

# M.S. in Materials Science and Engineering

The program is offered in two options, the Materials Engineering Option and the Materials Science Option. These programs are administered by NCE (Newark College of Engineering) and CSLA (College of Science and Liberal Arts) colleges, respectively. A joint committee comprised of NCE and CSLA faculty oversee the program.

## Materials Engineering Option

Administered by the Chemical and Materials Engineering Department, NCE

The master's degree is a valued professional credential, offered on a full-time or part-time basis. Applicants are expected to have a baccalaureate degree in engineering (chemical, mechanical, electrical, civil, or biomedical) or in physics or chemistry or equivalent with a minimum GPA of 3.0. Students with undergraduate degrees in biology or other STEM disciplines may also be admitted on condition that additional bridge courses may be required. International students must achieve a TOEFL score of at least 550 (paper-based); 213 (computer-based); 79 (internet-based). A quantitative section of GRE must be at the level approved by NCE.

Thirty credit hours are required for the degree. A thesis is optional.

### Core courses (12 credit hours)

Any cross-listed courses will not be offered simultaneously.

Code	Title	Credits
<b>Core Courses</b>		
MTEN 610 or MTSE 601	Found of Materials Sci & Engr Fundamentals of Engineering Materials	3
MTEN 611 or MTSE 655	Diffusion & Solid State Kineti Diffusion and Solid State Kinetics	3
MTEN 612 or MTSE 602	Thermodynamics of Materials Thermodynamics of Materials	3
MTEN 613	Characterization of Materials	3

### Elective Courses and MS Thesis (18 credit hours: six courses, or four courses and thesis)

Substitutions must be approved by advisor.

Code	Title	Credits
BME 651	Principles of Tissue Engineering	3
BME 672	Biomaterials	3
BME 680	BioMEMS Design and Applications	3
CE 632	Prestressed Concrete Design	3
CE 636	Mechanics and Stability of Structures	3
CE 641	Engineering Properties of Soils	3
CHE 619	Nano-scale Characterization of Materials	3
CHE 632	Visual Communication with Chemical & Materials Engineering Data	3
CHE 654	Corrosion	3
CHE 683 or ME 679	Polymer Processing Polymer Processing Techniques	3
CHE 684	Materials and Process Selection for Polymer Product Design	3
CHE 702	Selected Topics in Chemical Engineering II	3
CHE 709	Adv Separation Processes	3
CHE 710	Adv Membrane Separation Proc	3
CHE 714	Micromechanics of Part Tech Pr	3
CHE 722	Additive Manufacturing & Appl	3
CHE 750	Environmental Catalysis	3
CHE 756	Industrial Catalysis	3
CHE 775	Molecular Simulations in CHE	3

CHE 781	Polymerization-Principles and Practice	3
CHE 782	Polymer Structures and Properties	3
ECE 626	Optoelectronics - Nonlinear Modulators for Optical Communication	3
ECE 657	Semiconductor Devices	3
ECE 659	Fabrication Principles of Electronic and Optoelectronic Devices	3
ME 620	Mechanics of Materials	3
ME 621	Advanced Mechanics of Material	3
ME 626	Fatigue Fracture of Solids	3
ME 675	Mechanics of Fiber Composites	3
ME 678	Engineering Design of Plastic Products	3
ME 714	Principles of Particulate Multiphase Flows	3
MTEN 631	Data Science for Chemical and Materials Engineers	3
MTEN 633	Machine Learning for Chemical and Materials Engineers	3
MTEN 711	Nanocomposite Materials	3
MTEN 712	Nanomaterials	3
or CHEM 748	Nanomaterials	
MTEN 700B	Master's Project	3
MTEN 701B	Masters Thesis	3
MTSE 610	Mechanical Properties of Materials	3
MTSE 681	Composite Materials	3
MTSE 722	Science and Technology of Thin Films	3