

Tufts University – School of Engineering
Class of 2025 (requirements as established in the 2021-2022 Bulletin)
Bachelor of Science in Chemical Engineering (BSCHE)
Major Requirement

* Courses that require a letter grade (i.e., no pass/fail)

The BSCHE comprises credit requirements and course requirements as established by the School of Engineering and Department of Chemical & Biological Engineering. Students must satisfy the SOE and ABET-EAC requirements listed in the Credit Requirements box, as well as fulfill all course requirements. The School of Engineering requirements are shown in italics and fall outside second major double counting rules. SHU values listed for each course requirement reflect those associated with the corresponding Tufts course. Unless otherwise noted, course requirements may be satisfied with transfer courses having SHU values that are different than those shown here. In all cases, students should enter the SHUs received or earned in the correct SOE-Attribute column for a given course requirement to ensure they meet the credit requirements. For planning purposes, students completing the BSCHE requirements with Tufts courses will earn at least 130 SHU.

Engineering Fundamentals*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
<i>EN 1 Applications in Eng.</i>	3							
<i>ES 2 Intro. Comp. in Eng. or CS 11 Intro. Comp. Sci.</i>	4							
<i>ES 10 Intro. Materials Sci.</i>	3							
subtotal	10			-	-	-		

Mathematics*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
MATH 32 Calculus I	4							
MATH 34 Calculus II	4							
MATH 42 Calculus III	4							
MATH 51 Differential Equations	4							
subtotal	16	-	-		-	-	-	

Natural Sciences*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
CHEM 1 Chem. Fund. w/ lab or CHEM 11 General Chemistry	5-6							
CHEM 2 Chem. Principles w/ lab or CHEM 12 General Chemistry	5-6							
CHEM 31 Physical Chemistry I	4							
CHEM 33 Physical Chemistry Lab	2							
CHEM 51 Organic Chemistry I	4							
CHEM 53 Organic Chemistry I Lab	2							
PHY 11 Gen. Physics I w/ lab	5							
BIO 13 Cells & Organisms w/ lab	5							
subtotal	≥32	-	-	-		-	-	

HASS	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
<i>ENG 1* Expos. Writing or ENG 3</i>	3							
<i>Humanities Elective (a)</i>	≥3							
<i>Social Science Elective (b)</i>	≥3							
<i>≥24 SHU of SOE-HASS are required for the degree. List additional courses below (see note c).</i>								
subtotal	≥24	-	-	-	-		-	

Credit Requirements	SOE Attribute						Total
	E	C	M	NS	HASS	None	
<i>SOE Requirements</i>	≥30		≥30		≥24	-	≥120
ABET-EAC Program Requirements	≥45		≥30		-	-	-
Student Totals							

CHBE Core*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
CHBE 10 Chem. Proc. Prin.	3							
CHBE 11 Chem. Eng. Thermo.	3							
CHBE 21 Transport Phenom. I	3							
CHBE 22 Transport Phenom. II	3							
CHBE 39 Appl. Num. Methods	3							
CHBE 45 Chem. & Bio. Sep.	3							
CHBE 51 CHBE Lab	3							
CHBE 52 CHBE Lab	3							
CHBE 60 Prod. & Process Dsn.	3							
CHBE 102 Reactor Design	3							
CHBE 109 Proc. Dyn. & Control	3							
subtotal	33	-		-	-	-	-	

Program Electives*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
Chemistry Elective (d)	3-5							
Biology Elective (e)	3-5							
Math & Science Elective (f)	3-5							
CHBE Elective (g)	3							
CHBE Elective (g)	3							
subtotal	≥15	-		-		-	-	

Abbreviations:

- SHU = Semester Hour Unit
- SOE = School of Engineering
- ABET-EAC = Engineering Accreditation Commission of ABET
- C = Courses having attribute SOE-Computing
- E = Courses having attribute SOE-Engineering
- M = Courses having attribute SOE-Mathematics
- NS = Courses having attribute SOE-Natural Sciences
- HASS = Course having attribute SOE-HASS (Humanities, Arts, and Social Sciences)
- None = Course without SOE attribute

Student and Advisor Notes:

BSCHE Notes

(a) Humanities Elective

At least 3 SHU of Humanities are required. Requirement may not be satisfied with pre-matriculation credits, ENG 1, ENG 3, or a course satisfying the Social Sciences Elective (b).

Select From:

Any course having attribute SOE-HASS-Humanities

(b) Social Sciences Elective

At least 3 SHU of Social Sciences are required. Requirement may not be satisfied with pre-matriculation credits or a course satisfying the Humanities elective (a).

Select From:

Any course having attribute SOE-HASS-Social Sciences

(c) Humanities, Arts or Social Sciences Electives

Select From:

Any course having attribute SOE-HASS

Any course having attribute SOE-HASS-Humanities

Any course having attribute SOE-HASS-Arts

Any course having attribute SOE-HASS-Social Sciences

(d) Chemistry Elective

Courses selected may not be used to fulfill any other course or elective requirement.

Select From:

Chemistry: CHEM 32, CHEM 42, CHEM 52, CHEM 61, CHEM 132, CHEM 133, CHEM 135, CHEM 136, CHEM 141, CHEM 150, CHEM 151, CHEM 152, CHEM 155, CHEM 157, CHEM 161, CHEM 162, CHEM 163, CHEM 171, CHEM 172

Chemical & Biological Engineering: CHBE 121, CHBE 122, CHBE 140

(e) Biology Elective

Courses selected may not be used to fulfill any other course or elective requirement.

Select from:

Biology: BIO 14, BIO 41, BIO 46, BIO 62, BIO 104, BIO 105, BIO 106, BIO 134, BIO 152, BIO 162, BIO 163, BIO 168

Biomedical Engineering: BME 153

Chemical & Biological Engineering: CHBE 62, CHBE 162, CHBE 163, CHBE 164, CHBE 168

Chemistry: CHEM 171, CHEM 172

(f) Math & Science Elective

Courses selected may not be used to fulfill any other course or elective requirement.

Select from:

Any approved Chemistry or Chemical Engineering Elective (see note d)

Any approved Biology Elective (see note e)

Any course in PHY having attribute SOE-Natural Sciences

Mathematics: MATH 61, MATH 70, MATH 155, MATH 165, MATH 166

(g) CHBE Electives

Courses selected may not be used to fulfill any other course or elective requirement.

Only one 3 SHU credit course can be applied from CHBE 95/96.

Select from:

Any course in CHBE

BSCHE Course Selection Guidance

Fall Semester, First Year

Course	SHU	SOE Attribute
<i>EN 1 Introduction to Engineering</i>	3	Engineering
MATH 32 Calculus I	4	Mathematics
CHEM 1 Chemical Fundamentals with laboratory	5	Natural Sciences
<i>ENG 1 Expository Writing</i>	3	HASS
Semester Total SHU	15	

Spring Semester, First Year

Course	SHU	SOE Attribute
<i>ES 2 Introduction to Computing in Engineering</i> <i>or CS 11 Introduction to Computer Science</i>	4	Engineering or Computing
MATH 34 Calculus II	4	Mathematics
CHEM 2 Chemical Principles with laboratory	5	Natural Sciences
PHY 11 General Physics I with laboratory	5	Natural Sciences
Semester Total SHU	18	

Fall Semester, Second Year

Course	SHU	SOE Attribute
CHBE 10 Chemical Process Principles	3	Engineering
MATH 42 Calculus III	4	Mathematics
BIO 13 Cells & Organisms with laboratory	5	Natural Sciences
CHEM 31 Physical Chemistry I	4	Natural Sciences
CHEM 33 Physical Chemistry Laboratory	2	Natural Sciences
Semester Total SHU	18	

Spring Semester, Second Year

Course	SHU	SOE Attribute
CHBE 11 Chemical Engineering Thermodynamics	3	Engineering
CHBE 21 Transport Phenomena I	3	Engineering
ES 10 Introduction to Materials Science	3	Engineering
MATH 51 Differential Equations	4	Mathematics
<i>HASS Electives</i>	6-8	HASS
Semester Total SHU	19-21	

Fall Semester, Third Year

Course	SHU	SOE Attribute
CHBE 22 Transport Phenomena II	3	Engineering
CHBE 39 Applied Numerical Methods for CHBE	3	Engineering
CHEM 51 Organic Chemistry I	4	Natural Science
CHEM 53 Organic Chemistry I Laboratory	2	Natural Science
<i>HASS Elective</i>	3-5	varies with selection
Semester Total SHU	15-17	

Spring Semester, Third Year

Course	SHU	SOE Attribute
CHBE 45 Chemical & Biological Engineering Separations	3	Engineering
CHBE 102 Reactor Design	3	Engineering
Program Electives	6-10	varies with selection
<i>HASS Elective</i>	3-5	varies with selection
Semester Total SHU	15-21	

Fall Semester, Fourth Year

Course	SHU	SOE Attribute
CHBE 51 Chemical & Biological Engineering Laboratory	3	Engineering
CHBE 109 Process Dynamics & Control	3	Engineering
Program Electives	6-10	varies with selection
<i>HASS Elective</i>	3-5	varies with selection
Semester Total SHU	15-21	

Spring Semester, Fourth Year

Course	SHU	SOE Attribute
CHBE 52 Chemical & Biological Engineering Laboratory	3	Engineering
CHBE 60 Product & Process Design	3	Engineering
Program Elective	3-5	varies with selection
<i>HASS Electives</i>	6-10	varies with selection
Semester Total SHU	15-18	