

**Computer Engineering**  
**Applicable to students admitted in 2020-21**

**Major Programme Requirement**

Students are required to complete a minimum of 75 units of courses as follows:

	Units
1. Faculty Package: ENGG1110/ESTR1002, ENGG1120/ESTR1005, ENGG1130/ESTR1006	9
2. Foundation Courses:	
(a) Any one course from the following: Chemistry Courses: CHEM1380 Life Science Courses: LSCI1001, 1003 Physics Courses[a]: ENGG1310/ESTR1003, PHYS1003, 1110	3
(b) CSCI1120/ESTR1100[b]	3
(c) ENGG2720/ESTR2014, ENGG2740/ESTR2016, ENGG2760/ESTR2018, ENGG2780/ESTR2020, MATH1510[c]	11
3. Required Courses:	
(a) CENG2010, 2030, CENG2400/ESTR2100, CENG3420, CSCI2100/ESTR2102, CSCI3100, CSCI3150/ESTR3102, CSCI3190, 3250, 3251, ELEG2202, ENGG2020/ESTR2104	31
(b) Research Component Courses[d]: CENG4998, 4999	6
4. Choose any ONE from the following three options:	12
(a) <u>General Computer Engineering</u> Elective Courses: Choose at least 9 units from the following: CENG3410, CENG3430/ESTR3100, CENG4100, 4120, 4480, 5030, 5050, 5270, CENG5410/ENGG5101, CSCI4180/ESTR4106, CSCI5390, ELEG3205, ELEG4201/4211, IERG4300/ESTR4300 Remaining units can be chosen from the following: AIST/CENG/CSCI/ELEG courses at 2000 or above level, ENGG1820, (ENGG3802 and 3803)	
(b) <u>Stream 1: Embedded Systems</u> Required Courses: CENG3430/ESTR3100, CENG4480 Elective Courses: Remaining units can be chosen from the following: CENG3410, 4100, 5030, 5050, 5430, CSCI3260, 3280, 3310, CSCI4430/ESTR4120, ENGG1820, (ENGG3802 and 3803), IERG4300/ESTR4300, MAEG3060/ESTR3408, MAEG4040/ESTR4414	
(c) <u>Stream 2: VLSI Design and EDA</u> Elective Courses: Choose at least 9 units from the following: CENG3430/ESTR3100, CENG4120, 5030, 5270, ELEG3101, 3202, 3205, 3301, 4211, 4311 Remaining units can be chosen from the following: AIST/CENG/CSCI/ELEG courses at 2000 or above level, ENGG1820, (ENGG3802 and 3803), IERG4300/ESTR4300	
<b>Total:</b>	<b>75</b>

In addition to fulfilling the above Major Programme Requirement, students may also challenge themselves by taking the following stream offered by the Faculty:

Engineering Leadership, Innovation, Technology and Entrepreneurship (ELITE) Stream[e]

Elective Courses:

15 units of courses[f]:

- i) 12 units of ESTR courses of which at most 6 units of courses at 1000 or 2000 level and at least 6 units of courses at 3000 or 4000 level[g]
- ii) 3 units of BMEG/CENG/CSCI/ELEG/ENGG/IERG/MAEG/SEEM courses at 5000 level[h]

Explanatory Notes:

1. Students who have fulfilled the Major Programme Requirements of their respective Engineering programmes (or equivalent courses as approved by the Sub-Committee on Education Technologies) will be eligible to apply for exemption of 1 unit of University Core IT Requirement.  
Students are required to apply for the exemption. When exemption from a particular course is recognized, students can only be exempted from the course but not the units. Please follow the application procedures as announced by the IT Foundation Course Office at <https://engg1000.cse.cuhk.edu.hk>.
2. AIST/BMEG/CENG/CSCI/EEEN/ELEG/ENER/ENGG/ESTR/IERG/MAEG/SEEM courses at 2000 and above level will be included in the calculation of Major GPA for honours classification, excluding courses in Faculty Package and Foundation courses.
  - [a] The Physics course shall be taken in accordance with students' HKDSE results or placement test results as follows:
    - i) Students who have attained Level 4 or above in HKDSE Mathematics (Compulsory Part) AND Level 4 or above in Physics or Level 5 or above in Combined Science with Physics Component shall take ENGG1310/ESTR1003 or PHYS1110.
    - ii) Students with HKDSE results but did not attain the academic levels as stated in (i) shall take PHYS1003.
    - iii) Students without HKDSE results shall sit for the placement test arranged by the Department of Physics. Students who pass the placement test shall take ENGG1310/ESTR1003 or PHYS1110. Students who fail or are absent from the placement test shall take PHYS1003.
  - [b] CSCI1120/ESTR1100 shall be taken in Term 1 of Year 2.
  - [c]
    - i) Non-JUPAS admittees and JUPAS admittees with HKDSE Mathematics Extended Modules I or II are required to attend a Mathematics Placement Test. Students who fail or are absent from the Placement Test will be required to take MATH1020 in the same term when they take MATH1510.
    - ii) JUPAS admittees without HKDSE Mathematics Extended Modules I or II are required to take MATH1020 concurrently with MATH1510.
    - iii) Students who fail MATH1510 in Term 1 will have to retake the course in Term 2. The pre-assigned course, ENGG1130, will also be dropped.
  - [d] Students who have declared to specialize in the ELITE Stream will be required to complete 6 units of ESTR4998 and 4999 to substitute for CENG4998 and 4999.
  - [e] Details of the entrance and coursework requirements, and declaration procedures for the ELITE Stream can be found at the ELITE website ([www.erg.cuhk.edu.hk/elite](http://www.erg.cuhk.edu.hk/elite)).  
Non-ELITE Engineering students may be allowed to take ESTR courses. Students are required to seek approval from their respective Major Programmes for using ESTR courses taken to fulfill the Major Programme Requirement. Details are available at the ELITE website.
  - [f] Students can use up to 9 units of courses which have been taken to fulfill the requirements of items 1 to 4 above to fulfill the elective requirements of the ELITE Stream. Item 3(b) Research Component Courses will not be included in these 9 units. A full list of ESTR courses is available at the ELITE website.
  - [g] Students can use BMEG/CENG/CSCI/ELEG/ENGG/IERG/MAEG/SEEM courses at 5000 level to substitute for ESTR courses at 3000 or 4000 level, subject to the approval of the Stream Director and the Associate Dean (Education).
  - [h] The requirement of at least 3 units of Engineering courses at 5000 level is a requirement for the ELITE Stream only. It should not be interpreted as a requirement of the Major Programme.

	<b>Recommended Course Pattern</b>	<b>Units</b>
<b>First Year of Attendance</b>	1 <sup>st</sup> term Faculty Package: ENGG1110/ESTR1002 Major Required: CHEM1380/ENGG1310/ESTR1003/LSCI1001/1003/ PHYS1003/1110, MATH1510 Major Elective(s):	3 3-6
	2 <sup>nd</sup> term Faculty Package: ENGG1120/ESTR1005, ENGG1130/ESTR1006 Major Required: CHEM1380/ENGG1310/ESTR1003/LSCI1001/1003/ PHYS1003/1110 Major Elective(s):	6 0-3
<b>Second Year of Attendance</b>	1 <sup>st</sup> term Major Required: CENG2010, CSCI1120/ESTR1100, ENGG2020/ ESTR2104, ENGG2720/ESTR2014, ENGG2760/ESTR2018 Major Elective(s):	11
	2 <sup>nd</sup> term Major Required: CENG2030, 3420, CSCI2100/ESTR2102, ENGG2740/ESTR2016, ENGG2780/ESTR2020 Major Elective(s):	13
<b>Third Year of Attendance</b>	1 <sup>st</sup> term Major Required: CENG2400/ESTR2100, CSCI3150/ESTR3102, CSCI3190, ELEG2202 Major Elective(s):	12
	2 <sup>nd</sup> term Major Required: CSCI3100, 3250, 3251 Major Elective(s): 3 units from stream required courses / major elective courses	6 3
<b>Fourth Year of Attendance</b>	1 <sup>st</sup> term Major Required: CENG4998 Major Elective(s): 6 units from stream required courses / major elective courses	3 6
	2 <sup>nd</sup> term Major Required: CENG4999 Major Elective(s): 3 units from major elective courses / stream elective courses	3 3
<b>Total (including Faculty Package):</b>		<b>75</b>

### Course List

<i>Course Code</i>	<i>Course Title</i>	<i>Unit(s)</i>
CENG2010	Digital Logic Design Laboratory	1
CENG2030	Fundamentals of Embedded Systems	3
CENG2400	Embedded System Design	3
CENG3410	Smart Hardware Design	3
CENG3420	Computer Organization and Design	3
CENG3430	Rapid Prototyping of Digital Systems	3
CENG4100	Smartphones: Hardware Platform and Application Development	3
CENG4120	Computer-aided Design for Very Large Scale Integrated Circuits	3
CENG4480	Embedded System Development and Applications	3
CENG4998	Final Year Project I	3
CENG4999	Final Year Project II	3
CENG5030	Energy Efficient Computing	3
CENG5050	Hardware for Human Machine Interface	3
CENG5270	EDA for Physical Design of Digital Systems	3
CENG5410	Advanced Computer Architecture	3
ENGG1310	Engineering Physics: Electromagnetics, Optics and Modern Physics	3
ENGG1820	Engineering Internship	1
ENGG2020	Digital Logic and Systems	3
ENGG2720	Complex Variables for Engineers	2
ENGG2740	Differential Equations for Engineers	2
ENGG2760	Probability for Engineers	2
ENGG2780	Statistics for Engineers	2
ENGG3802	Introduction to Engineering Entrepreneurship	1
ENGG3803	Engineering Entrepreneurship Development Project	2
ENGG5101	Advanced Computer Architecture	3
ESTR1003	Engineering Physics: Electromagnetics, Optics and Modern Physics	3
ESTR2014	Complex Variables for Engineers	2
ESTR2016	Differential Equations for Engineers	2
ESTR2018	Probability for Engineers	2
ESTR2020	Statistics for Engineers	2
ESTR2100	Embedded System Design	3
ESTR2104	Digital Logic and Systems	3
ESTR3100	Rapid Prototyping of Digital Systems	3