

B.S. in Biomedical Engineering

BME Tracks:

Medical Device and Imaging Track

(120 credits)

First Year

1st Semester		Credits
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

BME 101	Introduction to Biomedical Engineering	0
MATH 112	Calculus II	4
CHEM 126	General Chemistry II	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		14

Second Year

1st Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 111	Introduction to Physiology	3
BME 301	Electrical Fundamentals of Biomedical Engineering	3
BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		17

2nd Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
Term Credits		16

Third Year

1st Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 382	Engineering Models of Physiological Systems	3
MATH 337	Linear Algebra	3
BME 386	Biosensor and Data Acquisition Lab	3

BME 333	Biomedical Signals and Systems	3
Term Credits		15
2nd Semester		
Engineering Elective ³		3
BME 383	Measurement Lab for Physiological Systems and Tissue	3
BME 372	Electronics of Medical Devices	3
IE 492	Engineering Management	3
Engineering Elective ³		3
Term Credits		15
Fourth Year		
1st Semester		
BME 495	Capstone Design I	2
Engineering Elective ³		3
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3
BME 471	Principles of Medical Imaging	3
Term Credits		14
2nd Semester		
BME 496	Capstone Design 2	3
Capstone HSS 4xx		3
BME 472	FDA Regulation of Medical Devices	3
Science or Engineering Elective ^{3,4}		3
Term Credits		12
Total Credits		120

- ¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).
- ² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).
- ³ Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- ⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – MEDICAL DEVICE & IMAGING CO-OP TRACK – CYCLE A

First Year

		Credits
1st Semester		
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17
2nd Semester		
BME 101	Introduction to Biomedical Engineering	0
MATH 112	Calculus II	4
CHEM 126	General Chemistry II	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1

ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		14
Second Year		
1st Semester		
History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 111	Introduction to Physiology	3
BME 301	Electrical Fundamentals of Biomedical Engineering	3
BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		17
2nd Semester		
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
ENGR 211	Professional Skills for Engineers I	1
Term Credits		17
Third Year		
1st Semester		
ENGR 310	Co-op Work Experience I	12
Term Credits		12
2nd Semester		
MATH 337	Linear Algebra	3
BME 372	Electronics of Medical Devices	3
BME 382	Engineering Models of Physiological Systems	3
BME 386	Biosensor and Data Acquisition Lab	3
History and Humanities GER 300 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		15
Fourth Year		
1st Semester		
ENGR 410	Co-op Work Experience II	12
Term Credits		12
2nd Semester		
BME 333	Biomedical Signals and Systems	3
BME 383	Measurement Lab for Physiological Systems and Tissue	3
Engineering Elective ³		3
Engineering Elective ³		3
IE 492	Engineering Management	3
Term Credits		15
Fifth Year		
1st Semester		
BME 495	Capstone Design I	2
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3
Engineering Elective ³		3
BME 471	Principles of Medical Imaging	3
Term Credits		14

2nd Semester

BME 496	Capstone Design 2	3
Capstone HSS 4xx		3
BME 472	FDA Regulation of Medical Devices	3
Science and Engineering Elective ^{3,4}		3
Term Credits		12
Total Credits		145

¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).

² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – MEDICAL DEVICE & IMAGING CO-OP TRACK – CYCLE B**First Year**

1st Semester		Credits
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

BME 101	Introduction to Biomedical Engineering	0
MATH 112	Calculus II	4
CHEM 126	General Chemistry II	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
ENGL 102	English Composition: Introduction to Writing for Research	3
Term Credits		14

Second Year**1st Semester**

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 111	Introduction to Physiology	3
BME 301	Electrical Fundamentals of Biomedical Engineering	3
BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		17

2nd Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3

BME 304	Material Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
Term Credits		16
Third Year		
1st Semester		
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 382	Engineering Models of Physiological Systems	3
MATH 337	Linear Algebra	3
BME 372	Electronics of Medical Devices	3
BME 386	Biosensor and Data Acquisition Lab	3
ENGR 211	Professional Skills for Engineers I	1
Term Credits		16
2nd Semester		
ENGR 310	Co-op Work Experience I	12
Term Credits		12
Fourth Year		
1st Semester		
Engineering Elective ³		3
Engineering Elective ³		3
BME 333	Biomedical Signals and Systems	3
BME 383	Measurement Lab for Physiological Systems and Tissue	3
IE 492	Engineering Management	3
Term Credits		15
2nd Semester		
ENGR 410	Co-op Work Experience II	12
Term Credits		12
Fifth Year		
1st Semester		
BME 495	Capstone Design I	2
BME 471	Principles of Medical Imaging	3
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3
Engineering Elective ³		3
Term Credits		14
2nd Semester		
BME 496	Capstone Design 2	3
Science or Engineering Elective ^{3,4}		3
Capstone HSS 4xx		3
BME 472	FDA Regulation of Medical Devices	3
Term Credits		12
Total Credits		145

¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).

² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives choices: BME 385, BME 420, BME 422, BME 427, BME 430, BME 321, BME 351, BME 352, BME451, BME452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

Biomaterials Track

(120 credits)

First Year

1st Semester

		Credits
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year

1st Semester

BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3
BME 111	Introduction to Physiology	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		14

2nd Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
BME 301	Electrical Fundamentals of Biomedical Engineering	3
Term Credits		16

Third Year

1st Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
CHEM 243	Organic Chemistry I	3
BME 352	Thermal Science for Biomedical Engineering	3
MTEN 201	Introductory Principles of Materials Engineering	3
BME 385	Cell and Biomaterial Engineering Laborarory	3
Term Credits		15

2nd Semester

IE 492	Engineering Management	3
BME 383	Measurement Lab for Physiological Systems and Tissue	3
BME 422	Biomaterials Characterization	3
BME 420	Advanced Biomaterials Science	3

History and Humanities GER 300 (<http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/>) 3

Term Credits		15
Fourth Year		
1st Semester		
BME 430	Fundamentals of Tissue Engineering	3
BME 382	Engineering Models of Physiological Systems	3
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3
BME 495	Capstone Design I	2
Term Credits		14
2nd Semester		
BME 427	Biotransport	3
Engineering Elective ³		3
Engineering Elective ³		3
BME 496	Capstone Design 2	3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		15
Total Credits		120

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² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – BIOMATERIALS CO-OP TRACK – CYCLE A

First Year

1st Semester		Credits
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17
2nd Semester		
ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year**1st Semester**

BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3
BME 111	Introduction to Physiology	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2

Term Credits		14
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2nd Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
BME 301	Electrical Fundamentals of Biomedical Engineering	3
ENGR 211	Professional Skills for Engineers I	1

Term Credits		17
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Third Year**1st Semester**

ENGR 310	Co-op Work Experience I	12
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Term Credits		12
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2nd Semester

History and Humanities GER 300 (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 352	Thermal Science for Biomedical Engineering	3
MTEN 201	Introductory Principles of Materials Engineering	3
CHEM 243	Organic Chemistry I	3
BME 385	Cell and Biomaterial Engineering Laborarory	3

Term Credits		15
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Fourth Year**1st Semester**

ENGR 410	Co-op Work Experience II	12
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Term Credits		12
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2nd Semester

Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
BME 382	Engineering Models of Physiological Systems	3
IE 492	Engineering Management	3
BME 420	Advanced Biomaterials Science	3
BME 422	Biomaterials Characterization	3

Term Credits		15
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Fifth Year**1st Semester**

BME 495	Capstone Design I	2
BME 383	Measurement Lab for Physiological Systems and Tissue	3
BME 430	Fundamentals of Tissue Engineering	3
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3

Term Credits		14
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2nd Semester

BME 496	Capstone Design 2	3
BME 427	Biotransport	3

Engineering Elective ³	3
Engineering Elective ³	3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)	3
Term Credits	15
Total Credits	145

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³ Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – BIOMATERIALS CO-OP TRACK – CYCLE B

First Year

1st Semester		Credits
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
ENGL 101	English Composition: Introduction to Academic Writing	3
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year

1st Semester

BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3
BME 111	Introduction to Physiology	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		14

2nd Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
MATH 222	Differential Equations	4
BME 301	Electrical Fundamentals of Biomedical Engineering	3

ENGR 211	Professional Skills for Engineers I	1
Term Credits		17
Third Year		
1st Semester		
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
CHEM 243	Organic Chemistry I	3
BME 352	Thermal Science for Biomedical Engineering	3
MTEN 201	Introductory Principles of Materials Engineering	3
BME 385	Cell and Biomaterial Engineering Laboratory	3
Term Credits		15
2nd Semester		
ENGR 310	Co-op Work Experience I	12
Term Credits		12
Fourth Year		
1st Semester		
BME 382	Engineering Models of Physiological Systems	3
IE 492	Engineering Management	3
BME 420	Advanced Biomaterials Science	3
BME 422	Biomaterials Characterization	3
History and Humanities GER 300 (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		15
2nd Semester		
ENGR 410	Co-op Work Experience II	12
Term Credits		12
Fifth Year		
1st Semester		
BME 495	Capstone Design I	2
BME 383	Measurement Lab for Physiological Systems and Tissue	3
BME 430	Fundamentals of Tissue Engineering	3
Science or Engineering Elective ^{3,4}		3
Science or Engineering Elective ^{3,4}		3
Term Credits		14
2nd Semester		
BME 496	Capstone Design 2	3
BME 427	Biotransport	3
Engineering Elective ³		3
Engineering Elective ³		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		15
Total Credits		145

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² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 321, BME 351, BME 352, BME451, BME 452, MECH 236 and BME 601, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, CHE 375, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

Biomechanics Track

(120 credits)

First Year

1st Semester

		Credits
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year

1st Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 111	Introduction to Physiology	3
MATH 211	Calculus III A ¹	3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		17

2nd Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 304	Material Fundamentals of Biomedical Engineering	3
BME 301	Electrical Fundamentals of Biomedical Engineering	3
BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
MATH 222	Differential Equations	4
Term Credits		16

Third Year

1st Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 382	Engineering Models of Physiological Systems	3
BME 321	Adv Mechanics for Biomed Engr	3
MATH 337	Linear Algebra	3
MECH 236	Dynamics	2
Term Credits		14

2nd Semester

BME 351	Introduction to Biofluid Mechanics	3
BME 384	Biomechanics Laboratory	3

BME 478	Introduction to CAD for Biomechanics	4
IE 492	Engineering Management	3
Science or Engineering Elective ^{3,4}		3
Term Credits		16
Fourth Year		
1st Semester		
Science or Engineering Elective ^{3,4}		3
BME 451	Biomechanics I	3
BME 495	Capstone Design I	2
BME 383	Measurement Lab for Physiological Systems and Tissue	3
Engineering Elective ³		3
Term Credits		14
2nd Semester		
BME 452	Mechanical Behavior and Performance of Biomaterials	3
BME 496	Capstone Design 2	3
Engineering Elective ³		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		12
Total Credits		120

- ¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).
- ² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).
- ³ Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.
- ⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – BIOMECHANICS CO-OP TRACK– CYCLE A

		Credits
First Year		
1st Semester		
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17
2nd Semester		
ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year**1st Semester**

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)	3
BME 111 Introduction to Physiology	3
BME 301 Electrical Fundamentals of Biomedical Engineering	3
BME 303 Biological and Chemical Foundations of Biomedical Engineering	3
MATH 211 Calculus III A ¹	3
MATH 279 Statistics and Probability for Engineers ²	2
Term Credits	17

2nd Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)	3
BME 210 Processing Fund for Biol Signa	3
BME 302 Mechanical Fundamentals of Biomedical Engineering	3
BME 304 Material Fundamentals of Biomedical Engineering	3
MATH 222 Differential Equations	4
ENGR 211 Professional Skills for Engineers I	1
Term Credits	17

Third Year**1st Semester**

ENGR 310 Co-op Work Experience I	12
Term Credits	12

2nd Semester

MATH 337 Linear Algebra	3
MECH 236 Dynamics	2
BME 321 Adv Mechanics for Biomed Engr	3
Science or Engineering Electives ^{3,4}	3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)	3
Term Credits	14

Fourth Year**1st Semester**

ENGR 410 Co-op Work Experience II	12
Term Credits	12

2nd Semester

BME 351 Introduction to Biofluid Mechanics	3
BME 382 Engineering Models of Physiological Systems	3
BME 384 Biomechanics Laboratory	3
BME 478 Introduction to CAD for Biomechanics	4
IE 492 Engineering Management	3
Term Credits	16

Fifth Year**1st Semester**

BME 383 Measurement Lab for Physiological Systems and Tissue	3
BME 451 Biomechanics I	3
BME 495 Capstone Design I	2
Science or Engineering Elective ^{3,4}	3
Engineering Elective ³	3
Term Credits	14

2nd Semester

BME 496 Capstone Design 2	3
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BME 452	Mechanical Behavior and Performance of Biomaterials	3
Engineering Elective ³		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		12
Total Credits		145

¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).

² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

The curriculum for B.S. in Biomedical Engineering – BIOMECHANICS CO-OP TRACK – CYCLE B

First Year

1st Semester		Credits
ENGL 101	English Composition: Introduction to Academic Writing	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
CHEM 125	General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
MATH 111	Calculus I	4
FED 101	Fundamentals of Engineering Design	2
FYS SEM	First-Year Student Seminar	0
Term Credits		17

2nd Semester

ENGL 102	English Composition: Introduction to Writing for Research	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
CHEM 126	General Chemistry II	3
MATH 112	Calculus II	4
BME 101	Introduction to Biomedical Engineering	0
Term Credits		14

Second Year

1st Semester

History and Humanities GER 200 level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/)		3
BME 111	Introduction to Physiology	3
BME 301	Electrical Fundamentals of Biomedical Engineering	3
BME 303	Biological and Chemical Foundations of Biomedical Engineering	3
MATH 211	Calculus III A ¹	3
MATH 279	Statistics and Probability for Engineers ²	2
Term Credits		17

2nd Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
BME 210	Processing Fund for Biol Signa	3
BME 302	Mechanical Fundamentals of Biomedical Engineering	3
BME 304	Material Fundamentals of Biomedical Engineering	3

MATH 222	Differential Equations	4
ENGR 211	Professional Skills for Engineers I	1
Term Credits		17
Third Year		
1st Semester		
ENGR 210	Career Planning Seminar for En	1
MATH 337	Linear Algebra	3
MECH 236	Dynamics	2
BME 321	Adv Mechanics for Biomed Engr	3
Science or Engineering Elective ^{3,4}		3
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
Term Credits		15
2nd Semester		
ENGR 310	Co-op Work Experience I	12
Term Credits		12
Fourth Year		
1st Semester		
BME 351	Introduction to Biofluid Mechanics	3
BME 382	Engineering Models of Physiological Systems	3
BME 384	Biomechanics Laboratory	3
BME 478	Introduction to CAD for Biomechanics	4
IE 492	Engineering Management	3
Term Credits		16
2nd Semester		
ENGR 410	Co-op Work Experience II	12
Term Credits		12
Fifth Year		
1st Semester		
BME 383	Measurement Lab for Physiological Systems and Tissue	3
BME 451	Biomechanics I	3
BME 495	Capstone Design I	2
Science or Engineering Elective ^{3,4}		3
Engineering Elective ³		3
Term Credits		14
2nd Semester		
BME 496	Capstone Design 2	3
BME 452	Mechanical Behavior and Performance of Biomaterials	3
Engineering Elective ³		3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Term Credits		12
Total Credits		146

¹ Students can take MATH 213 (<http://catalog.njit.edu/search/?P=MATH%20213>) (Calculus III B) instead of MATH 211 (<http://catalog.njit.edu/search/?P=MATH%20211>).

² Students can take MATH 333 (<https://catalog.njit.edu/search/?P=MATH%20333>) (Probability and Statistics) instead of MATH 279 (<https://catalog.njit.edu/search/?P=MATH%20279>).

³ Engineering Electives Choices: BME 372, BME 333, BME 386, BME 471, BME 472, BME 385, BME 420, BME 422, BME 427, BME 430, ENGR 3xx4xx, BME 491, BME 492, BME 651, BME 670, BME 671, BME 673, BME 674, BME 676, BME 678, BME 688, BME 698, OPSE 301, OPSE 310, OPSE 402, MET 304, MTEN 201, BMET 415, MNET 303, MNET 315.

⁴ Science Elective Choices are: CHEM 243, CHEM 244, CHEM 473, MATH 3xx/4xx, PHYS 350, PHYS 451, IE 335, IE 355, IE 449, IE 439, IE 455, MATH 661, CS 350, IE 334, IE 335, IE 447, IE 455, IE 460, IE 463.

Pre-Health Option

Students planning to apply to Medical and Dental schools will follow one of the above tracks with specific selections and substitutions to fulfill Medical School admissions guidelines.

The following should be taken as Advanced Science Electives:

Code	Title	Credits
CHEM 473	Biochemistry	3
CHEM 244	Organic Chemistry II	3
CHEM 244A	Organic Chemistry I Laboratory	2

The following should be taken as History and Humanities GER courses:

Code	Title	Credits
STS 221	Introduction to Sociology	3
PSY 359	Foundations of Cyberpsychology	3

The following will substitute for BME 303:

Code	Title	Credits
BIOL 201 or R120 201	Found of Biol: Cell & Molecula (Lecture) Foundations Of Biology	3
BIOL 202 or R120 202	Found of Biol: Cell & Molecula (Lab) Foundations Of Biology Lab	1

General Education Requirements "Refer to the General Education Requirements for specific information for GER courses"