

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

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

The BSDS comprises credit requirements and course requirements as established by the School of Engineering and Department of Computer Science. Students must satisfy the SOE 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 BSDS requirements with Tufts courses will earn at least 120 SHU.

Mathematics & Natural Sciences*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
MATH 32 Calculus I	4							
MATH 34 Calculus II or MATH 39 Honors Calculus I-II	4							
MATH 42 Calculus III or MATH 44 Honors Calculus III	4							
MATH 65 Foundations of higher mathematics.	3							
MATH 70 Linear Algebra or MATH 72 Abstract Linear Alg.	3							
Probability Elective (a)	3-4							
MATH 166 Statistics	3							
BIO-CHEM-PHY elective(b)	5							
BIO-CHEM-PHY elective (b)	5							
BIO-CHEM-PHY Depth Elective (c)	5							
NS Elective (d)	≥3							
<b>subtotal</b>	<b>≥42</b>	-	-			-	-	

HASS	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
ENG 1* Expos. Writing or ENG 3	3							
Humanities Elective (e)	≥3							
Social Science Elective (f)	≥3							
Ethics & Social Context Elec. (g)	3-4							
≥24 SHU of SOE-HASS are required for the degree. List below HASS courses that do not appear in the Breadth Elective Section (see note h).								
<b>subtotal</b>	<b>≥15</b>	-	-	-	-		-	

Credit Requirements	SOE Attribute						Total
	E	C	M	NS	HASS	None	
SOE Requirements	≥30		≥30		≥24	-	≥120
<b>Student Totals</b>							

**Abbreviations:**

- SHU = Semester Hour Unit
- SOE = School of Engineering
- 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:**

Engineering*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
EN 1 Applications in Eng.	3							
ES 2 Intro. Computing in Eng. or ENG-CS Elective (i)	≥3							
<b>subtotal</b>	<b>≥6</b>			-	-	-	-	

Data Science Core*	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
CS 11 Intro. Comp. Sci.	4							
CS 15 Data Structures	4							
CS 30 Programming for Data Science OR CS 40 Machine Structure & Assembly-Language Prog.	4-5							
CS 135 Intro Machine Learning & Data Mining	3							
CS 136 Stat. Pat. Recog. or MATH 126 Num. Lin. Alg.	3-4							
CS 160 Algorithms	4							
DS Infrast. & Systems Elec. (j)	≥3							
Data Anal. Interfaces Elec. (k)	≥3							
Comp & Theor. Asp. Elec. (l)	≥3							
DS Elective (m)	≥3							
DS 97 Sr. Capstone Proj. I	3							
DS 98 Sr. Capstone Proj. II	3							
<b>Subtotal</b>	<b>≥40</b>			-	-	-	-	

Breadth Electives	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
≥9 SHU of Breadth Electives are required for the degree. List courses below (see note n).								
<b>subtotal</b>	<b>≥9</b>							

Additional Courses	SHU	SOE Attribute						Term
		C	E	M	NS	HASS	None	
List below additional courses needed to satisfy the credit requirements.								
<b>subtotal</b>	<b>≥0</b>							

## BSDS Notes

- (a) Probability  
Select From  
EE 24, EE104, or Math 165
- (b) Biology, Chemistry or Physics Elective  
Select From  
BIO 13, CHEM 1, or PHY 11 (lab mandatory)
- (c) Biology, Chemistry, or Physics Depth Elective  
Select From  
BIO 14, CHEM 2, or PHY 12 (lab mandatory)
- (d) Natural Sciences Elective  
Select From  
Courses having attribute SOE-Natural Sciences
- (e) 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 (e).  
Select From  
Courses having attribute SOE-HASS-Humanities
- (f) 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 (d).  
Select From  
Courses having attribute SOE-HASS-Social Sciences
- (g) Ethics & Social Context Elective  
Select From  
PHIL 24 or EM 54
- (h) 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
- (i) Engineering or Computing Elective  
Course selected may not be used to fulfill any other course requirement.  
Select any course of 3 SHU or more from:  
Any course having attribute SOE-Computing  
Any course having attribute SOE-Engineering
- (j) Data Science Infrastructure and Systems Elective  
Course selected may not be used to fulfill any other course requirement.  
Select from:  
CS 51, CS 111, CS 112, CS 115, CS 116, CS 117, CS 118, CS 119, CS 120, or CS 151
- (k) Data Analysis Interfaces Elective  
Course selected may not be used to fulfill any other course requirement.  
Select from:  
CS 52, CS 136, CS 137, CS 138, CS 141, CS 142, CS 171, CS 175, CS 177, CS 178, CS 152, or DS 143
- (l) Computational and Theoretical Aspects Elective  
Course selected may not be used to fulfill any other course requirement.  
Select From:  
CS 131, CS 160, MATH 123, MATH 125, MATH 126, EE 109, EE 127, EE 130, EE 133, EE 140, DS/CS 53, or DS/CS 153
- (m) DS Elective  
Courses selected may not be used to fulfill any other course requirement.  
Select from:  
Any course listed under Data Science Infrastructure and Systems Elective (i)  
Any course listed under Data Analysis Interfaces Elective (j)  
Any course listed under Computational and Theoretical Aspects Elective (k)  
Additionally approved courses:  
MATH 51, MATH 63, MATH 87, MATH 133, MATH 153, MATH 155, MATH 156, CEE 187, ME 150, DS/CS 93, DS/CS 193, CS 94, CS 191, DS/CS 193, CS 194, DS/CS 195, CS 197, EE 93, EE 94, EE 95, EE 96, EE 191, EE 192, EE 197.
- (n) Disciplinary Breadth  
Courses selected for this category may not be used to fulfill any other course requirement.  
9 SHUs of courses chosen from the following options:  
Courses in one social science, with attribute SOE-HASS-Social-Sciences  
Courses in one natural science, with attribute SOE-Natural-Sciences  
Three courses in Civil and Environmental Engineering (CEE)  
Three courses in Classics (CLS)  
Students may petition to replace these options with a coherent program of at least 9 SHUs. Petitions must list all course to be taken but may be multi-disciplinary.

## BSDS Course Selection Guidance

### Fall Semester, First Year

Course	SHU	SOE Attribute
<i>EN 1 Introduction to Engineering</i>	3	Engineering
MATH 32 Calculus I (or MATH 39)	4	Mathematics
Biology, Chemistry, or Physics Elective	5	Natural Sciences
<i>ENG 1 Expository Writing</i>	3	HASS

Semester Total SHU 15

### Spring Semester, First Year

Course	SHU	SOE Attribute
<i>CS 11 Intro. Computer Science</i>	4	Computing
MATH 34 Calculus II	4	Mathematics
Biology, Chemistry, or Physics Elective	5	Natural Sciences
NS Elective	3-5	Natural Sciences

Semester Total SHU 16-18

### Fall Semester, Second Year

Course	SHU	SOE Attribute
CS 15 Data Structures	4	Computing
MATH 42 Calculus III (or MATH 44)	4	Mathematics
MATH 65 Foundations of higher mathematics	3	Mathematics
Biology, Chemistry, or Physics Depth Elective	5	Natural Sciences
<i>HASS Elective</i>	3-5	HASS

Semester Total SHU 19-21

### Spring Semester, Second Year

Course	SHU	SOE Attribute
CS 40 Machine Structure & Assembly-Language Prog.	5	Computing
MATH 70 Linear Algebra (or MATH 72)	3	Mathematics
Ethics & Social Context Elective	3-4	HASS
Data Science Elective	3-5	Computing
<i>HASS Elective</i>	3-5	HASS

Semester Total SHU 17-21

### Fall Semester, Third Year

Course	SHU	SOE Attribute
CS 135 Intro Machine Learning & Data Mining	3	Computing
Data Science Elective	3-4	varies with selection
Probability Elective (EE 104)	3-4	Mathematics
Disciplinary Breadth	3-5	varies with selection
<i>HASS Elective</i>	3-5	HASS

Semester Total SHU 15-21

### Spring Semester, Third Year

Course	SHU	SOE Attribute
CS 160 Algorithms	4	Computing
MATH 166 Statistics	3	Mathematics
Data Science Elective	3-4	varies with selection
Disciplinary Breadth	3-5	varies with selection
<i>HASS Electives</i>	6-10	HASS

Semester Total SHU 19-26

### Fall Semester, Fourth Year

Course	SHU	SOE Attribute
DS 97 Senior Capstone Project I	3	Computing
Data Science Electives	6-8	varies with selection
Disciplinary Breadth	3-5	varies with selection
<i>HASS Elective</i>	3-5	HASS

Semester Total SHU 15-21

### Spring Semester, Fourth Year

Course	SHU	SOE Attribute
DS 98 Senior Capstone Project II	3	Computing
CS 136 Statistical Pattern Recognition (Or MATH 126)	3	Computing
Data Science Elective	3-4	varies with selection
<i>HASS Electives</i>	6-10	HASS

Semester Total SHU 15-20