

McKelvey School of Engineering
BS in Systems Science & Engineering Curriculum¹
2025-2026 Catalog Year, 3/24/2025

FIRST YEAR

Units	Fall Semester
3	Math 1520 Calculus II [Math 1510] ⁵ (<i>Math 132</i>)
3	Phys 1740 or 1760 Physics I [Math 1520] ⁶ (<i>Phys 191 or 193</i>)
1	Phys 1741 Physics I Lab (<i>Phys 191L</i>)
4	ESE 1050 Intro to Electrical and Systems Engineering (<i>ESE 105</i>)
3	CSE 1301 Intro to Computer Science (<i>CSE 131</i>)
14	Semester Total

Units	Spring Semester
3	Math 2130 Calculus III [Math 1520] ⁵ (<i>Math 233</i>)
3	Phys 1742 or 1680 Physics II [Math 1520, Phys 1740 or 1760] ⁵ (<i>Phys 192 or 194</i>)
1	Phys 1743 Physics II Lab (<i>Phys 192L</i>)
3	ESE 2050 Intro to Engineering Design [ESE 1050, CSE 1301] ⁵ (<i>ESE 205</i>)
3	ESE 2170 Differential Equations and Dynamical Systems Modeling in Engineering [ESE 1050] ⁵ (<i>ESE 217</i>)
3	H&SS Elective ²
16	Semester Total

SECOND YEAR

Units	Fall Semester
3	ESE 2180 Linear Algebra and Component Analysis [ESE 1050] ⁵ (<i>ESE 2180</i>)
3	H&SS Elective ²
3	Chem 1601 or 1701 Chemistry ⁷ (<i>Chem 105 or 111A</i>)
2	Chem 1751 Lab [Chem 1601 or 1701] ⁶ (<i>Chem 151</i>)
4	ESE 2300 Intro to Circuits [Phys 1742 or 1680] ⁵ [ESE 2170 or Math 2500] ⁶ (<i>ESE 230</i>)
15	Semester Total

Units	Spring Semester
3	ESE 2190 Vector Calculus and Dynamics [ESE 2180, (ESE 2170 or MATH 2500)] ⁵
3	H&SS Elective ²
3	ESE 3510 Signals and Systems ¹⁰ (<i>ESE 351</i>)
3	ESE 3260 Probability and Statistics for Engineering [Math 2130] ⁵ (<i>ESE 326</i>)
3	Outside concentration elective
15	Semester Total

THIRD YEAR

Units	Fall Semester
3	ESE 4031 Optimization for Engineered Planning, Decisions and Operations ³ or ESE 4150 Optimization [Multivariable calculus, Linear algebra] ⁵ (<i>ESE 415</i>)
3	ESE 4410 Control Systems [CSE 1301 and ESE 3510] ⁵ (<i>ESE 441</i>)
3	Systems science and engineering electives with engineering topics units ⁸
3	Outside concentration elective
3	H&SS Elective ²
15	Semester Total

Units	Spring Semester
3	Required systems lab ⁴
3	Engr 3100 Technical Writing [Junior] ⁶ (<i>Engr 310</i>)
6	Systems science and engineering electives with engineering topics units ⁸
3	H&SS Elective ²
15	Semester Total

FOURTH YEAR

Units	Fall Semester
3	ESE 4971 Systems Science and Engineering Capstone Design Project (<i>ESE 499</i>)
3	H&SS Elective ²
1	Engr 4501 Engineering Ethics and Sustainability
3	Systems science and engineering electives with engineering topics units ⁸
3	Outside concentration elective
3	Elective systems lab ⁹
16	Semester Total

Units	Spring Semester
3	Outside concentration elective
11	Free electives
14	Semester Total

Bolded courses are typically taught fall and spring semesters.

¹ A minimum of 120 units (an average course load of 15 units per semester) are required for the BSSSE degree

² A minimum of 18 units of H&SS are required

³ Prerequisites: ESE 1050 (or both CSE 1301 and Math 3300), Math 2500 and ESE 3260

⁴ ESE 4480 Control Systems Design Lab [ESE 3510]⁵ [ESE 4410]⁶ or ESE 4481 Autonomous Aerial Vehicle Control Lab [ESE 4410]⁵

⁵ Pre-requisite

⁶ Co-requisite

⁷ Chem 1701 recommended, but Chem 1601 accepted

⁸ At least 12 units of SSE electives. A total of 45 topics units required for the BSSSE degree. For more information regarding electives and topics units, visit [here](#).

⁹ Select one elective lab: ESE 3050, 4480, 4481, 4482, 449, 4650, or 4880.

¹⁰ Prerequisites: (ESE 2170 or Math 2500) and (ESE 1050 or ESE 2300)