

# ENGINEERING SCIENCES AND APPLIED MATHEMATICS MS

## Degree Requirements

The following requirements are in addition to, or further elaborate upon, those requirements outlined in The Graduate School Policy Guide (<https://catalogs.northwestern.edu/tgs/academic-policies-procedures/>).

### Master's

**Total Units Required: 12**

**(An overall grade average of B or better is required for the courses listed below.)**

Course	Title
ES_APPM 411-1 or ES_APPM 311-1	Differential Equations of Mathematical Physics Methods of Applied Mathematics
ES_APPM 411-2 or ES_APPM 311-2	Differential Equations of Mathematical Physics Methods of Applied Mathematics
ES_APPM 420-1	Asymptotic and Perturbation Methods in Applied Mathematics
ES_APPM 446-1	Numerical Solution of Partial Differential Equations
ES_APPM 448-0	Numerical Methods for Random Processes
ES_APPM 444-0 or ES_APPM 445-0	High Performance Scientific Computing Iterative Methods for Elliptic Equations
Mathematical Modeling Electives (approved; 3 units)	
Mathematical Content Electives (approved; 3 units)	

### Other MS Degree Requirements

- **Mathematical Content Electives Theme:** Courses selected to complete the Mathematical Content Electives must be mathematics courses related by a defined theme chosen by the student.
- **Mathematical Modeling Electives Theme:** Courses selected to complete the Mathematical Modeling Electives must be application areas that use mathematical methods and be related by a defined theme chosen by the student.
- **Master's Thesis (optional):** Up to two units of the Mathematical Modeling Electives Theme may be replaced with ES\_APPM 590-0 Research for work culminating in a Master's thesis consisting of original research and approved by a thesis committee.