

Materials Science and Engineering

Five-year Bachelor of Science / Master of Science

- Brown undergraduates in engineering and other quantitative concentrations may apply to enter an integrated program leading to a master of science degree completed in two semesters following the completion of their bachelor of science (Sc.B.) degree. The program requirements are identical to those of the regular Sc.M. degree programs, with the exception that 5th Year students are able to share up to two relevant 1000- or 2000-level Engineering courses between their bachelor's and master's programs. The maximum number of courses that can be transferred from the undergraduate program is two.

Master of Science (Thesis Option)

- Candidates must complete a coherent plan of study based in engineering or engineering science consisting of eight graduate or advanced level courses and an acceptable thesis, which is normally sponsored by a member of the engineering faculty.
- The program must include ENGN 2010 and ENGN 2020 (Mathematical Methods in Engineering and Physics) or their equivalent (must be 2000-level)
- ENGN 2010 and/or ENGN 2020 can be replaced by an alternate/ applied mathematics course or 2000-level engineering/science course. This substitution can only be made with the approval of the appropriate Graduate Representative and the Director of Graduate Studies. The final program must contain at least one advanced (2000-level) mathematics/applied mathematics course.
- Two advanced engineering courses recommended to be:
 - ENGN 2410 Thermodynamics of Materials or ENGN 1410 Physical Chemistry of Solids
 - ENGN 2420 Kinetic Processes and Mechanisms in Materials Science or ENGN 1420 Kinetics Processes in Materials Science and Engineering
- Two advanced engineering or science electives. Some recommended courses include:
 - ENGN 2430 Deformation Behavior of Materials or ENGN 1440 Mechanical Properties of Materials or ENGN 2490A Crystal Structures and Crystallography
 - ENGN 2210 Continuum Mechanics or ENGN 2240 Linear Elasticity
 - ENGN 2400 Electron Microscopy in Materials Science
 - ENGN 2930 Atomistic Modeling of Materials
 - ENGN 2460 Electronic and Magnetic Materials Design
 - ENGN 2920H Materials and Interfaces for Energy Storage Devices
- Two thesis preparation courses (ENGN 2980 Special Projects: Reading, Research, Design).
- Students should choose courses in consultation with the student's advisor to develop a coherent program. The proposed program of study must be approved by the Director of Graduate Programs in the School of Engineering.

For students in a Master of Science in Materials Science and Engineering program (Thesis Option), the approved course sequence is 2-2-2-2, where the student takes two courses in each semester. However, the program strongly recommends a sequence of 3-2-2-1 where the student takes 3 courses the first semester, 2 the second, 2 the third, and 1 the fourth.

Deviations from these schedules can result in additional tuition.

PHYS 2020	Mathematical Methods of Engineers and Physicists	1
or ENGN 2010	Mathematical Methods in Engineering and Physics I	

ENGN 2020	Mathematical Methods in Engineering and Physics II	1
Two additional 2000-level Engineering courses (other than ENGN 2980)		2
Three additional Engineering or approved science courses (not more than two 1000-level courses)		3
ENGN 2980	Special Projects, Reading, Research and Design	1

Total Credits 8

Master of Science (Non-Thesis Option)

- Candidates must complete a coherent plan of study based in engineering or engineering science consisting of eight graduate or advanced level courses.
- The program must include ENGN 2010 and ENGN 2020 (Mathematical Methods in Engineering and Physics) or their equivalent (must be 2000-level)
- ENGN 2010 and/or ENGN 2020 can be replaced by an alternate/ applied mathematics course or 2000-level engineering/science course. This substitution can only be made with the approval of the appropriate Graduate Representative and the Director of Graduate Studies. The final program must contain at least one advanced (2000-level) mathematics/applied mathematics course.
- Five advanced engineering courses recommended to be:
 - ENGN 2410 Thermodynamics of Materials or ENGN 1410 Physical Chemistry of Solids
 - ENGN 2420 Kinetic Processes and Mechanisms in Materials Science or ENGN 1420 Kinetics Processes in Materials Science and Engineering
 - ENGN 2490A Crystal Structures and Crystallography
 - ENGN 2430 Deformation Behavior of Materials or ENGN 1440 Mechanical Properties of Materials
 - ENGN 2460: Electronic and Magnetic Materials Design or ENGN 2400 Electron Microscopy in Materials Science or ENGN 2930 Atomistic Modeling of Materials or ENGN 2920H: Materials and Interfaces for Energy Storage Devices
- One advanced engineering or science electives.
- Students should choose courses in consultation with the student's advisor to develop a coherent program. The proposed program of study must be approved by the Director of Graduate Programs in the School of Engineering.

For students in the Materials Science and Engineering program (Non-Thesis Option), the approved course sequence is 3-3-2, meaning the student takes 3 courses the first semester, 3 the second, and 2 the third.

Any deviation from this schedule can result in additional tuition and/or penalties.

Note: Students enrolled in the Ph.D. program, including first-year fellowship students, should understand that an application to receive a non-thesis Sc.M. in engineering must be approved by the student's research advisor.

PHYS 2020	Mathematical Methods of Engineers and Physicists	1
or ENGN 2010	Mathematical Methods in Engineering and Physics I	
ENGN 2020	Mathematical Methods in Engineering and Physics II	1
Two additional 2000-level Engineering courses (other than ENGN2980)		2
Four additional Engineering or approved science courses (not more than three 1000-level courses)		4

Total Credits 8