

The MS without thesis program can typically be completed in 3 quarters.

### Course Requirements

- 2 BME systems physiology courses
- 1 statistics course
- 1 quantitative sciences and engineering course
- 7 additional engineering, science, or math courses - at least 5 must be engineering courses
- Other courses
- seminar courses (three quarters, zero credit – do not count towards the twelve (12) units of courses, but required)

The departmental requirements for the degree of Master of Science are as follows:

1. **Course Requirements Completion of at least twelve 300- or 400-level graduate courses for a letter grade** (i.e. P/N courses are not accepted), but no more than two units of BME 499 research credit; only 1 unit of 499 may be taken for credit in one term. These courses must include a core curriculum of
  - i. **BME Systems Physiology Courses** At least two of the following courses: BME 401, 402, 403. Previous credit can be established for these courses by filing a petition approved by the Chair of the Graduate Program Committee, but if so, they must be replaced with other courses approved by their adviser.
  - ii. **Statistics Course** Typical content includes: Probability distributions; testing for normality; t-tests; F-tests; non-parametric tests; power analysis and regression analysis. Note that students should review course syllabi to avoid repeating courses similar to those taken at another institution. Previous credit can be established by filing a petition approved by the Chair of the Graduate Program Committee, but if so, it must be replaced with an Engineering, Science, and Mathematics Course (see iv)
    - Choose from: STAT 330-1; IEMS 303.
  - iii. **Quantitative Sciences and Engineering Course** One must be from the list of [Quantitative Sciences and Engineering Courses](#).
  - iv. **Additional Engineering, Science, or Math Courses** 7 additional engineering, science, or math courses must be taken, of which at least 5 must be engineering courses. Two of the engineering courses may be BME 499 research credits.
  - v. **Other Courses** Students are allowed to take one or more courses oriented towards business, global health, law, etc., with permission from the Graduate Program Chair.  
For those students that do not have an adequate mathematics background (ordinary differential equations; multivariable and vector calculus; linear algebra), additional courses may be required at the discretion of the MS Program Chair.

- vi. **Seminar Courses** All students are required to complete three quarters of BMD\_ENG 512.
  - vii. **Responsible Conduct of Research (RCR) training** All incoming BME graduate students are required to complete Responsible Conduct of Research (RCR) training. For Master's students, this consists of the online CITI training only.
  - viii. The above requirements may be satisfied, upon petition to the faculty, by substitution of other appropriate classes at Northwestern that provide competency similar to that provided by the required classes.
2. **Project Requirement** A student can satisfy The Graduate School requirement for a comprehensive final exam in one of two ways:
    - i. completion of a project (a minimum of one BMD\_ENG 499) that includes a written report (length 25 pages or more) approved by a faculty member in the BME department, or
    - ii. completion of three [classes with significant project components](#) from a list provided in September of each year.
  3. **Plan of Study** Students are required to submit a plan of study in [GSTS \(Graduate Student Tracking System\)](#), consistent with the above guidelines, prior to beginning the second quarter of enrollment. This plan must be approved by the MS Program Chair. Note that this is just an initial plan; appropriate changes can be made with approval of the MS Program Chair. Failure to submit the plan on time or to follow the approved plan may lead to a delay in graduation.
  4. **Typical Timeline** - students typically enroll in 4 courses per quarter. Enrollment in 3-4 courses is considered full-time and the cost of these is included in the full-time tuition. Courses in excess of four will incur an additional fee.