

Chemical 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.
- A three-course core in Chemical Engineering is taken which includes thermodynamics (ENGN 2730 or CHEM 2010), kinetics (ENGN 2750), and transport (typically ENGN 2760, ENGN 2911P, or ENGN 2810).
- The final three courses are electives or can be used for thesis preparation (ENGN 2980 Special Projects: Reading, Research, Design). Students should choose courses in consultation with the student's advisor to develop a coherent program. At least five of the eight courses must be at the 2000-level; up to three 1000-level courses may be taken where appropriate.
- 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 Chemical 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.

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| 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 |
| CHEM 2010 | Advanced Thermodynamics | 1 |
| or ENGN 2730 | Chemical and Environmental Thermodynamics | |
| ENGN 2750 | Chemical Kinetics and Reactor Engineering | 1 |
| ENGN 2760 | Heat and Mass Transfer | 1 |
| or ENGN 2911P | Fate and Transport of Environmental Contaminants | |
| or ENGN 2810 | Fluid Mechanics I | |
| Three additional Engineering courses (At least five of the eight courses must be at the 2000-level; up to three 1000-level courses may be taken where appropriate.) | | 3 |

or ENGN 2980

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.
- A three-course core in Chemical Engineering is taken which includes thermodynamics (ENGN 2730 or CHEM 2010), kinetics (ENGN 2750), and transport (typically ENGN 2760, ENGN 2911P, or ENGN 2810).
- The final three courses are electives at least one at the 2000-level. Students should choose courses in consultation with the student's advisor to develop a coherent program. At least five of the eight courses must be at the 2000-level; up to three 1000-level courses may be taken where appropriate.
- The proposed program of study must be approved by the Director of Graduate Programs in the School of Engineering.

For students in the Master of Science in Chemical 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.

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| 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 |
| CHEM 2010 | Advanced Thermodynamics | 1 |
| or ENGN 2730 | Chemical and Environmental Thermodynamics | |
| ENGN 2750 | Chemical Kinetics and Reactor Engineering | 1 |
| ENGN 2760 | Heat and Mass Transfer | 1 |
| or ENGN 2911P | Fate and Transport of Environmental Contaminants | |
| or ENGN 2810 | Fluid Mechanics I | |
| Three additional ENGN courses (other than ENGN2980. At least five of the eight courses must be at the 2000-level; up to three 1000-level courses may be taken where appropriate.) | | 3 |
| Total Credits | | 8 |