normative 4-year degree students.
EE4087	Internship: Industrial Project	B4	6	This internship course of 6CU can be used to fulfill <b>EE4080 Project</b> .  A course to fulfill the internship/consultancy project/research project requirement for normative 4-year degree students.

Note: Students interested in internship can opt to take EE4085 only, OR EE4086/4087 in addition to successful completion of EE4085.

#### 4. Graduate Level Courses (electives for Undergraduate plus Master's Degree Programme)

- Serving as electives for students enrolling in Undergraduate plus Master's Degree Programme.
- Students are expected to complete their **BEng degree requirements in their first 3.5 years of studies, out of which a maximum of 9 CUs of MSc courses are taken as electives**, which will be transferred to fulfill the MSc degree requirements.

Course Code	Course Title	Level	Credit Units	Remarks
EE5410	Signal Processing	P5	3	
EE5412	Telecommunication Networks	P5	3	
EE5415	Mobile Applications Design and Development	P5	3	
EE5434	Machine Learning for Signal Processing Applications	P5	3	
EE5437	Internet of Things Technologies for Future City Applications	P5	3	
EE5438	Applied Deep Learning	P5	3	Exclusive course: EE4016
EE5805	Java Network Programming	P5	3	
EE5806	Topics in Image Processing	P5	3	
EE5808	Topics in Computer Graphics	P5	3	
EE5815	Topics in Security Technology	P5	3	



EE6435	Multi-Dimensional Data Modeling and its Application	P6	3	
EE6453	Mobile Communication and Networks	P6	3	
EE6603	Wireless Communication Technologies	P6	3	
EE6605	Complex Networks: Modeling, Dynamics and Control	P6	3	

### **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 (HKIE Required Outcomes)										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
<b>Core Courses</b>															
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	✓	✓	
MA2001	Multi-variable Calculus & Linear Algebra	3	T/P										✓	✓	✓
EE2004	Microcomputer Systems	3	T/P	T/P/M	T/P/M	P/M	T/P		P/M			T/P/M	✓	✓	✓
EE3211	Modeling Techniques	3	T/P/M	T/P			T/P	T/P				T/P/M	✓	✓	✓
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	✓	✓	✓
EE2331	Data Structures and Algorithms	3	T/P		T/P		T/P/M					P	✓	✓	✓
CS3103	Operating Systems	3	T/P	T	T/P		T					T/P	✓	✓	
CS3402	Database Systems	3	T/P		T/P		T/P					P	✓	✓	
EE3001	Foundations of Data Engineering	3	T/P/M	T/P								T/P	✓	✓	
EE3009	Data Communications and Networking	3	T/P				T/P					T/P/M	✓	✓	
EE2066	Engineers in Society	3						T/P/M		T/P/M			✓	✓	
EE3210	Signals and Systems	3	T/P/M	T/P	T/P		T/P/M	T		T/M	T/M	P	✓	✓	
EE3220	System-on-Chip Design	3	T/P	P	T/P	P	T/P		P			P	✓	✓	
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	✓	✓	✓
EE3315	Internet Technology	3	T/P/M	T/P		P	T/P		P			P	✓	✓	

EE4146	Data Engineering and Machine Learning	3	T/P/M		T/P/M		T/P						✓	✓	
EE4080	Project	6	P/M	P	P		P/M	P/M	P/M	P/M	P/M	P	✓	✓	✓
EE4090	Engineering Training	0	P	T/P/M	T/P/M	T/P/M	P	P/M	P	P	P/M	T/P/M	✓	✓	✓
<b>Electives (choose 15 credits)</b>															
<i>Students are required to take at least FIVE electives of which no more than TWO Level-3 electives should be taken.</i>															
CS3391 or CS4335	Advanced Programming or Design and Analysis of Algorithms	3 3	T/P T/P		T/P T/P		T/P T/P					P P	✓ ✓	✓ ✓	
CS4386	AI Game Programming	3	T/P		T/P		T/P					T/P	✓	✓	✓
EE3209	Data Management Techniques	3	T/P		T/P		T/P					T/P	✓	✓	
EE3301	Optimization Methods for Engineering	3	T/P/M				T/P					T/P/M	✓	✓	
EE3331	Probability Models in Information Engineering	3	T/P		T/P		T/P						✓	✓	
EE4014	Business Data Communication Networks	3	T/P		T/P		T/P					P	✓	✓	
EE4015	Digital Signal Processing	3	T/P		T/P		T/P						✓	✓	
EE4016	Applications of AI with Deep Learning	3	T/P		T/P		T/P						✓	✓	
EE4017	Internet Finance	3	T/P		T/P		T/P					T/P	✓	✓	
EE4208 or EE5808	Computer Graphics for Engineers or Topics in Computer Graphics	3 3	T/P T/P		T/P T/P		T/P T/P					T/P T/P	✓ ✓	✓ ✓	✓ ✓
EE4211 or CS4186	Computer Vision or Computer Vision and Image Processing	3 3	T/P T/P	T/P T/P			T/P T/P					T/P T/P	✓ ✓	✓ ✓	
EE4212	Cryptography and Information Theory	3	T/P				T/P						✓	✓	
EE4213	Human-Computer Interaction	3	T/P		T/P		T/P					P	✓	✓	✓
EE4215	Cybersecurity Technology	3	T/P	T/P		T/P	T/P					P	✓	✓	
EE4216	Modern Web Applications	3	T/P		T/P		T/P				P	P	✓	✓	
EE4218	Computer Architecture	3	T/P		T/P		T/P			T			✓	✓	

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/M				T/P	✓	✓	
EE4304	iOS Mobile App Development and Networking	3	T/P		T/P	T/P	T/P					P	✓	✓	
EE4316	Mobile Data Networks	3	T/P	T/P	T/P	T/P	T/P						✓	✓	
SDSC3001	Big Data: The Arts and Science of Scaling	3	T/P	T	T/P								✓	✓	✓
<b>Optional Internship Courses</b>															
EE4085	Internship: Engineering Practice	3	P	T/P/M	T/P/M	T/P/M	P	T/P/M	P	T/P/M	T/P/M	P/M	✓	✓	✓
EE4086	Internship: Advanced Topics in Electrical Engineering	3	P		T/P/M		P					P/M	✓	✓	
EE4087	Internship: Industrial Project	6	P/M	T/P/M	T/P/M	P	P/M	P/M	P/M	P/M	T/P/M	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	MILOs (HKIE Required Outcomes)										DEC		
	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	✓	✓	✓
EE5438 Applied Deep Learning	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			✓	✓	✓
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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