

# The Minor in Biomedical Data Science

The minor in Biomedical Data Science is designed to integrate data science principles — preparing, transforming, modeling, visualizing, validating, and communicating data — with the unique challenges and considerations of medicine and health care. The curriculum encompasses the following: (1) fundamental mathematics concepts such as linear algebra, probability, statistics, and computer modeling; (2) the specialized data science education necessary to practically approach the particular challenges of genomic data, sensor data, and health care data; and (3) the ethical considerations of privacy, equity, and access unique to medical data sharing and analysis.

A minor in Biomedical Data Science requires the completion of 18 units selected from the following courses. McKelvey Engineering students of all disciplines as well as students majoring in biology, physics, neuroscience, or other sciences are ideal candidates for this minor. All courses must be taken with a credit option to qualify for the minor.

## Curriculum

**Core Biomedical Engineering Courses** (required; all must be completed):

Code	Title	Units
BME 231	Foundations of Biomedical Computing (Spring/Summer; No prerequisite; First offering SP22)	3
BME 4015	Biomedical Data Science Capstone Design	3
BME 440	Biomedical Data Science (Fall; Prerequisite: BME 231; First offering FL22)	3

**Mathematics Course** (students must complete one from the following list):

Code	Title	Units
ESE 318	Engineering Mathematics A (Fall/Spring; Prerequisites: Math 233 and Math 217 or equivalent)	3
Math 309	Matrix Algebra (Fall/Spring; Prerequisite: Math 131)	3
MEMS 201	Numerical Methods and Matrix Algebra (Spring; Prerequisite: Math 217)	3

**Probability and Statistics Course** (students must complete one from the following list):

Code	Title	Units
ESE 326	Probability and Statistics for Engineering (Fall/Spring; Prerequisite: Math 233 or equivalent)	3
Engr 328	Engineering Statistics with Probability	3
SDS 2200	Elementary Probability and Statistics	3
SDS 3200	Elementary to Intermediate Statistics and Data Analysis	3

**Biomedical Engineering Upper Level Elective** (students must complete one from the following list):

Code	Title	Units
BME 470	Mathematics of Imaging Science (Fall; Prerequisite: Consent of instructor)	3
BME 472	Biological Neural Computation (Spring; Prerequisite: Consent of instructor)	3
BME 519	Advanced Cognitive, Computational, and Systems Neuroscience (Spring; Prerequisite: Consent of instructor)	3
BME 533	Biomedical Signal Processing (Spring; Prerequisite: Consent of instructor)	3

Additional courses may be added to these lists as new courses are developed. Questions about the Biomedical Data Science minor can be addressed to Professor Patricia Widder (pwidder9876@wustl.edu).