

Mathematical Concepts of Engineering, **Cel**

LAMACECERT

Are you intellectually curious and eager to expand your knowledge of engineering? You'll enjoy this program's integrated approach, which offers a deeper look at how math and engineering intersect and inform each other.

Description

The certificate program in mathematical concepts of engineering is designed for students who seek a strong foundation in mathematics to support their studies in engineering. Combining a core foundation in the quantitative and analytical skills found in mathematics with related skills in engineering, the program provides students with a solid mathematical background well-suited for multiple career paths.

At a glance

- **College/School:** [The College of Liberal Arts and Sciences](#)
- **Location:** [Tempe](#) or [Online](#)

Program requirements

[2024 - 2025 Certificate Map](#)

[Certificate Map \(Archives\)](#)

The mathematical concepts of engineering certificate requires a minimum of 21 credit hours. At least 12 credit hours must be completed in upper-division coursework and at least nine credit hours must be completed at ASU. MAT 343 and STP 420 must be completed in courses offered by The College of Liberal Arts and Sciences. A grade of "C" (2.00 on a 4.00 scale) or higher is required for each course used to fulfill a certificate requirement.

Required Courses -- 18 credit hours

[IEE 380: Probability and Statistics for Engineering Problem Solving \(QTRS OR CS\)](#) (3)

[MAT 266: Calculus for Engineers II \(MATH OR MA\) \(3\)](#)
[MAT 267: Calculus for Engineers III \(MATH OR MA\) \(3\)](#)
[MAT 275: Modern Differential Equations \(MATH OR MA\) \(3\)](#)
[MAT 343: Applied Linear Algebra \(3\)](#)
[STP 420: Introductory Applied Statistics \(QTRS OR CS\) \(3\)](#)

Electives (choose one) -- 3 credit hours

[DAT 301: Exploring Data in R and Python \(4\)](#)
[IEE 381: Lean Six Sigma Methodology \(3\)](#)
[IEE 385: Engineering Statistics: Probability \(3\)](#)
[IEE 470: Stochastic Operations Research \(3\)](#)

Prerequisite courses may be needed in order to complete the requirements of this certificate.

Enrollment requirements

ASU degree-seeking students

Students must have completed MAT 265 or MAT 270 with a "C" or higher before enrolling in the certificate program. Students also must be in good academic standing, with a minimum cumulative grade point average of 2.00.

Nondegree-seeking students

Applicants with or without a bachelor's degree are eligible to apply for, and receive, this certificate through the [Pathways for the Future program](#). Applicants must have completed MAT 265 or MAT 270 with a "C" grade or higher (scale is 4.00 = "A"). Applicants who have taken these courses at another institution should use the [Transfer Guide course search](#) to determine if a transfer course can fulfill the prerequisite course requirements. Applicants who already hold a bachelor's degree should apply to ASU and this certificate program as a nondegree-seeking graduate student.

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.

Program learning outcomes

Program learning outcomes identify what a student will learn or be able to do upon completion of their program. This program has the following program outcomes:

- Implement simulation algorithms in differential equations and linear algebra with engineering and physics applications.
- Develop teamwork and communication skills, which they will apply to real world problems involving concepts from probability and statistics.

Career opportunities

The certificate in mathematical concepts of engineering is a specialization that complements a major program of study. Students with this enhanced math background can become more marketable to employers.

Contact information

[Schedule an advisor appointment](#)

[School of Mathematical and Statistical Sciences](#) | WXL R 216

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