Tufts University – School of Engineering

Class of 2025 (requirements as established in the 2021-2022 Bulletin)

Bachelor of Science in Biomedical Engineering (BSBME)

Major Requirement

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

The BSBME comprises credit requirements and course requirements as established by the School of Engineering and Department of Biomedical 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 BSBME requirements with Tufts courses will earn at least 135 SHU.

		SOE Attribute						
Mathematics & Natural Sciences*	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
MATH 32 Calculus I	4							
MATH 34 Calculus II	4							
MATH 42 Calculus III	4							
MATH 51 Differential Equations	4							
Probability & Statistics (a)	3-5							
CHEM 1 Chem. Fund. w/ lab	5							
CHEM 2 Chem. Principles w/ lab	5							
PHY 11 Gen. Physics I w/ lab	5							
PHY 12 General Physics II w/ lab 5	5							
subtotal	**≥39**	-	-			-	-	

		SOE Attribute						
Engineering & Computing Fund.*	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
EN 1 Applications in Engineering	3							
ES 2 Intro. Comp. in Eng. or CS 11 Intro. Comp. Sci	4							
subtotal	**7**			-	-	-	-	

		SOE Attribute						
Communication	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
ENG 1 Expos. Writing or ENG 3*	3							
BME 6* Scientific Reading, Writing & Presentations	3							
ES 85 Professional Preparation for Cooperative Education	1							
subtotal	**7**	-	-	-	-		-	

		SOE Attribute						
HASS Electives	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
Humanities Elective (b)	*≥3*							
Social Science Elective (c)	*≥3*							
≥24 SHU of SOE-HASS are required for the degree. List below courses that do not appear in Communication (see note d).								
subtotal	**≥17**	-	-	-	-		-	

		SOE Attribute						
Electrical Systems & Optics*	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
ES 3 Intro. Electrical Systems	5							
ES 15 Mod. Optics & Photonics	3							
subtotal	**8**	-		-	-	-	-	

		SOE Attribute						
Biomedical Engineering Core*	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
BME 11 Biomechanics	3							
BME 12 Biothermodynamics	3							
BME 33 Mol. Cell., & Prot. I	5							
BME 34 Mol. Cell., & Prot. II	5							
BME 44 Tis. Org. & Syst. I	5							
BME 45 Tis. Org. & Syst. I	5							
BME 51 Intro. Biophotonics	4							
BME 66 Eng. Dsn. Process	3							
BME 100 Dsn. Med. Instrum.	4							
BME 7 Capstone I	3							
BME 8 Capstone II	3							
subtotal	**43**	-		-		-	-	

		SOE Attribute						
Technical Electives*	**SHU**	**C**	**E**	**M**	**NS**	**HASS**	**None**	**Term**
Technical Elective (e)	3-4							
Technical Elective (e)	3-4							
Technical Elective (f)	3-4							
Technical Elective (f)	3-4							
Technical Elective (g)	1-5							
subtotal	**≥13**					-		

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

	SOE Attribute						
Credit Requirements	**E**	**C**	**M**	**NS**	**HASS**	**None**	**Total**
SOE Requirements	*≥30*		*≥30*		*≥24*	-	*≥120*
ABET-EAC Requirements	*≥45*		*≥30*		-	-	*≥120*
Student Totals							

Student and Advisor Notes:

BSBME Notes

(a) Probability & Statistics Elective
Select from:
BIO 132(4,-), BME 141(3,SoE-Math), CSHD 140/DLS 273(3,-), CEE 6/CH 36 (3,-), CEE 156(4,SoE-Math), EC 13 (4,-), EE 24(3,SoE-Math), EE 104(3,SoE-Math), ES 56(4,SoE-Math), MATH 166(4,SoE-Math), PSY 31(5,-).

(b) 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 (c).
Select From:
Any course having attribute SOE-HASS-Humanities

(c) 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 (b).
Select From:
Any course having attribute SOE-HASS-Social Sciences

(d) 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

(e) Technical Elective
Courses selected may not be used to fulfill any other course requirement.
Select any course from the following thematic groups:
Tissue Engineering and Regenerative Medicine: BIO 41(4,SoE-NatSci), BIO 46(3,SoE-NatSci), BIO 104 (3, SoE-NatSci), BIO 105 (3, SoE-NatSci), BIO 152(3,SoE-NatSci), BIO 171(4,SoE-NatSci), CHBE 102(3,SoE-Engr), CHEM 51(4,SoE-NatSci), CHEM 52(4,SoE-NatSci).

Biomaterials: BIO 46, BIO 171(4, SoE-NatSci), CHEM 31(4,SoE-NatSci), CHEM 32(3,SoE-NatSci), CHEM 51(4,SoE-NatSci), CHEM 52(4,SoE-NatSci).

Biomedical Devices and Imaging: EE 21(4,SoE-Engr), EE125(3,SoE-Engr), EE 133(3,SoE-Engr), ES 4(4,SoE-Engr), ES 55(3,SoE-Math), CS 15 (4, SoE-Comp), PHYS 31(4,SoE-NatSci).

(f) Technical elective
Courses selected may not be used to fulfill any other course requirement.
Select From:
Any BME course
Any course from the following thematic groups:
Tissue Engineering and Regenerative Medicine: BME 56(4,SoE-Engr), BME 57(3,SoE-Engr), BME 122(4,SoE-Engr), BME 143(3,SoE-Engr), BME 154(3,SoE-Engr), BME 163(3,SoE-NatSci), BME 165(3,SoE-Engr), BME 168(3,SoE-Engr), BME 169(3,SoE-Engr), BME 175(3,SoE-Engr)

Biomaterials: BME 56(4,SoE-Engr), BME 57(3,SoE-Engr), BME155(3,SoE-Engr), BME 153(3,SoE-Engr), BME 165(3,SoE-Engr), BME 168(3,SoE-Engr), BME 185(3,SoE-Engr), CHBE 121(3,SoE-Engr), CHBE 122(3,SoE-Engr), ME 123(3,SoE-Engr)

Biomedical Devices and Imaging: BME 25(3,SoE-NatSci), BME 51(4,SoE-Engr), BME 56(4,SoE-Engr), BME 57(3,SoE-Engr), BME 61(3,SoE-Engr), BME 122(3,SoE-Engr), BME 131(3,SoE-Engr), BME 149(3,-), BME155(3,SoE-Engr), BME 160(3,-), BME 161(3,SoE-Engr), BME164(3,SoE-Engr), BME 166(3,SoE-Engr), BME 180(3,SoE-Engr)

(g) Technical Elective
Courses selected may not be used to fulfill any other course requirement.
Select From:
Any BME course
Any course having attribute SOE-Engineering
Any course having attribute SOE-Mathematics
Any course having attribute SOE-Natural Sciences

BSBME Course Selection Guidance

Fall Semester, First Year

Course	SHU	SOE Attribute
EN 1 Introduction to Engineering	3	Engineering
MATH 32 Calculus I	4	Mathematics
PHY 11 General Physics I with laboratory	5	Natural Sciences
ENG 1 Expository Writing	3	HASS
Semester Total SHU	**15**	

Spring Semester, First Year

Course	SHU	SOE Attribute
ES 2 Introduction to Computing in Engineering or *CS 11 Introduction to Computer Science*	4	Engineering or Computing
MATH 34 Calculus II	4	Mathematics
PHY 12 General Physics II with laboratory or CHEM 1 Chemical Fundamentals with laboratory	5	Natural Sciences
HASS Elective	3-5	HASS
Semester Total SHU	**16-18**	

Fall Semester, Second Year

Course	SHU	SOE Attribute
MATH 42 Calculus III	4	Mathematics
CHEM 1 Chemical Fundamentals with laboratory or CHEM 2 Chemical Principles with laboratory or PHY 12 General Physics II with laboratory	5	Natural Sciences
BME 11 Biomechanics: Solids & Fluids	3	Engineering
BME 33 Biomedical Concepts at the Molecular, Protein & Cellular Scales I	5	Natural Sciences
HASS Elective	3-4	HASS
ES 85 Professional Preparation for Co-op Education	1	HASS
Semester Total SHU	**21--22**	

Spring Semester, Second Year

Course	SHU	SOE Attribute
MATH 51 Differential Equations	4	Mathematics
CHEM 2 Chemical Principles with laboratory or PHY 12 General Physics II with laboratory	5	Natural Sciences
BME 34 Biomedical Concepts at the Molecular, Protein & Cellular Scales II	5	Natural Sciences
BME 44 Biomedical Concepts at the Tissue, Organ & System Scales I	5	Engineering
Semester Total SHU	**19**	

Fall Semester, Third Year

Course	SHU	SOE Attribute
Probability & Statistics (a)	3-5	varies with selection
ES 3 Introduction to Electrical Systems with laboratory	5	Engineering
ES15 Modern Optics & Photonics	3	Engineering
BME 66 Engineering Design Process	3	Engineering
BME 45 Biomedical Concepts at the Tissue, Organ & System Scales II	5	Engineering
Semester Total SHU	**19-21**	

Spring Semester, Third Year

Course	SHU	SOE Attribute
HASS Elective	3-5	HASS
BME 12 Biothermodynamics	3	Engineering
BME 100 Design of Medical Instrumentation	4	Engineering
BME 51 Intro to Biophotonics	4	Engineering
BME 6 Scientific Reading, Writing & Presentations	3	HASS
Semester Total SHU	**17-19**	

Fall Semester, Fourth Year

Course	SHU	SOE Attribute
HASS Elective	3-5	HASS
Technical Elective (e)	3-4	varies with selection
Technical Elective (e)	3-4	varies with selection
Technical Elective (f)	3-4	varies with selection
BME 7 Capstone I	3	Engineering
Semester Total SHU	**15-20**	

Spring Semester, Fourth Year

Course	SHU	SOE Attribute
HASS Elective	3-5	HASS
HASS Elective	3-4	HASS
Technical Elective (f)	3-4	varies with selection
Technical Elective (g)	1-5	varies with selection
BME 8 Capstone II	3	
Semester Total SHU	**13-21**	