A student wishing to use courses not on this list must secure advance approval from the Department by means of a petition.

The approved Directed Electives generally include: courses required for entry into other engineering majors; required and technical elective courses in other engineering majors; pre-med courses; business or entrepreneurship courses; math, statistics, physics and chemistry courses at higher level than required in the ECE core; and other physical science or biological science courses. For physical science or biological science courses a maximum of 7 hours numbered below 2000 may be counted as Directed Electives.

Individual studies or undergraduate research courses in other engineering disciplines, math, statistics, and physical or biological sciences typically may also be used as directed electives. There are limits on the total number of hours of such courses that may count toward the BSECE degree. Students should consult with their advisor to verify that such courses in a particular discipline will count, prior to taking the course.

If two classes have exclusion clauses in the OSU course catalog then only one of them may be used. Quarter courses are listed in parentheses. When both semester and quarter versions of a course are listed only one of them may be used.

Directed Electives are not required in the Electrical Engineering or Computer Engineering programs. ECE majors are encouraged to use ECE technical electives to complete their elective requirements.

The Approved Directed Electives for the Electrical Engineering and Computer Engineering programs of study are different. If you are in the Electrical Engineering program of study this is not the correct list for you.

### Special Cases

<table>
<thead>
<tr>
<th>Special Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>Only one of the following courses may count:</td>
</tr>
<tr>
<td></td>
<td>ANATOMY 2220, ANATOMY 2300(199), ANATOMY 3300(200), or EEOB 2510†(235†)</td>
</tr>
</tbody>
</table>
| Engineering Service Learning | • A maximum of three hours of ENGR 4692.01S or 4692.02S may be counted as Directed Elective.  
|                       | • A maximum of three hours from the following set may be counted as Directed Elective: ENGR 2797.11, 5797.115, 5797.14, 5797.165, or 5797.175 |
| Leadership            | Only one of the following courses may count:                                 |
|                       | ENGR 5680(680) or MECHENG 4194 Class Nbr 24098 in May term 2015             |
| Music                 | The following electronic music synthesis and recording classes may count:     |
|                       | MUSIC 5636.01(636), 5636.02, 5638(638), and 5639(639)                       |
| Thermodynamics        | Only one of the following courses may count:                                 |
|                       | AEROENG 2405(405), CHBE 3508(508,509), FABENG 2120, FABENG 3120, MATSCEN 2251(401), MECHENG 3500(500), or MECHENG 3501(501, 502) |
| Cross-listed courses | Only one of the following sets may count:                                    |
|                       | • CSE 1221 or ENGR 1221                                                    |
|                       | • CHBE 5769(769) or BIOMEDE 5661(761)                                       |
|                       | • MECHENG 5682(682), 5682.01, or 5682.02; or ISE 5682(682), 5682.01, or 5560 |
|                       | • CIVILEN 5168(768), MATH 5168, or MECHENG 5168(768)                        |
|                       | • ENVENG 5600 or PUBAFRS 5600                                              |

† also counts toward the 32 hour Math and Basic Science requirement
## Other Engineering Disciplines

### Aeronautical & Astronautical*
- AEROENG 2200(200), 2201(201), and 3581(581)

### Aviation
- AVIATN 2000(300, 322), 2100(310.01), 2101(341), 2102(342), 2300(410), and 3000(550, 654)

### Biomedical*
- BIOMEDE 2000(202), 2700(205), 5186(686), 5001(701), 5210(721), 5310(631), 5352(732), 5353(733), 5359(739), 5421(741), 5663(763), 5771(771), (500), (571), and (600)
- BIOMED 4901 may count as directed elective for students doing an approved multidisciplinary capstone design in Biomedical Engineering, but may not substitute for ECE 3090 or 4900

### Chemical & Biomolecular*
- CHBE 2200(200, 201), 2420(420, 521), and 2523(523)

### Civil Engineering*
- CIVILEN 2060(406), 3130(413), 3310(431), and 3510(451)

### Computer Science and Engineering*
- CSE 2122(230) and CSE 2331(680)
- CSE 3231(757), 3232(616), 3321(625), 3341(655), 3521(630), 3541(683), 3901, 3902, and 3903
- CSE 4251(459.11), 4252(459.22), 4253(459.24), 4254(459.31), 4255(459.51), 4471(551), and 4521
- CSE 5234(769), 5235, 5236, 5243(674), 5245, 5343(756), 5351(723), 5432, 5433(662), 5434, 5462, 5472(652), 5473(651), 5522(730), 5524(634), 5525(733), 5526(779), 5531(612), 5542(781), 5543(784), 5544, and 5545(782)
- CSE 5911(758, 762), 5912(786), 5913(682), 5914(731), and 5915(772) may count as directed electives, but may not substitute for ECE 4900
- Please note that CSE 1110, 1111, 1112, 1113, 1114, 1211, 1212, 1223, 2112, 2123(214), and 3430 do not count as directed electives in this program of study.

### Engineering*
- ENGR 5901.01 may count as directed elective, but may not substitute for ECE 3090 or 4900
- One of ENGR 4410.01(410) or FABENG 3171.
- ENGR 4410.02, 5168, 5050, and 5710.
- ENGR 4692.015. A maximum of three hours of this repeatable course may be counted as Directed Elective.
- ENGR 4891.01 and 5695. These S/U graded course count against the cap on hours of S/U electives toward the degree. Only one instance of each of these repeatable courses count as Directed Elective.
- ENGR 4891.02. Only one instance of this repeatable course counts as Directed Elective.
- ENGR 4910. This S/U graded course counts against the cap on hours of S/U electives toward the degree.
- Please note that ENGR 2167 does not count as directed elective.

### Environmental
- ENVENG 2100(610), 3200(511), and 3210(520)

### Food, Agricultural & Biological*
- FABENG 2110(325), 2710(373), and 2720(373)
- One of FABEEENG 3171 or ENGR 4410.01.

### Industrial & Systems*
- ISE 2400(560), ISE 2500(350), ISE 3230, ISE 3400(541), 3800(681), (410), (600), (601), (752.01)

### Materials Science & Engineering*
- MATSCEN 2241 (341, 342), 2331 (282), 2321, and 5572
- MATSCEN 2010(205) may be used only if ECE 331 has not been taken.
- MATSCEN 5971 may not be used
### Other Engineering Disciplines

**Mechanical***  
- MECHENG 2010(410) and 2020(420), or 2040. If 2040 is used then 2010(410) and 2020(420) may not be used.  
- MECHENG 2030(430), 2850(250), 2900, 5665(776.01) and 5666(776.02, 776.03).  
- Up to 3 hr combined total of MECHENG 2651(652.01) and 2652(652.02) may be used.  
- (Any 500-level or above quarter course, excluding 571 and 773, which is not directly comparable to an ECE course. Up to 6 Qhr of 580 may be used.)

**Nuclear**  
- Any 4000-level or 5000-level NUCLREN course  
- (Any 500-level or higher quarter course)

**Welding**  
- WELDENG 3001(300) and 3601 (350, 351)

‡ Many courses in other engineering disciplines require admission to that major. The presence of such courses in this list does not imply that the major prerequisite is waived. Such courses are pre-approved to count as directed electives for students who switch to the ECE major after having already taken those courses.

* also see special cases table above

### Math, Statistics, and Physical and Biological Sciences

Unless otherwise noted, the Directed Elective courses in this table also count toward the 32 hour Math and Basic Science requirement

<table>
<thead>
<tr>
<th>Animal Sciences</th>
<th>ANIMSCI 3140(310)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>ANTHROP 2200(200)</td>
</tr>
</tbody>
</table>
| Astronomy       | ASTRON 2291 (291) or (161)  
|                 | ASTRON 2292 (292) or (162) |
| Atmospheric     | One of ATMOSSC 2940 (230) or GEOG 1900 (120) may be used  
| Sciences        | ATMOSSC 5950 (631)  
| Geography       | GEOG 3900(420) |

<table>
<thead>
<tr>
<th>Biochemistry</th>
<th>BIOCHEM 4511 (511)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>BIOLOGY 1113 (113), 1114 (114), 2100</td>
</tr>
</tbody>
</table>
| Chemistry       | CHEM (125), 2520 (252), (253), 2540 (254), and 2550 (255)  
|                 | One course from this set: [CHEM 2310 (231) or 2510 (251)]  
|                 | One of CHEM 1210, 1610 or 1910H may be used, however students with credit for 1210, 1610 or 1910H must take 1220, 1620 or 1920H to complete their ECE chemistry requirement. CHEM 1220, 1620 or 1920H will count toward the degree in place of CHEM 1250, not as a directed elective.  
|                 | Should a student with AP credit for CHEM 1210 obtain permission to take CHEM 1250 instead of continuing into 1220, only 2 hr of CHEM 1210 may be used as Directed Elective. |
| Earth Science   | EARTHSC 1121 (121), 1122 (122), and 1151 (151) |
| Entomology      | One of ENTMLGY 3330(333) or 4440H(444H)  
|                 | ENTMLGY 4600 |
| Environment and | ENR 2100(201), 3000(300.01), and 3001(300.02) |
| Natural Resources |

| Evolution, Ecology, & Organismal Biology* | EEOB 2520 (232)  
|                                          | One of EEOB 3310 (400) or 3310H (400H)  
|                                          | EEOB 3494 [does not count toward 32 hour Math and Basic Science requirement] |
Math, Statistics, and Physical and Biological Sciences
Unless otherwise noted, the Directed Elective courses in this table also count toward the 32 hour Math and Basic Science requirement

<table>
<thead>
<tr>
<th>Food Science &amp; Technology</th>
<th>FDSCTE 2200(201)</th>
</tr>
</thead>
</table>
| Horticulture & Crop Science or Molecular Genetics | • One of HCS 2201 (300) or MOLGEN 3300  
• HCS 2202 (310) |
| Mathematics* | • MATH 2566 (566); 3345(345); 3607; 4350; 4507; 4547 (548); 4548 (549); 4551 (513 or 551); 4573 (573); 4575 (575); 4578 (578); 5101 (572 or 601); (602); 5102 (603.02); 5451 (701); and 5603  
• One of MATH 4512 (512) or 4557 (557)  
• One of MATH 4552 (514 or 552) or (654)  
• Please note that MATH (530), (568) and (571) may not be used as directed electives |
| Microbiology | MICRBO 4000 (509) |
| Neuroscience | NEUROSC 3000, 3010 |
| Physics | • PHYSICS 2300 (261, 262), 2301 (263), 3700 (416), 5300 (664), 5500 or 5500H (631, 632), 5501H (633), 5600, 5740  
• PHYSICS 3201H does not count as a directed elective. It may count as a GE VPA course.  
• (Any 500-level or higher quarter course; excluding 517, 525, 555, 596, 617, 656, 657, 670, and 759; that is not directly comparable to an ECE or other engineering course.) |
| Psychology | PSYCH 3313 |
| Statistics | STAT 3201, 3202, 3301, 3302, 3303, 4288, 4620 |

*also see special cases table above

Business, Entrepreneurship and Economics

| BUSADM | 3640(504.01), 3641(504.02) |
| BUSFIN | • One of 3120(420) or 3220(620) may be used  
• 3290(590), 3500(510), and 4510 |
| BUSMGT | One of 3130(430) or 3230(630) may be used |
| BUSMHR | • 2000(BUSADM 555), 3541, 3542, 3665(390) and 5530(or one of 691 or 694.52)  
• One of 3510, 3510.01(490), or 3510.02(490.02) may be used.  
• One of 3100(400), 3200(701), or 3300(660) may be used  
• One of 3520 or 4520E(590) may be used |
| BUSML | • 3241(490) and 3380(780)  
• One of 3150(450) or 3250(650) may be used |
| Economics | • One of ECON 4001.02(501.02) or 4001.03 may be used  
• One of ECON 4002.02(502.02) or 4002.03 may be used  
• One of ECON 4400(444) or 5410(641) may be used  
• ECON 4200(520), 4700(570), and 5001(601) |

Please note that ECON 4001.01(501.01) and 4002.01(502.01) may not be used as directed electives