Curriculum Information Record for a Major/Degree

Department of Electrical Engineering
Effective from Summer Term, 2020/21
For Students Admitted/Changed to the Major with Catalogue Term
Semester A 2019/20

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 Language • 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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CSL/sh 30-Jun-15, 15-Jul-16, Updating curriculum map 15-Aug-16, 8-Sep-16, WHL/sh 23-Nov-16, DP/sh 19-Jan-17, DP/sh 17-May-17, JC/sh 6-Jun-18, HMC/sh 19-Nov-18, HMC/sh 15-May-19, sh Dept Name Change 31-May-19, HMS/sh 17-Jun-19, YNS/sh 16-Nov-20, YNS/sh 18-Jan-21
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City University of Hong Kong

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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#	(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**

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**

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 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: 45-57credit units

Course Code	Course Title	Level	Credit Units	Remarks
EE1001	Foundations of Digital Techniques	B1	3	Advanced Standing I/II: Not required
EE1002	Principles of Electronic Engineering	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	
EE2301	Basic Electronic 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
EE3012	Engineers in Society	B3	3	Students having completed EE4081 Professional Internship Program (6CU) are not required to take this course and one other elective. For those who have completed 12-month internship in EE4081 are not required to take EE4097 Engineering Training II.
EE3210	Signals and Systems	B3	3	
EE3220	System-on-Chip Design	B3	3	
EE3070	Design Project	B3	3	Two semesters
EE3315	Internet Technology	B3	3	
EE4146	Data Engineering and Learning Systems	B4	3	
EE4080	Project	B4	6	
EE4096	Engineering Training I	B4	0	Students who have not completed both courses in the training pair EE4096 and EE4097 should take EE4090 Engineering Training as a replacement.
EE4097	Engineering Training II	B4	0	

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 TWO must be from each group.

Group A

Course Code	Course Title	Level	Credit Units	Remarks
EE3209	Data Management Techniques	B3	3	
EE4014	Business Data Communication Networks	B4	3	
EE4016	Engineering Applications of Artificial Intelligence	B4	3	
EE4017	Internet Finance	B4	3	
EE4212	Cryptography and Information Theory	B4	3	

EE4215	Cybersecurity Technology	B4	3	
EE4216	Modern Web Applications	B4	3	
EE4221	Cloud Computing Systems	B4	3	
EE4222	Digital Forensics	B4	3	
EE4316	Mobile Data Networks	B4	3	

Group B

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.
EE3301	Optimization Methods for Engineering	B3	3	Approved implementation date: Sem A 2021/2022
EE4015	Digital Signal Processing	B4	3	
EE4208	Computer Graphics for Engineers	B4	3	
EE4209	Digital Audio Technology	B4	3	
EE4213	Human-Computer Interaction	B4	3	
EE4218	Computer Architecture	B4	3	
EE4211	Computer Vision	B4	3	
EE4304	iOS Mobile App Development and Networking	B4	3	

3. **Optional One-year Internship**

Course Code	Course Title	Level	Credit Units	Remarks
EE4081	Professional Internship Program	B4	6	Students having completed EE4081 Professional Internship Program (6CU) will take one less elective (3CU) and are not required to take EE3012 Engineers in Society (3CU). For those who have completed 12-month internship in EE4081 are not required to take EE4097 Engineering Training II.

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   Curriculum Map

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

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
Core Courses															
EE1001	Foundations of Digital Techniques	3	T/P	T/P	T/P		T/P		T/P			P	✓	✓	
EE1002	Principles of Electronic Engineering	3	T/P				T/P		T/P	P	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	✓	✓	✓
EE2301	Basic Electronic Circuits	3	T/P	T/P/M			T		T			T	✓	✓	
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	✓	✓	
EE3012	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 Learning Systems	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	✓	✓	✓
EE4096	Engineering Training I	0	T/P	P/M	T/P		P			P		T/P	✓	✓	
EE4097	Engineering Training II	0	P	T/P/M	T/P/M	T/P/M	P	P/M	P	P	P/M	T/P/M	✓	✓	✓

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
Electives (choose 15 credits)															
Students are required to take at least FIVE electives of which TWO must be from each group. **Group A**															
EE3209	Data Management Techniques	3	T/P		T/P		T/P					T/P	✓	✓	
EE4014	Business Data Communication Networks	3	T/P		T/P		T/P					P	✓	✓	
EE4016	Engineering Applications of Artificial	3	T/P		T/P		T/P						✓	✓	
EE4017	Internet Finance	3	T/P		T/P		T/P					T/P	✓	✓	
EE4212	Cryptography and Information Theory	3	T/P				T/P						✓	✓	
EE4215	Cybersecurity Technology	3	T/P	T/P	T/P	T/P	T/P		P			P	✓	✓	✓
EE4216	Modern Web Applications	3	T/P		T/P		T/P				P	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/M				T/P	✓	✓	
EE4316	Mobile Data Networks	3	T/P	T/P	T/P	T/P	T/P						✓	✓	
Group B															
CS3391 or	Advanced Programming or	3	T/P		T/P		T/P					P	✓	✓	
CS4335	Design and Analysis of Algorithms	3	T/P		T/P		T/P					P	✓	✓	
EE3301	Optimization Methods for Engineering	3	T/P/M				T/P					T/P/M	✓	✓	
EE4015	Digital Signal Processing	3	T/P		T/P		T/P						✓	✓	
EE4208	Computer Graphics for Engineers	3	T/P		T/P		T/P					P	✓	✓	
EE4209	Digital Audio Technology	3	T/P	T/P	T/P		T/P						✓	✓	
EE4211	Computer Vision	3	T/P		T/P		T/P					T/P	✓	✓	
EE4213	Human-Computer Interaction	3	T/P		T/P		T/P					P	✓	✓	✓
EE4218	Computer Architecture	3	T/P		T/P		T/P			T			✓	✓	
EE4304	iOS Mobile App Development and Networking	3	T/P		T/P	T/P	T/P					P	✓	✓	
Optional One-year Internship															
EE4081	Professional Internship Program	6				P	P	T/P/M	P	T/P/M			✓	✓	✓

Remark: Students having completed EE4081 Professional Internship Program (6CU) will take one less elective (3CU) and are not required to take EE3012 Engineers in Society (3CU). For those who have completed 12-month internship in EE4081 are not required to take EE4097 Engineering Training II. Engineering.

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.