

# Materials Science and Engineering, MS

ESMATEMS

## Program description

### Degree awarded: MS Materials Science and Engineering

The MS program in materials science and engineering stresses a sound foundation in technical fundamentals, communication and professionalism. To this end, a broad-based curriculum is offered in thermodynamics, structures and mechanical properties; kinetics; optical and magnetic properties; materials characterization; and energy production and storage.

## At a glance

- **College/School:** [Ira A. Fulton Schools of Engineering](#)
- **Location:** [Tempe](#) or [Online](#)

## Accelerated program options

This program allows students to obtain both a bachelor's and master's degree in as little as five years. It is offered as an **accelerated bachelor's plus master's degree** with:

[Chemical Engineering, BSE](#)

[Chemistry, BS](#)

[Materials Science and Engineering, BSE](#)

[Mechanical Engineering, BSE](#)

[Mechanical Engineering \(Computational Mechanics\), BSE](#)

[Mechanical Engineering \(Energy and Environment\), BSE](#)

[Physics, BS](#)

Acceptance to the graduate program requires a separate application. Students typically receive approval to pursue the accelerated master's during the junior year of their bachelor's degree program. Interested students can learn about eligibility requirements and [how to apply](#).

## Degree requirements

30 credit hours and a thesis, or

30 credit hours including a portfolio, or

30 credit hours including the required applied project course (MSE 593)

### Required Core (6 credit hours)

MSE 503 Concepts in Materials Science (3)

MSE 523 Structural and Mechanical Properties of Materials (3)

MSE 524 Advanced Thermodynamics (3)

MSE 525 Fundamentals of Electrical, Optical, and Magnetic Materials and Device Applications (3)

MSE 550 Advanced Materials Characterization (3)

MSE 560 Nanomaterials in Energy Production and Storage (3)

MSE 561 Phase Transformations, Kinetics and Diffusion in Solids (3)

### Technical Electives (18 or 24 credit hours)

### Culminating Experience (0-6 credit hours)

MSE 593 Applied Project (3) or

MSE 599 Thesis (6) or

portfolio (0)

### Additional Curriculum Information

The materials science and engineering MS program has two options: thesis and nonthesis.

All students are admitted to the nonthesis option, which requires a portfolio. During the last semester of their program, students in this option submit a portfolio that contains at least two projects from previous materials science and engineering coursework, along with a paper explaining the projects. Students must successfully complete the portfolio requirements to pass the culminating experience. Students who complete a portfolio must also take an extra six credit hours of elective coursework to reach the required 30 credit hours for the program.

Students in the applied project option write a written report in consultation with their faculty chair and present it at the end-of-semester poster symposium.

If students wish to change to the thesis option, a faculty advisor must be secured, and then a petition may be submitted to request the change to the thesis option. Students in the thesis option must complete a thesis and pass the thesis defense examination.

## Admission requirements

Applicants must fulfill the requirements of both the Graduate College and the Ira A. Fulton Schools of Engineering.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in any field from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program or a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

Admission to the materials science and engineering graduate program is highly competitive. All applicants must submit:

1. graduate admission application and application fee
2. official transcripts from all institutions attended
3. personal statement
4. resume or curriculum vitae
5. three letters of recommendation
6. proof of English proficiency

### Additional Application Information

An applicant whose native language is not English must provide proof of English proficiency regardless of their current residency. Applicants whose native language is not English must achieve a minimum score of 90 on the internet-based TOEFL.

Admission to the accelerated master's degree program requires a 3.50 ASU GPA (scale is 4.00 = "A") in degree-applicable courses. All applications are subject to review, and admission is not guaranteed.

## Tuition information

When it comes to paying for higher education, everyone's situation is different. Students can learn about [ASU tuition and financial aid](#) options to find out which will work best for them.

## Attend online

### ASU Online

ASU offers this program in an online format with multiple enrollment sessions throughout the year. Applicants may [view the program's ASU Online page](#) for program descriptions and to request more information.

## Application deadlines

**Fall**

**Spring**

[expand](#)

[expand](#)

## Career opportunities

The program prepares engineers for doctoral study or for industrial positions that specialize in research, project management and product innovation in materials science and engineering.

Professionals with a materials science and engineering master's degree have strong opportunities at all levels in material design, selection, synthesis and characterization for a wide variety of applications, including electro-optical-magnetic systems, environmental systems, energy conversion and storage, manufacturing and construction. Materials jobs are available at many high-tech and manufacturing companies of all sizes, as well as national laboratories (Department of Energy, Department of Defense, NASA) and universities. Analytical skills learned in materials engineering are also valued for other nonengineering positions.

Career examples include:

- engineer
- engineering manager or director
- engineering professor
- research engineer

## Contact information

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