## Ph.D. Materials Science and Engineering

### Undergraduate Preparation
- Four year degree in physical sciences or engineering

### Total credit hours
- Ninety (90) hours of graduate credit, including at least 33 hours of coursework and at least 30 hours of thesis credit

### Residency requirement
- Two years of full-time registration

### Transfer Credit
- Up to 15 credit hours of relevant graduate work, subject to approval by the Graduate Program Director

### Course Work
At least 33 credit hours of course work, including
- CEMS 501 – Solid State Physics (3 credits)
- CEMS 502 – Quantum Physics (3 credits)
- CEMS 503 – Thermodynamics of Materials (3 credits)
- CEMS 504 – Kinetics and Non-equilibrium Processes in Materials (3 credits)
- CEMS 505 – Defects and Defect-related Processes (3 credits)
- CEMS 506 – Advanced Engineering Math (3 credits)
- CEMS 545 – Characterization in Materials Science and Engineering (3 credits)
- Graduate-level technical electives (12 credits)
- ENGR 690 – Graduate seminar (0 credits) each semester of full-time enrollment

### Thesis Credits
At least 33 credit hours of thesis, including
- ENGR 660 – Research seminar (1 credit), preferably taken during the first semester of graduate enrollment
- CEMS 680 – Thesis research (32 credits)

### Progress Reports
- One-page progress report summarizing thesis progress and plans for upcoming semester

### Qualifying Exam
- Three-hour written exam covering undergraduate-level materials science and engineering
- Successful oral defense of written research proposal

*Two attempts allowed. Typically completed within first year of admission.

### Written Thesis and Oral Defense
- Written thesis meeting approval of thesis advisory committee
- Successful oral defense of thesis

### Length of Study
- Designed to be completed in 4.5 years of full-time study after admission with bachelor’s degree or in 3 years of full-time study after admission with a master’s degree.