B.S. in Mechanical Engineering

(120 credit minimum)

First Year		
1st Semester		**Credits**
CHEM 121 or CHEM 125	Fundamentals of Chemical Principles I or General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
FED 101	Fundamentals of Engineering Design	2
CS 101	Computer Programming and Problem Solving	3
ENGL 101	English Composition: Introduction to Academic Writing	3
MATH 111	Calculus I	4
FYS SEM	First-Year Student Seminar	0
	Term Credits	**16**
2nd Semester		
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
ENGL 102	English Composition: Introduction to Writing for Research	3
MATH 112	Calculus II	4
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
	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
MATH 213	Calculus III B	4
ME 215	Engineering Materials and Processes	3
MECH 234	Engineering Mechanics	2
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
	Term Credits	**16**
2nd Semester		
MATH 222	Differential Equations	4
ME 231	Kinematics of Machinery	3
MECH 236	Dynamics	2
MECH 237	Strength Of Materials	3
PHIL 334	Engineering Ethics and Technological Practice: Philosophical Perspectives on Engineering	3
	Term Credits	**15**
Third Year		
1st Semester		
ECE 405	Electrical Engineering Principles	3
MATH 279	Statistics and Probability for Engineers	2
ME 305	Introduction to System Dynamics	3
ME 311	Thermodynamics I	3
ME 315	Stress Analysis	3
	Term Credits	**14**
2nd Semester		
ME 304	Fluid Mechanics	3
ME 312	Thermodynamics II	3
ME 316	Machine Design	3

ME 343	Mechanical Laboratory I	3
ME 430	Introduction to Computer-Aided Design	3
	Term Credits	**15**

Fourth Year

1st Semester

History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
ME 403	Mechanical Systems Design I	3
ME 405	Mechanical Laboratory II	2
ME 407	Heat Transfer	3
ME/TE	ME or Technical Elective I	3
	Term Credits	**14**

2nd Semester

ME 406	Mechanical Laboratory III	2
ME 408	Mechanical Systems Design II	2
ME/TE	ME or Technical Elective II	3
ME/TE	ME or Technical Elective III	3
Select one of the following		3
MGMT 390	Principles of Business	
IE 492	Engineering Management	
Econ [a]		
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
	Term Credits	**16**
	Total Credits	**120**

5-year B.S. in Mechanical Engineering with Co-op Option A

(145 credit minimum)

First Year

1st Semester		**Credits**
CHEM 121 or CHEM 125	Fundamentals of Chemical Principles I or General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
FED 101	Fundamentals of Engineering Design	2
CS 101	Computer Programming and Problem Solving	3
ENGL 101	English Composition: Introduction to Academic Writing	3
MATH 111	Calculus I	4
FYS SEM	First-Year Student Seminar	0
	Term Credits	**16**

2nd Semester

CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
ENGL 102	English Composition: Introduction to Writing for Research	3
MATH 112	Calculus II	4
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
	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
MATH 213	Calculus III B	4

MECH 234	Engineering Mechanics	2
ME 215	Engineering Materials and Processes	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
	Term Credits	**16**
2nd Semester		
ENGR 210	Career Planning Seminar for En	1
MATH 222	Differential Equations	4
ME 231	Kinematics of Machinery	3
MECH 236	Dynamics	2
MECH 237	Strength Of Materials	3
PHIL 334	Engineering Ethics and Technological Practice: Philosophical Perspectives on Engineering	3
	Term Credits	**16**
Summer		
CO-OP I, Co-op Work Experience I		
	Term Credits	**0**
Third Year		
1st Semester		
ENGR 310	Co-op Work Experience I	12
	Term Credits	**12**
2nd Semester		
ECE 405	Electrical Engineering Principles	3
MATH 279	Statistics and Probability for Engineers	2
ME 305	Introduction to System Dynamics	3
ME 311	Thermodynamics I	3
ME 315	Stress Analysis	3
	Term Credits	**14**
Summer		
CO-OP II, Co-op Work Experience II		
	Term Credits	**0**
Fourth Year		
1st Semester		
ENGR 410	Co-op Work Experience II	12
	Term Credits	**12**
2nd Semester		
ME 304	Fluid Mechanics	3
ME 312	Thermodynamics II	3
ME 316	Machine Design	3
ME 343	Mechanical Laboratory I	3
ME 430	Introduction to Computer-Aided Design	3
	Term Credits	**15**
Fifth Year		
1st Semester		
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
ME 403	Mechanical Systems Design I	3
ME 405	Mechanical Laboratory II	2
ME 407	Heat Transfer	3
ME/TE	ME or Technical Elective I	3
	Term Credits	**14**
2nd Semester		
ME 406	Mechanical Laboratory III	2

ME 408	Mechanical Systems Design II	2
ME/TE	ME or Technical Elective II	3
ME/TE	ME or Technical Elective III	3
Select one of the following		3
MGMT 390	Principles of Business	
IE 492	Engineering Management	
Econ [a]		
Humanities and Social Science Senior Seminar GER		3
	Term Credits	**16**
	Total Credits	**145**

5-year B.S. in Mechanical Engineering with Co-op Option B

(145 credit minimum)

First Year		
1st Semester		**Credits**
CHEM 121 or CHEM 125	Fundamentals of Chemical Principles I or General Chemistry I	3
CHEM 125A	General Chemistry Lab I	1
FED 101	Fundamentals of Engineering Design	2
CS 101	Computer Programming and Problem Solving	3
ENGL 101	English Composition: Introduction to Academic Writing	3
MATH 111	Calculus I	4
FYS SEM	First-Year Student Seminar	0
	Term Credits	**16**
2nd Semester		
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
ENGL 102	English Composition: Introduction to Writing for Research	3
MATH 112	Calculus II	4
PHYS 111	Physics I	3
PHYS 111A	Physics I Lab	1
	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
MATH 213	Calculus III B	4
MECH 234	Engineering Mechanics	2
ME 215	Engineering Materials and Processes	3
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
	Term Credits	**16**
2nd Semester		
ENGR 210	Career Planning Seminar for En	1
MATH 222	Differential Equations	4
ME 231	Kinematics of Machinery	3
MECH 236	Dynamics	2
MECH 237	Strength Of Materials	3
PHIL 334	Engineering Ethics and Technological Practice: Philosophical Perspectives on Engineering	3
	Term Credits	**16**

Third Year		
1st Semester		
ECE 405	Electrical Engineering Principles	3
MATH 279	Statistics and Probability for Engineers	2
ME 305	Introduction to System Dynamics	3
ME 311	Thermodynamics I	3
ME 315	Stress Analysis	3
	Term Credits	**14**
2nd Semester		
ENGR 310	Co-op Work Experience I	12
	Term Credits	**12**
Summer		
CO-OP I, Co-op Work Experience I		
	Term Credits	**0**
Fourth Year		
1st Semester		
ME 304	Fluid Mechanics	3
ME 312	Thermodynamics II	3
ME 316	Machine Design	3
ME 343	Mechanical Laboratory I	3
ME 430	Introduction to Computer-Aided Design	3
	Term Credits	**15**
2nd Semester		
ENGR 410	Co-op Work Experience II	12
	Term Credits	**12**
Summer		
CO-OP II, Co-op Work Experience II		
	Term Credits	**0**
Fifth Year		
1st Semester		
History and Humanities GER 300+ level (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/)		3
ME 403	Mechanical Systems Design I	3
ME 405	Mechanical Laboratory II	2
ME 407	Heat Transfer	3
ME/TE	ME or Technical Elective I	3
	Term Credits	**14**
2nd Semester		
ME 406	Mechanical Laboratory III	2
ME 408	Mechanical Systems Design II	2
ME/TE	ME or Technical Elective II	3
ME/TE	ME or Technical Elective III	3
Humanities and Social Science Senior Seminar GER (http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/)		3
Select one of the following		3
MGMT 390	Principles of Business	
IE 492	Engineering Management	
Econ [a]		
	Term Credits	**16**
	Total Credits	**145**

ME/Technical Electives-Students must select 4 course from the list below. In special cases, other ME/Technical Electives may be taken with departmental approval. BS/MS student may substitute ME 600-700 level courses with approval of the Mechanical Engineering Department.

Code	Title	Credits
CHEM 243	Organic Chemistry I [1]	
CHEM 244	Organic Chemistry II [1]	
CHEM 473	Biochemistry [1]	
ENTR 210	Introduction to Entrepreneurship	
ENTR 320	Financing New Venture	
ENTR 440	Lean Startup Accelerator [2]	
FIN 315	Fundamentals of Corporate Finance [2]	
IE 331	Applied Statistical Methods [3]	
IE 335	Engineering Cost Analysis and Control	
IE 447	Legal Aspects of Engineering	
IE 449	Industrial Robotics	
IE 453	Computer Integrated Manufacturing	
IE 455	Robotics and Programmable Logic Controllers	
IE 473	Safety Engineering	
MATH 331	Introduction to Partial Differential Equations	
MATH 333	Probability and Statistics [3, 4]	
MATH 335	Vector Analysis	
MATH 336	Applied Abstract Algebra	
MATH 337	Linear Algebra	
MATH 340	Applied Numerical Methods [5]	
MATH 371	Physiology And Medicine [5]	
MATH 372	Population Biology [5]	
ME 410	Co-op Work Experience II [6]	
MIS 363	Project Management for Managers [3]	
MRKT 330	Principles of Marketing [3]	
OM 375	Business Operations Management and Analytics [3]	
R120 101	General Biology [1]	
R120 102	General Biology II [1]	
ME 425	Finite Element Method in Mechanical Engineering	
ME 431	Introduction to Robotics and Automation	
ME 432	Principles of Air Conditioning and Refrigeration	
ME 433	Vibration Analysis	
ME 437	Structural Analysis	
ME 438	Introduction to Physical Metallurgy	
ME 439	Principles of Tribiology	
ME 441	Computer Simulation and Analysis in Mechanical Engineering	
ME 451	Introduction to Aerodynamics	
ME 452	Dynamics of Space Flight	
ME 455	Automatic Controls	
ME 470	Engineering Properties of Plastics	
ME 471	Introduction to Polymer Processing Techniques	
ME 490	Mechanical Engineering Project A [7]	
ME 491	Mechanical Engineering Project B [7]	

1 Only for those students who are Pre-Med.

2 Students cannot receive credit for both IE 331 and Math 333. Only one can be taken for degree credit.

3 Only for those students who have declared a minor in Business.

4 When Math 333 is used instead of Math 279, it cannot also be used as a ME/Technical Elective.

5 Only for those students who have declared a minor in Math.

6 Students must take ME 310 AND Me 410 to receive 3 credits for ME 410 toward the degree requirements as a ME/Technical Elective.

[7] Me 490/491 require departmental approval if used as ME/Technical electives.

a Choose one from ECON 201, ECON 265 or ECON 266.

Refer to the **General Education Requirement**s section of this catalog for further information on electives.

This curriculum represents the maximum number of credits per semester for which a student is advised to register. A full-time credit load is 12 credits. First-year students are placed in a curriculum that positions them for success which may result in additional time needed to complete curriculum requirements. Continuing students should consult with their academic advisor to determine the appropriate credit load.