

ENGINEERING SCIENCES AND APPLIED MATHEMATICS PHD

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/>).

PhD

Total Units Required: 13

Course	Title
ES_APPM 405-1	Statistics and Data Science
ES_APPM 414-0	Differential Equations of Mathematical Physics
ES_APPM 420-1	Asymptotic and Perturbation Methods in Applied Mathematics
ES_APPM 446-1	Numerical Solution of Partial Differential Equations
ES_APPM 499-0	Projects (2 units)
GEN_ENG 519-0	Responsible Conduct for Research Training
Electives (approved; 7 units) *	

*Up to 3 units may be taken outside of ES_APPM

Other PhD Degree Requirements

- **Examinations:** written preliminary examinations in differential equations, advanced calculus, complex variables and linear algebra; oral qualifying examination for admission to candidacy
- **English Language Proficiency:** meet The Graduate School's spoken English proficiency requirement (<https://www.tgs.northwestern.edu/funding/assistantships/graduate-and-teaching.html>) to be a teaching assistant (<https://catalogs.northwestern.edu/tgs/academic-policies-procedures/teaching/>)
- **PhD Dissertation:** original research, defended before student's doctoral committee
- **Final Evaluations:** oral presentation and faculty evaluation when all other requirements complete