

# B.S. General Engineering - Concentration in Materials Manufacturing Systems

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(120 credits)

## Concentration in Materials Manufacturing Systems

### First Year

#### 1st Semester

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

#### 2nd Semester

CHEM 126	General Chemistry II	3
ENGL 102	English Composition: Introduction to Writing for Research	3
MATH 112	Calculus II	4
PHYS 121	Physics II	3
PHYS 121A	Physics II Lab	1
MTEN 101	Introduction to Materials Engineering	1
<b>Term Credits</b>		<b>15</b>

### Second Year

#### 1st Semester

MATH 211	Calculus III A	3
History and Humanities GER 200 level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-200-level/</a> )		3
MTEN 201	Introductory Principles of Materials Engineering	3
MECH 234	Engineering Mechanics	2
ENGR Elective (200 Level)		1
ENGR Elective (200 Level)		1
<b>Term Credits</b>		<b>13</b>

#### 2nd Semester

MATH 222	Differential Equations	4
MTEN 205	Mechanical Behavior of Materials	4
ENGR 211	Professional Skills for Engineers I	1
CS 115 or CS 106	Introduction to Computer Science I in C++ <sup>1</sup> or Introduction to Computing	3
ENGR Elective (200 Level)		1
<b>Term Credits</b>		<b>13</b>

### Third Year

#### 1st Semester

MTEN 301	Thermodynamics of Materials	3
ENGR 320	Prototyping Essentials	3
MTEN 305	Materials Characterization Methods	4
COM 313	Technical Writing	3
IE 331	Applied Statistical Methods	3
<b>Term Credits</b>		<b>16</b>

**2nd Semester**

ENGR 360	Geometric Dimensioning and Tolerancing and Applied Metrology	3
Social Science GER ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger/">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/social-science-ger/</a> )		3
ENGR 301	Engineering Applications of Data Science	3
History and Humanities GER 300+ level ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/ger-300-level/</a> )		3
IE 335	Engineering Cost Analysis and Control	3
<b>Term Credits</b>		<b>15</b>

**Fourth Year****1st Semester**

IE 461	Product Quality Assurance	3
MTEN 309	Electronic, Optical, Magnetic and Thermal Properties of Materials	4
ECE 405	Electrical Engineering Principles	3
ENGR 430	Engineering for Quality and Reliability	3
IE 455	Robotics and Programmable Logic Controllers <sup>2</sup>	3
<b>Term Credits</b>		<b>16</b>

**2nd Semester**

IE 459	Supply Chain and Production Planning	3
ENGR 400	Multidisciplinary Engineering Design Project	3
Humanities and Social Science Senior Seminar GER ( <a href="http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/">http://catalog.njit.edu/undergraduate/academic-policies-procedures/general-education-requirements/hss-capstone/</a> )		3
IE 492	Engineering Management	3
ENGR 350	Intellectual Property for Engineers	3
<b>Term Credits</b>		<b>15</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> Students interested in Chemical, Materials Engineering should take CS 115

<sup>2</sup> One of the following courses can substitute-  
IE 447 Legal Aspects of Engineering  
ENGR 424 Robotics Science Fundamentals