



# Master of Software Engineering

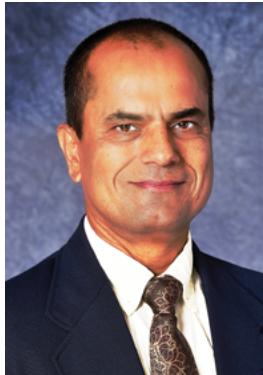


**PennState**  
World Campus

A world of possibilities.  
Online.

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“Penn State’s highly ranked graduate program in software engineering is designed for practitioners, offering a unique blend of advanced technical knowledge and leadership skills. What sets us apart is our innovative approach to learning, featuring skill-based stackable certificates that cater to the dynamic needs of the industry. These certificates not only enhance your expertise in specific areas of software engineering but also pave the way for a seamless progression into leadership roles.”

— **Dr. Raghu Sangwan**  
**Director of Engineering Programs**  
**Associate Chief Academic Officer**  
**Professor-in-Charge, Software Engineering**

# Earn a Penn State Master of Software Engineering — Online

This online software engineering master's program helps you prepare to create large-scale software products and services for industry and government through software analysis, architecture, design, development, and testing. You'll study project management, elicitation of requirements, system analysis and repair, pattern-oriented architecture and design, agile software construction, and more.

## Benefit from cohort-based learning

From start to finish, you'll progress through the program with others in your cohort. You'll gain valuable experience interfacing, collaborating, and networking with peers and faculty while completing projects remotely, just as teams do in the broader global marketplace.

## Earn stackable credentials on the way to your degree

In this program, you can earn three valuable graduate certificates to recognize your new skills and knowledge while you work toward your master's degree — without any additional course work, course fees, or application fees. Stackable credentials are a great way to gain new skills and enhance your résumé while working toward a master's degree. To reach the 36

credits required to earn the Master of Software Engineering, you'll work on:

- Graduate Certificate in Software Architecture and Design (9 credits)
- Graduate Certificate in Project Quality Management (9 credits)
- Graduate Certificate in AI Engineering (12 credits) **OR** Graduate Certificate in Data Analytics and Engineering (12 credits)
- Capstone experience (6 credits)

## Software engineering curriculum

Your learning will focus on requirements engineering, software systems architecture and design, software construction and testing, mobile and cloud computing, technical project management, and more. You'll also benefit from recent curriculum updates, including cutting-edge courses in mobile and cloud computing, artificial intelligence, machine learning, and big data.

Your capstone project will give you the opportunity to immerse yourself in the complete software development life cycle, engineering a fully functional product following an iterative incremental developmental methodology with change management, continuous integration, continuous delivery, and automated testing.

## Learning outcomes

As a successful graduate of this program, you will be prepared to:

- › demonstrate mastery of concepts and methods for modeling, designing, developing, and testing software solutions
- › critically and creatively manage the development of software-intensive systems using project management methods and tools
- › effectively communicate software ideas within an organization, to other practicing professionals, and to the public

## Career opportunities

You can use the knowledge gained from this online program and the support of Penn State career resources to pursue software engineering positions in a variety of fields. The following roles are often held by people with this type of degree:

- › software development director
- › software program or project manager
- › solutions architect
- › test architect
- › software development engineer
- › machine learning engineer
- › data engineer
- › software quality assurance (SQA) engineer



# Graduate Certificate in Project Quality Management

This 9-credit certificate program can prepare you for a career in requirements engineering, test engineering and architecture, and project management. You'll cover testing infrastructure, frameworks, and tools; automated testing; continuous integration; and project planning in the following courses:

- › Software Project Management
- › Requirements Engineering
- › Software Testing

# Graduate Certificate in Software Architecture and Design

This 9-credit certificate can equip you with the skills and knowledge needed to create large-scale, software-intensive systems. You can learn to analyze, design, implement, and manage the technical development aspects of complex software systems in the following courses:

- › Software Systems Architecture
- › Software Construction
- › Software System Design

# Graduate Certificate in AI Engineering

This 12-credit program focuses on AI and machine learning engineering and programming. You can learn to design, build, and maintain machine learning and natural language processing models while taking the following courses:

- › Deep Learning
- › Foundations of Artificial Intelligence
- › Analytics Programming in Python
- › Natural Language Processing

# Graduate Certificate in Data Analytics and Engineering

This 12-credit certificate focuses on data architecture, helping you learn to design and build the complex infrastructure required for managing and analyzing large volumes of data. You'll study programming, data modeling and design, data integration, and data warehousing in the following courses:

- › Large-Scale Database and Warehouse
- › Analytics Programming in Python
- › Foundations of Predictive Analytics
- › Data Mining

These engineering graduate certificates can be earned on their own and also used as a stackable credential that applies toward the Master of Software Engineering.

For more details and the most up-to-date information on courses, please visit:

**[worldcampus.psu.edu/SWENG](http://worldcampus.psu.edu/SWENG)**

# Why Penn State World Campus?

Penn State World Campus is an industry leader in online education, delivering more than 175 undergraduate and graduate degrees and certificates. Our mission is to provide a Penn State education to anyone, anytime — focusing on quality, convenience, and flexibility, while delivering high-quality degrees and certificates online.

## A reputation of excellence

Putting a Penn State degree or certificate on your résumé is a great way to broaden your career options and prove to employers that you are a well-educated professional.

## Flexibility and convenience

Penn State knows that adults need flexible and convenient learning options in order to continue meeting their professional and personal commitments. You can study when and where you please, earning your credential at your own pace.

## Student support services

As a Penn State World Campus student, you will be supported by a team of knowledgeable and caring staff who understand the unique challenges of balancing work and personal responsibilities while learning online. You will have access to traditional student support services, such as 24/7 technical support, career services, and a dedicated student affairs team, along with access to the University Libraries system and the opportunity to join clubs and organizations.

## Military and veteran students

We have aligned our online programs, student support services, policies, and procedures to support military personnel, veterans, and military family members.



# Begin Your Application Today

When applying to the master's degree or certificate programs, you must include the following:

## Degree

- › application form (completed and submitted online)
- › copy of official transcript from each undergraduate and graduate institution attended
- › 2 references
- › résumé
- › statement of intent
- › TOEFL or IELTS score, if applicable

## Certificates

- › application form (completed and submitted online)
- › copy of official transcript from each undergraduate and graduate institution attended
- › TOEFL or IELTS score, if applicable



For the most up-to-date information about these application materials and to apply, visit: [worldcampus.psu.edu/admissions/how-to-apply](http://worldcampus.psu.edu/admissions/how-to-apply)

## Did You Know?

- › Penn State World Campus is consistently ranked as a top provider of online education by *U.S. News & World Report*.
- › Penn State credits and degrees earned online are identical to those earned on campus.
- › Penn State World Campus has enrolled students from all 50 states and all seven continents.
- › Our online courses involve frequent interactions among students and faculty.

# Contact Us

## Admissions Questions

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Phone: 814-863-5386

[worldcampus.psu.edu/admissions](http://worldcampus.psu.edu/admissions)

## Program Questions

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