**Electronic Engineering**
**Applicable to students admitted in 2015-16**

**Major Programme Requirement**

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

| | | Units |
|---|---|---|
| 1. | Faculty Package:<br>ENGG1100/ESTR1000, ENGG1110/ESTR1002, ENGG2601, 2602 | 9 |
| 2. | Foundation Science Courses: | 9 |
| (a) | 6 units of Physics[a]:<br>ENGG1310/ESTR1003, PHYS1110 | |
| (b) | 3 units of Science Course:<br>CHEM1070, 1280, 1380, CSCI1120, LSCI1001, 1003 | |
| 3. | Foundation Mathematics Courses:<br>ENGG1410/ESTR1004, ENGG2420/ESTR2000, ENGG2450/ ESTR2005, MATH1510[b] | 12 |
| 4. | Required Courses: | |
| (a) | ELEG2201, 2202, 2401, ELEG3201/ESTR3200, ENGG2030/ ESTR2206, ENGG2310/ESTR2300 | 18 |
| (b) | Research Component Courses[c]:<br>ELEG4998, 4999 | 6 |
| 5. | Elective Courses: | |
| (a) | Group A Electives (12 units chosen from the following courses and at least 9 units at 3000 or above level):<br>BMEG3101#/ELEG3101/ESTR3210, BMEG3420#, CSCI1010, 1020, 1030, 1040, 1050, CSCI2100/ESTR2102, CSCI2120, ELEG3202, ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3205, 3207, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG3502, 3503, 3601, 3700/3710, 3701, 3910, ENGG3802, 3803, IERG3310#, SEEM2440/ESTR2500 (or DSME1030)[d] | 12 |
| (b) | Group B Electives (9 units chosen from the following courses):<br>BMEG4103#, BMEG5540#/ELEG5302, EEEN4020#/ENER4020#/ESTR4402, ELEG4201, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4205/4215, 4211, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5101, 5102, 5103, 5104, ELEG5205/ENGG5281, ELEG5210, ELEG5280/ENGG5201, ELEG5301, 5303, 5491, 5501, 5502, ELEG5503/ENGG5202, ELEG5550 | 9 |
| | **Total:** | **75** |

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 completed the courses ENGG1110/ESTR1002, ENGG2601 and 2602 (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. ELEG and ENGG courses at 2000 and above level listed in the Major Programme Requirement, ESTR2104, 2206, 2300, 4402, ESTR4998/4999 and ESTR courses of which the reciprocal departmental courses are ELEG courses as well as those labeled as # will be included in the calculation of Major GPA for honours classification, excluding courses in Faculty Package, Foundation Science courses and Foundation Mathematics courses.
3. Results of the graduation project as prescribed by ELEG4999/ESTR4999 will be included in the calculation for honours classification.
4. Guidance in course selection:
   Students who wish to pursue their career goals as a professional engineer, research scientist, or engineering entrepreneur may take the elective courses as recommended below:

   **Professional Engineering**

   a) Elective course: ELEG3700/3710
   b) ELEG4998 and 4999[c] in a topic of professional engineering nature

   **Research**

   a) Elective courses: ELEG3910 and an ELEG course at 5000 level
   b) ELEG4998 and 4999[c] in a topic of research nature

   **Entrepreneurship**

   a) Elective course: ENGG3802 and 3803
   b) ELEG4998 and 4999[c] in a topic of entrepreneurship nature (related to the project chosen for ENGG3803)

   Apart from the above career tracks, students may also take elective courses according to the particular areas listed below:

| | |
|---|---|
| Biomedical Engineering | BMEG3101/ELEG3101/ESTR3210, BMEG3420, 4103, ELEG5101, 5102, 5103, 5104 |
| DSP and Multimedia Technology | ELEG3502, 3503, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5491, 5501, 5502, ELEG5503/ENGG5202 |
| Integrated Circuit Technology | ELEG3202, 3205, 3207, 4201, 4205/4215, 4211, 4303, 5210, ELEG5280/ENGG5201 |
| Microelectronics and Photonics | BMEG5540/ELEG5302, EEEN4020/ENER4020/ ESTR4402, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG5301, 5303, 5550 |
| Microwave and Wireless | ELEG3203/3213/ESTR3214, |

| | |
|---|---|
| Engineering | ELEG3204/3214/ESTR3202, ELEG3502, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4501/ESTR4212, ELEG4503, ELEG4511/ESTR4218, ELEG5205/ENGG5281 |

[a] Students without HKDSE Physics or who have attained Level 2 or below in HKDSE Physics or Combined Science with Physics component shall take PHYS1003 in advance. PHYS1003 would be counted as a free elective but could not be used to fulfill the Foundation Science course requirements.

[b] Students without HKDSE Mathematics Extended Modules I or II are required to take MATH1020 on top of the 12 units of the Foundation Mathematics Course requirements. MATH1020 will be exempted for students who opt to take and pass the assessment test in the first lecture of MATH1020.

[c] Students who have declared to specialize in the ELITE Stream will be required to complete 6 units of ESTR4998 and 4999 to substitute for ELEG4998 and 4999.

[d] Students can take either one of the courses but not both.

[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). 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 5 above to fulfill the elective requirements of the ELITE Stream. Item 4(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.

| | **Recommended Course Pattern** | Units |
|---|---|---|
| **First Year of Attendance** | 1st term<br>Faculty Package: ENGG1110/ESTR1002<br>Major Required: CHEM1070/1280/1380/CSCI1120/LSCI1001/ 1003, MATH1510, PHYS1110<br>Major Elective(s): | 3<br>6-9 |
| | 2nd term<br>Faculty Package: ENGG1100/ESTR1000<br>Major Required: CHEM1070/1280/1380/CSCI1120/LSCI1001/ 1003, ENGG1310/ESTR1003, ENGG1410/ESTR1004<br>Major Elective(s): | 3<br>6-9 |
| **Second Year of Attendance** | 1st term<br>Major Required: ELEG2201, 2202, ENGG2420/ESTR2000<br>Major Elective(s): | 9 |
| | 2nd term<br>Faculty Package: ENGG2601<br>Major Required: ELEG3201/ESTR3200, ENGG2030/ESTR2206, ENGG2450/ESTR2005<br>Major Elective(s): | 2<br>9 |

| | | |
|---|---|---|
| | Summer session<br>Faculty Package: ENGG2602 | <br>1 |
| **Third Year of Attendance** | 1st term<br>Major Required: ELEG2401, ENGG2310/ESTR2300<br>Major Elective(s): 1 course | <br>6<br>3 |
| | 2nd term<br>Major Required:<br>Major Elective(s): 3 courses | <br><br>9 |
| **Fourth Year of Attendance** | 1st term<br>Major Required: ELEG4998<br>Major Elective(s): 2 courses | <br>3<br>4 |
| | 2nd term<br>Major Required: ELEG4999<br>Major Elective(s): 2 courses | <br>3<br>5 |
| | **Total (including Faculty Package):** | **75** |

**Major Programme Requirement (for Associate Degree holders admitted to senior-year places)**

Students are required to complete a minimum of 54 units of courses as follows:

| | | Units |
|---|---|---|
| 1. | Faculty Package:<br>ENGG1100/ESTR1000 (or ENGG1110/ESTR1002)[a], ENGG2601, 2602 | 6 |
| 2. | Foundation Mathematics Courses:<br>ENGG1410/ESTR1004, ENGG2420/ESTR2000 | 6 |
| 3. | Required Courses: | |
| (a) | ELEG2401, ELEG3201/ESTR3200, ENGG2030/ESTR2206, ENGG2310/ESTR2300 | 12 |
| (b) | Research Component Courses[b]:<br>ELEG4998, 4999 | 6 |
| 4. | Elective Courses: | |
| (a) | Group A Electives (15 units chosen from the following courses and at least 9 units at 3000 or above level):<br>BMEG3101#/ELEG3101/ESTR3210, BMEG3420#, CSCI1010, 1020, 1030, 1040, 1050, CSCI2100/ESTR2102, CSCI2120, ELEG3202, ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3205, 3207, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG3502, 3503, 3601, 3700/3710, 3701, 3910, ENGG3802, 3803, IERG3310#, SEEM2440/ESTR2500 (or DSME1030)[c] | 15 |
| (b) | Group B Electives (9 units chosen from the following courses):<br>BMEG4103#, BMEG5540#/ELEG5302, EEEN4020#/ ENER4020#/ ESTR4402, ELEG4201, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4205/4215, 4211, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5101, 5102, 5103, 5104, ELEG5205/ENGG5281, ELEG5210, ELEG5280/ENGG5201, ELEG5301, 5303, 5491, 5501, 5502, ELEG5503/ENGG5202, ELEG5550 | 9 |
| | **Total:** | **54** |

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**[d]
Elective Courses:
15 units of courses[e]:

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[f]
ii) 3 units of BMEG/CENG/CSCI/ELEG/ENGG/IERG/MAEG/SEEM courses at 5000 level[g]

Explanatory Notes:

1. ELEG and ENGG courses at 2000 and above level listed in the Major Programme Requirement, ESTR2104, 2206, 2300, 4402, ESTR4998/4999 and ESTR courses of which the reciprocal departmental courses are ELEG courses as well as those labeled as # will be included in the calculation of Major GPA for honours classification, excluding courses in Faculty Package, Foundation Science courses and Foundation Mathematics courses.
2. Results of the graduation project as prescribed by ELEG4999/ESTR4999 will be included in the calculation for honours classification.
3. Guidance in course selection:
   Students who wish to pursue their career goals as a professional engineer, research scientist, or engineering entrepreneur may take the elective courses as recommended below:

   **Professional Engineering**
   a) Elective course: ELEG3700/3710
   b) ELEG4998 and 4999[c] in a topic of professional engineering nature

   **Research**
   a) Elective courses: ELEG3910 and an ELEG course at 5000 level
   b) ELEG4998 and 4999[c] in a topic of research nature

   **Entrepreneurship**
   a) Elective course: ENGG3802 and 3803
   b) ELEG4998 and 4999[c] in a topic of entrepreneurship nature (related to the project chosen for ENGG3803)

   Apart from the above career tracks, students may also take elective courses according to the particular areas listed below:

| | |
|---|---|
| Biomedical Engineering | BMEG3101/ELEG3101/ESTR3210, BMEG3420, 4103, ELEG5101, 5102, 5103, 5104 |
| DSP and Multimedia Technology | ELEG3502, 3503, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5491, 5501, 5502, ELEG5503/ENGG5202 |
| Integrated Circuit Technology | ELEG3202, 3205, 3207, 4201, 4205/4215, 4211, 4303, 5210, ELEG5280/ENGG5201 |
| Microelectronics and Photonics | BMEG5540/ELEG5302, EEEN4020/ENER4020/ ESTR4402, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG5301, 5303, 5550 |
| Microwave and Wireless Engineering | ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3502, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4501/ESTR4212, ELEG4503, ELEG4511/ESTR4218, ELEG5205/ENGG5281 |

[a] Students will be required to take either ENGG1100/ESTR1000 or ENGG1110/ESTR1002 based on their admission qualifications.

[b] Students who have declared to specialize in the ELITE Stream will be required to complete 6 units of ESTR4998 and 4999 to substitute for ELEG4998 and 4999.

[c] Students can take either one of the courses but not both.

[d] 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).
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.

[e] 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.

[f] 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).

[g] 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.

| | **Recommended Course Pattern (for Associate Degree holders admitted to senior-year places)** | Units |
|---|---|---|
| **First Year of Attendance** | 1st term<br>Faculty Package: ENGG1100/1110/ESTR1000/1002<br>Major Required: ENGG2310/ESTR2300, ENGG2420/ESTR2000<br>Major Elective(s): | <br>3<br>6 |
| | 2nd term<br>Faculty Package: ENGG2601<br>Major Required: ELEG3201/ESTR3200, ENGG1410/ESTR1004, ENGG2030/ESTR2206<br>Major Elective(s): 2 courses | <br>2<br>9<br>6 |
| | Summer session<br>Faculty Package: ENGG2602 | <br>1 |
| **Second Year of Attendance** | 1st term<br>Major Required: ELEG2401, 4998<br>Major Elective(s): 4 courses | <br>6<br>10 |
| | 2nd term<br>Major Required: ELEG4999<br>Major Elective(s): 3 courses | <br>3<br>8 |
| | **Total (including Faculty Package):** | **54** |

**Major Programme Requirement (for Higher Diploma holders admitted to senior-year places)**

Students are required to complete a minimum of 51 units of courses as follows:

| | | Units |
|---|---|---|
| 1. | Faculty Package:<br>ENGG1100/ESTR1000 (or ENGG1110/ESTR1002)[a], ENGG2601, 2602 | 6 |
| 2. | Foundation Mathematics Courses: | 6 |

| | | |
|---|---|---|
| | ENGG1410/ESTR1004, ENGG2420/ESTR2000 | |
| 3. | Required Courses: | |
| (a) | ELEG2401 (or ENGG2030/ESTR2206)[b], ELEG3201/ESTR3200, ENGG2310/ESTR2300 | 9 |
| (b) | Research Component Courses[c]:<br>ELEG4998, 4999 | 6 |
| 4. | Elective Courses: | |
| (a) | Group A Electives (15 units chosen from the following courses and at least 9 units at 3000 or above level):<br>BMEG3101#/ELEG3101/ESTR3210, BMEG3420#, CSCI1010, 1020, 1030, 1040, 1050, CSCI2100/ESTR2102, CSCI2120, ELEG3202, ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3205, 3207, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG3502, 3503, 3601, 3700/3710, 3701, 3910, ENGG3802, 3803, IERG3310#, SEEM2440/ESTR2500 (or DSME1030)[d] | 15 |
| (b) | Group B Electives (9 units chosen from the following courses):<br>BMEG4103#, BMEG5540#/ELEG5302, EEEN4020#/ ENER4020#/ ESTR4402, ELEG4201, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4205/4215, 4211, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5101, 5102, 5103, 5104, ELEG5205/ENGG5281, ELEG5210, ELEG5280/ENGG5201, ELEG5301, 5303, 5491, 5501, 5502, ELEG5503/ENGG5202, ELEG5550 | 9 |
| | **Total:** | **51** |

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. ELEG and ENGG courses at 2000 and above level listed in the Major Programme Requirement, ESTR2104, 2206, 2300, 4402, ESTR4998/4999 and ESTR courses of which the reciprocal departmental courses are ELEG courses as well as those labeled as # will be included in the calculation of Major GPA for honours classification, excluding courses in Faculty Package, Foundation Science courses and Foundation Mathematics courses.
2. Results of the graduation project as prescribed by ELEG4999/ESTR4999 will be included in the calculation for honours classification.
3. Guidance in course selection:
   Students who wish to pursue their career goals as a professional engineer, research scientist, or engineering entrepreneur may take the elective courses as recommended below:
   **Professional Engineering**
   a) Elective course: ELEG3700/3710
   b) ELEG4998 and 4999[c] in a topic of professional engineering nature
   **Research**

a) Elective courses: ELEG3910 and an ELEG course at 5000 level
b) ELEG4998 and 4999[c] in a topic of research nature

**Entrepreneurship**

a) Elective course: ENGG3802 and 3803
b) ELEG4998 and 4999[c] in a topic of entrepreneurship nature (related to the project chosen for ENGG3803)

Apart from the above career tracks, students may also take elective courses according to the particular areas listed below:

| | |
|---|---|
| Biomedical Engineering | BMEG3101/ELEG3101/ESTR3210, BMEG3420, 4103, ELEG5101, 5102, 5103, 5104 |
| DSP and Multimedia Technology | ELEG3502, 3503, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5491, 5501, 5502, ELEG5503/ENGG5202 |
| Integrated Circuit Technology | ELEG3202, 3205, 3207, 4201, 4205/4215, 4211, 4303, 5210, ELEG5280/ENGG5201 |
| Microelectronics and Photonics | BMEG5540/ELEG5302, EEEN4020/ENER4020/ ESTR4402, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG5301, 5303, 5550 |
| Microwave and Wireless Engineering | ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3502, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4501/ESTR4212, ELEG4503, ELEG4511/ESTR4218, ELEG5205/ENGG5281 |

[a] Students will be required to take either ENGG1100/ESTR1000 or ENGG1110/ESTR1002 based on their admission qualifications.

[b] Students will be required to take either ELEG2401 or ENGG2030/ESTR2206 based on their admission qualifications.

[c] Students who have declared to specialize in the ELITE Stream will be required to complete 6 units of ESTR4998 and 4999 to substitute for ELEG4998 and 4999.

[d] Students can take either one of the courses but not both.

[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).
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.

| | **Recommended Course Pattern (for Higher Diploma holders admitted to senior-year places)** | Units |
|---|---|---|

| | | |
|---|---|---|
| **First Year of Attendance** | 1st term<br>Faculty Package: ENGG1100/1110/ESTR1000/1002<br>Major Required: ENGG2310/ESTR2300, ENGG2420/ESTR2000<br>Major Elective(s): | <br>3<br>6 |
| | 2nd term<br>Faculty Package: ENGG2601<br>Major Required: ELEG3201/ESTR3200, ENGG1410/ESTR1004, ENGG2030/ESTR2206[a]<br>Major Elective(s): 1-2 course(s) | <br>2<br>6-9<br><br>3-6 |
| | Summer session<br>Faculty Package: ENGG2602 | <br>1 |
| **Second Year of Attendance** | 1st term<br>Major Required: ELEG2401[a], 4998<br>Major Elective(s): 4-5 courses | <br>3-6<br>10-13 |
| | 2nd term<br>Major Required: ELEG4999<br>Major Elective(s): 3 courses | <br>3<br>8 |
| | **Total (including Faculty Package):** | **51** |
| [a] Either one as required by the Department. | | |

Bachelor of Engineering (Electronic Engineering) and Bachelor of Business Administration (Integrated BBA Programme) Double Degree Option

**1st Degree: Bachelor of Engineering (Electronic Engineering)**

**Major Programme Requirement**

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

| | | Units |
|---|---|---|
| 1. | Faculty Package:<br>ENGG1100/ESTR1000, ENGG1110/ESTR1002, ENGG2601, 2602 | 9 |
| 2. | Foundation Science Courses: | 9 |
| (a) | 6 units of Physics[a]:<br>ENGG1310/ESTR1003, PHYS1110 | |
| (b) | 3 units of Science Course:<br>CHEM1070, 1280, 1380, CSCI1120, LSCI1001, 1003 | |
| 3. | Foundation Mathematics Courses:<br>ENGG1410/ESTR1004, ENGG2420/ESTR2000, ENGG2450/ ESTR2005, MATH1510[b] | 12 |
| 4. | Required Courses: | |
| (a) | ELEG2201, 2202, 2401, ELEG3201/ESTR3200, ENGG2030/ ESTR2206, ENGG2310/ESTR2300 | 18 |
| (b) | Research Component Courses[c]:<br>ELEG4998, 4999 | 6 |
| 5. | Elective Courses: | |
| (a) | Group A Electives (12 units chosen from the following courses and at least 9 units at 3000 or above level):<br>BMEG3101#/ELEG3101/ESTR3210, BMEG3420#, CSCI1010, 1020, | 12 |

| | | |
|---|---|---|
| | 1030, 1040, 1050, CSCI2100/ESTR2102, CSCI2120, ELEG3202, ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3205, 3207, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG3502, 3503, 3601, 3700/3710, 3701, 3910, ENGG3802, 3803, IERG3310#, SEEM2440/ESTR2500 (or DSME1030)[d] | |
| (b) | Group B Electives (9 units chosen from the following courses): BMEG4103#, BMEG5540#/ELEG5302, EEEN4020#/ENER4020#/ ESTR4402, ELEG4201, ELEG4203/ESTR4206, ELEG4204/ ESTR4208, ELEG4205/4215, 4211, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5101, 5102, 5103, 5104, ELEG5205/ENGG5281, ELEG5210, ELEG5280/ENGG5201, ELEG5301, 5303, 5491, 5501, 5502, ELEG5503/ENGG5202, ELEG5550 | 9 |
| | **Total:** | **75** |

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 completed the courses ENGG1110/ESTR1002, ENGG2601 and 2602 (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. Students are advised to take some courses of the University Core Requirements or Major courses in summer sessions to reduce their course load in regular terms.
3. ELEG and ENGG courses at 2000 and above level listed in the Major Programme Requirement, ESTR2104, 2206, 2300, 4402, ESTR4998/4999 and ESTR courses of which the reciprocal departmental courses are ELEG courses as well as those labeled as # will be included in the calculation of Major GPA for honours classification, excluding courses in Faculty Package, Foundation Science courses and Foundation Mathematics courses.
4. Results of the graduation project as prescribed by ELEG4999/ESTR4999 will be included in the calculation for honours classification.
5. Guidance in course selection:
   Students who wish to pursue their career goals as a professional engineer, research scientist, or engineering entrepreneur may take the elective courses as recommended below:
   **Professional Engineering**
   a) Elective course: ELEG3700/3710
   b) ELEG4998 and 4999[c] in a topic of professional engineering nature
   **Research**
   a) Elective courses: ELEG3910 and an ELEG course at 5000 level
   b) ELEG4998 and 4999[c] in a topic of research nature

**Entrepreneurship**

a) Elective course: ENGG3802 and 3803

b) ELEG4998 and 4999[c] in a topic of entrepreneurship nature (related to the project chosen for ENGG3803)

Apart from the above career tracks, students may also take elective courses according to the particular areas listed below:

| | |
|---|---|
| Biomedical Engineering | BMEG3101/ELEG3101/ESTR3210, BMEG3420, 4103, ELEG5101, 5102, 5103, 5104 |
| DSP and Multimedia Technology | ELEG3502, 3503, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5491, 5501, 5502, ELEG5503/ENGG5202 |
| Integrated Circuit Technology | ELEG3202, 3205, 3207, 4201, 4205/4215, 4211, 4303, 5210, ELEG5280/ENGG5201 |
| Microelectronics and Photonics | BMEG5540/ELEG5302, EEEN4020/ENER4020/ ESTR4402, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG5301, 5303, 5550 |
| Microwave and Wireless Engineering | ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3502, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4501/ESTR4212, ELEG4503, ELEG4511/ESTR4218, ELEG5205/ENGG5281 |

[a] Students without HKDSE Physics or who have attained Level 2 or below in HKDSE Physics or Combined Science with Physics component shall take PHYS1003 in advance. PHYS1003 would be counted as a free elective but could not be used to fulfill the Foundation Science course requirements.

[b] Students without HKDSE Mathematics Extended Modules I or II are required to take MATH1020 on top of the 12 units of the Foundation Mathematics Course requirements. MATH1020 will be exempted for students who opt to take and pass the assessment test which will be held in the first lecture of MATH1020.

[c] Students who have declared to specialize in the ELITE Stream will be required to complete 6 units of ESTR4998 and 4999 to substitute for ELEG4998 and 4999.

[d] Students can take either one of the courses but not both.

[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).
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 5 above to fulfill the elective requirements of the ELITE Stream. Item 4(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.

Requirements for admission to the 2nd degree programme

1. Admission to the second degree programme is guaranteed if students have:

   i. fulfilled all graduation requirements of the first degree programme;
   ii. Major GPA of at least 3.0 upon completion of studies of the first degree programme (ERG); and
   iii. taken at least 30 relevant units, of which includes ELTU2014, ELTU3014 and mutually recognized courses by both the Engineering and Business Administration Faculties. In addition, students should have achieved a GPA of at least 3.0 in these courses while pursuing the first degree programme. For details of the mutually recognized courses, please refer to the explanatory notes on mutual recognition or exclusion.

   Students who do not satisfy the above requirements may still apply for admission to the second degree programme which has discretion to judge the suitability of the students for studying for the second degree through assessments like conducting interview, considering the recommendation from the first degree programme etc.

   Upon fulfillment of the requirements of the first degree programme, students can still choose to or not to pursue the second degree programme. If a student decides not to pursue the second degree programme but has fulfilled the requirements of a relevant BBA minor programme, a minor of that BBA programme would be awarded.

**2nd Degree: Bachelor of Business Administration (Integrated BBA Programme)**

**Major Programme Requirement**

Students are required to complete a minimum of 55 units of courses as follows:

| | | Units |
|---|---|---|
| 1. | Faculty Package:<br>DSME1030, 1040, MGNT1020 | 9 |
| 2. | Required Courses:<br>ACCT2111, 2121, DSME2011, 2030, 2051, FINA2010, MGNT2510, 2610, 4010, MKTG2010 | 31 |
| 3. | Elective Courses (Concentration):<br>Students must choose at least one concentration and take five or six courses among the courses prescribed under respective concentration area as follows: | 15-18 |

(a) Business Economics
   (i) DSME2021, 4110;
   (ii) two courses selected from: DSME3030, 3050, 3080, 3090, 4040, 4080; and
   (iii) one DSME course at 3000 or above level, excluding the courses taken for fulfillment of requirement (i) or (ii)

(b) Business Analytics
   (i) DSME2021, 4020, 4070;
   (ii) one course selected from: DSME4240, 4260; and
   (iii) one course selected from: DSME3030, 4030, 4110, 4220, 4280, MKTG4120

(c) General Finance
   (i) DSME2021 or FINA2020;
   (ii) 12 units of FINA courses at 3000 or above level, with no more than three 1-unit FINA courses, excluding the courses taken for

fulfillment of requirement (iii); and

(iii) one course from FINA3070, 3080, 4040, 4130, 4140, 4390

(d) Financial Engineering

(i) DSME2021 or FINA2020;

(ii) four courses selected from: FINA3080, 3220, 4110, 4120, 4150, 4160, 4190, 4210, 4220, 4250, 4260, 4370, 4380; and

(iii) one course from FINA4040, 4130, 4140, 4390

(e) Insurance and Risk Management

(i) DSME2021 or FINA2020, and FINA3210;

(ii) three courses selected from: FINA2210, 3080, 3230, 3240, 3280, 4230, 4240; and

(iii) one course from FINA4040, 4130, 4140, 4270, 4291, 4390

(f) Management of International Business

(i) MGNT3580, 4150, MKTG3010; and

(ii) three courses selected from: MGNT3010, 3080, 4080, 4090, 4130, 4140, 4510, 4530, 4540, 4550, 4570, 4600, 4620

(g) Human Resource Management

(i) MGNT2040, 3010, MKTG3010; and

(ii) three courses selected from: MGNT3040, 3060, 3090, 4050, 4060, 4080, 4110, 4130, 4140, 4620

(h) Marketing

(i) MKTG3010, 3020, 3030, 4040; and

(ii) two courses selected from: MKTG3040, 3050, 3060, 4010, 4020, 4030, 4050, 4070, 4080, 4090, 4100, 4110,4160

(i) Quantitative Marketing

(i) MKTG3010, 4080, 4090, 4120; and

(ii) two courses selected from: MKTG3020, 3030, 3060, 4030, 4040, 4070, 4130, 4150, 4160

(j) General Business

(i) DSME2021/FINA2020/MKTG3010; and

(ii) 12 units of DSME/FINA/MGNT/MKTG courses at 3000 or above level, excluding the courses taken for fulfillment of requirement (i), with no more than three 1-unit FINA courses

**Total: 55-58**

Explanatory Notes:

1. ACCT/DSME/FINA/IBBA/MGNT/MKTG courses at 2000 and above level (excluding ACCT2111 and 2121) will be included in the calculation of Major GPA for honours classification.
2. Double concentrations (i) among the finance-related concentration areas (i.e. any combination of General Finance, Financial Engineering, Insurance and Risk Management), and (ii) in Marketing and Quantitative Marketing are not allowed.
3. DSME2021 and the associated units can be used to satisfy concentration requirements of double concentrations within (a) to (e) and (j), except for the impermissible combination of concentrations as stipulated in Note 2 above.

   MKTG3010 and the associated units can be used to satisfy concentration requirements of double concentrations within (f) to (j), except for the impermissible combination of concentrations as stipulated in Note 2 above.

   FINA2020 and the associated units can be used to satisfy concentration requirements of double concentrations within (c) to (e) and (j), except for the impermissible combination of concentrations as stipulated in Note 2 above.

   MGNT3010 and the associated units can be used to satisfy concentration requirements of double concentrations within (f) and (g).

Explanatory Notes on Mutual Recognition or Exclusion:

1. DSME1030 and the associated units can be used to satisfy both the requirements of the first and second degrees.
2. DSME2011 and the associated units can be exempted from the requirement of the second degree by successfully completing ENGG2450/ESTR2005.
3. DSME4140 and the associated units can be exempted from the requirement of the second degree by successfully completing IERG3310.

**Recommended Course Pattern**

| | **1st degree: Bachelor of Engineering (Electronic Engineering)** | Units | **2nd degree: Bachelor of Business Administration (Integrated BBA Programme)** | Units |
|---|---|---|---|---|
| **First Year of Attendance** | 1st term<br>Faculty Package: ENGG1110/ESTR1002<br>Major Required: CHEM1070/1280/1380/ CSCI1120/LSCI1001/1003, MATH1510, PHYS1110<br>Major Elective(s): | <br>3<br>6-9 | 1st term<br>Faculty Package:<br>Major Required:<br>Major Elective(s): | |
| | 2nd term<br>Faculty Package: ENGG1100/ESTR1000<br>Major Required: CHEM1070/1280/1380/ CSCI1120/LSCI1001/1003, ENGG1310/ESTR1003, ENGG1410/ESTR1004<br>Major Elective(s): | <br>3<br>6-9 | 2nd term<br>Faculty Package:<br>Major Required:<br>Major Elective(s): | |
| | | | Summer session<br>Faculty Package: DSME1030/ 1040 | 3 |
| **Second Year of Attendance** | 1st term<br>Major Required: ELEG2201, 2202, ENGG2420/ESTR2000<br>Major Elective(s): | <br>9 | 1st term<br>Faculty Package: DSME1030/ 1040<br>Major Required:<br>Major Elective(s): | 3 |
| | 2nd term<br>Faculty Package: ENGG2601<br>Major Required: ELEG3201/ESTR3200, ENGG2030/ESTR2206, ENGG2450/ESTR2005<br>Major Elective(s): | <br>2<br>9 | 2nd term<br>Major Required:<br>Major Elective(s): | |
| | Summer session<br>Faculty Package: ENGG2602 | <br>1 | Summer session<br>Faculty Package: MGNT1020 | 3 |
| **Third Year of** | 1st term | | 1st term | |

| | | | | |
|---|---|---|---|---|
| **Attendance** | Major Required: ELEG2401, ENGG2310/ESTR2300<br>Major Elective(s): Group A Elective | 6<br>3 | Major Required/Major Elective(s): | |
| | 2nd term<br>Major Required:<br>Major Elective(s): Group A Electives | <br><br>6 | 2nd term<br>Major Required/Major Elective(s): | 9 |
| **Fourth Year of Attendance** | 1st term<br>Major Required: ELEG4998<br>Major Elective(s):<br>Group A Elective<br>Group B Elective | <br>3<br><br>3<br>3 | 1st term<br>Major Required/Major Elective(s): | 6 |
| | 2nd term<br>Major Required: ELEG4999<br>Major Elective(s): Group B Electives | <br>3<br>6 | 2nd term<br>Major Required/Major Elective(s): | 6 |
| **Fifth Year of Attendance** | | | 1st term<br>Major Required/Major Elective(s): | 12-15 |
| | | | 2nd term<br>Major Required/Major Elective(s): | 13 |
| | **Total (including Faculty Package):** | **75** | **Total (including Faculty Package):** | **55-58** |

**Minor Programme Title**
Electronic Engineering

**Minor Programme Requirement**

Students are required to complete a minimum of 18 units of courses as follows:

| | | Units |
|---|---|---|
| 1. | Required Courses:<br>ELEG2201, 2202[a], ENGG2030/ESTR2206 | 9 |
| 2. | Elective Courses (at least 6 units of courses at 3000 or above level):<br>BMEG3101/ELEG3101/ESTR3210, BMEG5540/ELEG5302, ELEG2401, ELEG3201/ESTR3200, ELEG3202, ELEG3203/3213/ESTR3214, ELEG3204/3214/ESTR3202, ELEG3205, 3207, ELEG3301/ESTR3204, ELEG3302, ELEG3303/ESTR3206, ELEG3502, 3503, 3601, 4201, ELEG4203/ESTR4206, ELEG4204/ESTR4208, ELEG4205/4215, 4211, ELEG4213/ESTR4220, ELEG4214/ESTR4222, ELEG4301/ESTR4210, ELEG4302/4312, 4303, ELEG4311/ESTR4216, ELEG4501/ESTR4212, ELEG4502/4512, 4503, ELEG4511/ESTR4218, ELEG5101, 5102, 5103, 5104, ELEG5205/ENGG5281, ELEG5210, ELEG5280/ENGG5201, ELEG5301, 5303, 5491, 5501, 5502, ELEG5503/ENGG5202, ELEG5550, ENGG2310/ESTR2300 | 9 |
| | **Total:** | **18** |

Explanatory Note:

[a] BMEG2300 is equivalent to ELEG2202.

| Course List | | |
|---|---|---|
| *Course Code* | *Course Title* | *Unit(s)* |
| ELEG2201 | Digital Circuits and Computing Systems | 3 |
| ELEG2202 | Fundamentals of Electric Circuits | 3 |
| ELEG2401 | Introduction to Embedded Systems | 3 |
| ELEG3101 | Medical Instrumentation and Sensors | 3 |
| ELEG3201 | Microelectronic Devices and Circuits | 3 |
| ELEG3202 | Analog Integrated Circuits | 3 |
| ELEG3203 | Electromagnetic Fields and Waves | 3 |
| ELEG3204 | Wireless Technology and Systems | 3 |
| ELEG3205 | Modern Digital Circuit Design | 3 |
| ELEG3207 | Introduction to Power Electronics | 3 |
| ELEG3213 | Fundamentals of Applied Electromagnetics | 3 |
| ELEG3214 | Antennas and Wave Propagation for Wireless Communications | 3 |
| ELEG3301 | Principles of Semiconductor Devices | 3 |
| ELEG3302 | Fundamentals of Photonics | 3 |
| ELEG3303 | Introduction to Optical Communications | 3 |
| ELEG3502 | Analog and Digital Communications | 3 |
| ELEG3503 | Introduction to Digital Signal Processing | 3 |
| ELEG3601 | Introduction to Electric Power Systems | 3 |
| ELEG3700 | Electronic Product Design and Development | 2 |
| ELEG3701 | Embedded Systems Design | 3 |
| ELEG3710 | Electronic Product Design and Development | 3 |
| ELEG3910 | Undergraduate Research in Electronic Engineering | 2 |
| ELEG4201 | CMOS Integrated Circuits | 2 |
| ELEG4203 | Radio Frequency Electronics | 2 |
| ELEG4204 | Advanced Radio Frequency Circuit Design | 2 |
| ELEG4205 | Power Converter Circuits | 2 |
| ELEG4211 | CMOS Digital Integrated Circuits Design | 3 |
| ELEG4213 | Radio Frequency Electronics | 3 |
| ELEG4214 | RF Circuits for Wireless Systems | 3 |
| ELEG4215 | Power Converter Circuits | 3 |
| ELEG4301 | Physics and Technology of Semiconductor Devices | 2 |
| ELEG4302 | Microoptics | 2 |
| ELEG4303 | Integrated Circuits Fabrication Technology | 2 |
| ELEG4311 | Physics and Technology of Semiconductor Devices | 3 |
| ELEG4312 | Micro-optic Devices and Systems | 3 |
| ELEG4501 | Digital Signal Processing and Applications | 2 |
| ELEG4502 | Digital Image Processing | 2 |
| ELEG4503 | Modern Communication Systems | 2 |
| ELEG4511 | Digital Signal Processing and Applications | 3 |
| ELEG4512 | Digital Image Processing | 3 |
| ELEG4998 | Final Year Project I | 3 |
| ELEG4999 | Final Year Project II | 3 |
| ELEG5101 | Advanced Medical Instrumentation and Biosensors | 3 |
| ELEG5102 | Biomedical and Health Informatics | 3 |
| ELEG5103 | Prosthetics and Artificial Organs | 3 |
| ELEG5104 | Introduction to Biomimetic Engineering | 3 |
| ELEG5205 | Advanced Microwave Engineering | 3 |

| | | |
|---|---|---|
| ELEG5210 | CMOS Analog Integrated Circuits | 3 |
| ELEG5280 | Analog-Digital ASIC Design | 3 |
| ELEG5301 | Photonic Integrated Circuits | 3 |
| ELEG5302 | Biophotonics | 3 |
| ELEG5303 | Flexible Electronics – Physics and Technology | 3 |
| ELEG5491 | Introduction to Deep Learning | 3 |
| ELEG5501 | Speech and Audio Processing | 3 |
| ELEG5502 | Video Coding Technology | 3 |
| ELEG5503 | Pattern Recognition | 3 |
| ELEG5550 | Micro- and Nano-Fabrication Laboratory | 3 |
| ENGG1310 | Engineering Physics: Electromagnetics, Optics and Modern Physics | 3 |
| ENGG1410 | Linear Algebra and Vector Calculus for Engineers | 3 |
| ENGG2030 | Signals and Systems | 3 |
| ENGG2310 | Principles of Communication Systems | 3 |
| ENGG2420 | Complex Analysis and Differential Equations for Engineers | 3 |
| ENGG2450 | Probability and Statistics for Engineers | 3 |
| ENGG3802 | Introduction to Engineering Entrepreneurship | 1 |
| ENGG3803 | Engineering Entrepreneurship Development Project | 2 |
| ENGG5201 | Analog-Digital ASIC Design | 3 |
| ENGG5202 | Pattern Recognition | 3 |
| ENGG5281 | Advanced Microwave Engineering | 3 |
| ESTR1003 | Engineering Physics: Electromagnetics, Optics and Modern Physics | 3 |
| ESTR1004 | Linear Algebra and Vector Calculus for Engineers | 3 |
| ESTR2000 | Complex Analysis and Differential Equations for Engineers | 3 |
| ESTR2005 | Probability and Statistics for Engineers | 3 |
| ESTR2206 | Signals and Systems | 3 |
| ESTR2300 | Principles of Communication Systems | 3 |
| ESTR3200 | Microelectronic Devices and Circuits | 3 |
| ESTR3202 | Wireless Technology and Systems | 3 |
| ESTR3204 | Principles of Semiconductor Devices | 3 |
| ESTR3206 | Introduction to Optical Communications | 3 |
| ESTR3210 | Medical Instrumentation and Sensors | 3 |
| ESTR3214 | Fundamentals of Applied Electromagnetics | 3 |
| ESTR4206 | Radio Frequency Electronics | 2 |
| ESTR4208 | Advanced Radio Frequency Circuit Design | 2 |
| ESTR4210 | Physics and Technology of Semiconductor Devices | 2 |
| ESTR4212 | Digital Signal Processing and Applications | 2 |
| ESTR4216 | Physics and Technology of Semiconductor Devices | 3 |
| ESTR4218 | Digital Signal Processing and Applications | 3 |
| ESTR4220 | Radio Frequency Electronics | 3 |
| ESTR4222 | RF Circuits for Wireless Systems | 3 |