APPLIED MATHEMATICS DEGREE

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/archives/2019-2020/undergraduate/requirements-policies/undergraduate-registration-requirement/) and the degree requirements of their home school.

**Course Requirements (48 units)**

**Core Courses (32 units)**


2. **4 engineering analysis and computer proficiency courses** (https://catalogs.northwestern.edu/archives/2019-2020/undergraduate/engineering-applied-science/#requirementstext)

3. **4 units of basic science:**
   - PHYSICS 135-2 & PHYSICS 135-3 General Physics and General Physics
   - 2 units chosen from McCormick-approved basic science courses

4. **3 design and communication courses** (https://catalogs.northwestern.edu/archives/2019-2020/undergraduate/engineering-applied-science/#requirementstext)

5. **5 basic engineering courses:**
   - COMP_SCI 230-0 Programming for Engineers
   - or COMP_SCI 211-0 Fundamentals of Computer Programming II

6. **4 courses from at least three of the following areas:**
   - Computer architecture and numerical methods
   - Electrical science
   - Fluids and solids
   - Materials science and engineering
   - Systems engineering and analysis


**Major Program (16 units)**

9. **7 engineering sciences and applied mathematics courses:**
   - ES_APPM 311-1 Methods of Applied Mathematics
   - & ES_APPM 311-2 and Methods of Applied Mathematics
   - ES_APPM 312-0 Complex Variables
   - or MATH 325-0 Complex Analysis
   - ES_APPM 322-0 Applied Dynamical Systems
   - ES_APPM 346-0 Modeling and Computation in Science & Engineering
   - MATH 334-0 Linear Algebra: Second Course
   - ES_APPM 421-1 Models in Applied Mathematics

10. **2 courses chosen from:**
    - ELEC_ENG 302-0 Probabilistic Systems
    - IEMS 202-0 Probability
    - IEMS 303-0 Statistics
    - IEMS 310-0 Operations Research
    - IEMS 313-0 Foundations of Optimization
    - MATH 310-1 Probability and Stochastic Processes
    - MATH 310-2 Probability and Stochastic Processes
    - MATH 310-3 Probability and Stochastic Processes

11. **1 mathematical modeling course chosen from:**
    - ES_APPM 399-0 Projects

**Selected Topics in Applied Mathematics (subject to department approval)**

- Other modeling course subject to department approval
- 4 courses in engineering or the sciences at the 300 level or higher leading to an approved concentration in one of the following areas:
  - Engineering
  - Mathematical social sciences (e.g., economics)
  - Mathematics (e.g., discrete mathematics or analysis)
  - Numerics
  - The sciences

- 2 technical electives at the 300 level or higher in engineering, science, or mathematics

2. Maximum of 3 basic science units may come from any one area
3. PHYSICS 140-2 Fundamentals of Physics may substitute for PHYSICS 135-2 General Physics. PHYSICS 140-3 Fundamentals of Physics may substitute for PHYSICS 135-3 General Physics. Associated labs are PHYSICS 136-2 General Physics Laboratory and PHYSICS 136-3 General Physics Laboratory.