Microcertificate in AI and Machine Learning

Under Review | Fall 2026

Proposal Information

Workflow Status

In Progress

Graduate Council Agenda Preparation, Graduate College Curriculum expand

Waiting for Approval | Graduate Council Agenda Preparation

Amanda Morales-Calderon
Lisa Anderson
Amy Glasscock
Sophia Mcgovern
Kayla Durazo

Proposal to Establish a New Program

Requested Term & Year (The first term for which applications will be accepted and students admitted.)

Fall 2026

This proposal can also be viewed at:
https://asu.kuali.co/cm/#/programs/view/67991823da01fb6506e2e74c

General Information

Select Program Level and Type
Graduate certificate

General Program Information

College/School/Institute
Ira A. Fulton Schools of Engineering (CES)

Department/Division/School
Computer Science and Engineering Program (CCOMPENG)

Name of Program
Microcertificate in - AI and Machine Learning | Review

Program

AI and Machine Learning

Degree Type

Certificate (CERT)

Proposing Faculty Group
Computer Science and Engineering

Responsible Faculty Member or Director
Baoxin Li

Campus or Location options
Tempe

Add a Different Campus or Location
No

Are you requesting an online offering?
Yes

Complete the Request for Digital Immersion Implementation.

Program Description/Justification

This microcertificate provides a comprehensive introduction to artificial intelligence (AI) through both theoretical foundations and practical applications. Students engage in a combination of lectures and collaborative, project-based learning to develop a deep understanding of core AI and machine learning concepts. The curriculum covers statistical machine learning, supervised and unsupervised learning, knowledge representation and reasoning, and advanced topics in deep learning, equipping learners with the tools to design and implement intelligent systems.

Upon completion of the program, graduates will be equipped to advance their careers in AI and machine learning by applying cutting-edge techniques and tools. They will be able to identify opportunities to integrate AI solutions within their current

professional roles, strengthen the mathematical foundations essential for AI applications, and develop expertise in training and optimizing deep neural networks for complex tasks. Participants will gain a thorough understanding of machine learning paradigms and approaches for creating autonomous agents, while also learning to collaborate effectively on projects from conception through deployment.
This certificate positions professionals to contribute meaningfully to one of the fastest-growing fields in technology, opening pathways to roles in AI development, data science, and intelligent systems design.

Program Need

The School of Computing and Augmented Intelligence is leveraging the new graduate microcertificate credential offered through the Graduate College to formalize and elevate our existing online professional certifications. These microcertificates respond to a critical need in the marketplace: accessible, graduate-level programs that enable professionals to upskill quickly and strengthen their resumes without committing to a full degree. By offering rigorous yet flexible pathways into high-demand computing fields, we advance ASU's mission of broad access to quality education.

Admission criteria will be intentionally inclusive to ensure that learners from diverse backgrounds can participate, supporting workforce development and lifelong learning. Both FSE and EdPlus strongly support this initiative, recognizing that official microcertificates will be significantly more marketable than our current professional certifications. EdPlus is prepared to launch targeted marketing campaigns to meet growing demand.
This approach also addresses recent enrollment challenges in master's programs caused by economic and political factors, providing an alternative entry point for learners and a new opportunity for immersion students to earn a recognized credential. Once approved, these microcertificates will replace our existing professional certifications, positioning ASU as a leader in innovative, stackable graduate education.

The US Bureau of Labor Statistics states, "Workers in many computer-related occupations use AI daily. Programming is one of many work activities in which new LLMs and GenAI are well suited to augment worker efforts and increase productivity.12 Software developers can use GenAI to develop, test, and document code; improve data quality; and build user stories that articulate how a software feature will provide value.13 The effects of AI proliferation on this occupation are highly uncertain. On the one hand, AI is well-suited for the occupation's tasks; on the other hand, increased productivity from the use of AI may lower prices and increase demand for software products, thus boosting employment demand for software developers. In addition, AI itself may lead to increased demand for software developers, who may be needed to develop AI-based business solutions and maintain AI systems. Thus, despite its exposure to GenAI applications, this occupation is unlikely to experience a decline in employment, because robust software needs are expected to support continued demand for its workers."

This program is designed for technical professionals seeking to specialize in artificial intelligence and machine learning, as well as career changers who already possess a strong technical background. It also serves graduate students and researchers looking to deepen their expertise, along with industry professionals working in data-driven fields such as finance, healthcare, and technology. Additionally, aspiring AI leaders and innovators will find this microcertificate an excellent opportunity to build advanced skills and position themselves for leadership roles in emerging technologies.

Graduates of this program will be prepared for high-demand roles such as Machine Learning Engineer, AI Engineer, Data Scientist, Deep Learning Specialist, Natural Language Processing (NLP) Engineer, and Business Intelligence Analyst. These careers span multiple industries and offer significant opportunities for advancement in one of the fastest-growing areas of technology.

Specialized Accreditation

None.

State Authorization and Professional Licensure:

State Authorization and Professional Licensure:

Does this degree program include learning placement opportunities (clinical, externship, internship, research, student teaching, etc.)?
N

Will this degree program be offered via distance education (whole or in-part)?
N

Will in-person instruction be occurring in any jurisdiction, other than the State of Arizona?
N

Does this degree program potentially lead to professional licensure or certification (attorney, nurse, physician, teacher, etc.) for the student?
N

Collaborating Units

Are two or more academic units collaborating on this program?
No

Is this an officially recognized joint program?
No

Collaboration and Impact

List other academic units or programs that might be impacted by the proposed program and describe the potential impact (e.g., how the implementation of this program might affect student headcount/enrollment, student recruitment, faculty participation, course content, etc. in other programs) and how the programs might complement each other. If there are no comparable programs, describe why the program is unique at ASU.
SCAI's graduate microcertificate in AI and Machine Learning stands out for its highly technical curriculum, which requires a STEM foundation or strong mathematical background paired with analytical problem-solving skills. Unlike other microcertificates that focus on broader or less technical competencies, this program is designed for learners who are prepared to engage with advanced machine learning concepts and methodologies. Other academic units have acknowledged that our microcertificate serves a different audience—those seeking rigorous, engineering-driven coursework that builds deep technical expertise rather than general professional skills. This distinction ensures that the program attracts candidates who are ready to excel in complex, high-demand computing roles.

Attach a PDF copy of the letter of collaboration and impact from each Dean, or Dean's designee at the Assistant or Associate Dean level, from impacted programs and units consulted.
- FROM_HIDA_Microcertificate in AI and Machine Learning Statement of Support Request.pdf

Course Development

Will a new course subject be required for this program?
No

Will new courses be established?
No

Graduate Degree Curriculum

Is the proposed certificate a microcertificate of 9 credit hours?
Yes

Allow 400-level courses?
No

Minimum Credits Required for the Program
9

Curriculum Requirement Option 1
9 credit hours

Add another option?
No

Curriculum Requirement Option 1

Min credits required for this option

9 credit hours

Primary Requirement (Culminating experience)

Not Required

Additional Requirement(s)

Curriculum option course requirements

Required Core

9
Total Credits

- Complete all of the following
  - Select three of the following courses. Courses should be selected in consultation with your program advisor.
  - Complete 9 credits from the following courses:
    - CSE571 - Artificial Intelligence (3)
    - CSE579 - Knowledge Representation and Reasoning (3)
    - CSE575 - Statistical Machine Learning (3)

Grand Total Credits: 9

Additional Curriculum Information

Complete three courses with a cumulative GPA of at least 3.00 after the first attempt.

Sharing of Credit Hours with a Degree

Will this proposed certificate program allow sharing of credit hours from another ASU degree program to be used as part of this certificate program?

Yes, students in this microcertificate can share credit hours with another FSE graduate program. It is at the discretion of each individual program to allow the sharing of credit hours.

Projected Enrollment

Enrollment Headcounts

	Number of Students Majoring
1st Year	15
2nd Year (Yr 1 continuing + new entering)	20
3rd Year (Yr 1 & 2 continuing + new entering)	25
4th Year (Yrs 1, 2, 3 continuing + new entering)	30
5th Year (Yrs 1, 2, 3, 4 continuing + new entering)	35

Additional Enrollment Information

Estimated Timeframe to Complete Program

What is the minimum timeframe that this program can be completed?

1-2 years

If necessary, please provide additional information.
The majority of our students are online part time learners, so we would like to provide them the extra time to complete their microcertificate if necessary.

Resources (Faculty, Staff and Others)

Current Faculty

Name	Title	Highest Degree Obtained	Area of Specialization or Expertise	Estimated Level of Involvement
Yu Zhang	Associate Professor	PhD	Computer Science	Low
Kookjin Lee	Assistant Professor	PhD	Computer Science	Low
Samira Ghayekhloo	Assistant Teaching Professor	PhD	Computer Science	High
Ali Altunkaya	Assistant Teaching Professor	Masters	Computer Science	High
Bharatesh Chakravarthi	Assistant Teaching Professor	PhD	Computer Graphics and Virtual Reality	Medium
Yingzhen Yang	Assistant Professor	PhD	Computer Science	Medium

New Faculty
None

Is your college in the process of reviewing the new faculty? Or has new faculty already been approved?
No

Administration of the Program
Our SCAI Graduate Admissions team will manage the application process. The SCAI scheduling team will manage the course offerings, though all courses are already regularly being offered as part of the MCS Online program and the MS CS program and our current "professional certification" program as well. Our current staff will be able to handle the workload.

We do not yet have a lead faculty for the program. So for now it will fall under our CS Graduate Program Chair, Dr. Aviral Shrivastava.

Required Resources
None.

Resource Acquisition
These courses are already regularly offered.

Graduate Program Admission Requirements

The below sections are for initial admission criteria setup for new programs. Once the program is approved, this section will display the admission text as it appears in the academic catalog/degree search.

Applicants must fulfill the requirements of both the Graduate College and the **[name of college]**. Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in **[subject area]** or related 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 a student's first bachelor's degree program, or applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

Name of College

Ira A. Fulton Schools of Engineering (CES)

Subject Area(s)

Computing or STEM Background

Is the minimum required cumulative GPA in the last 60 hours of bachelor's degree higher than the standard minimum of 3.00?

No

Is the minimum required cumulative GPA in an applicable master's degree program higher than the standard minimum of 3.00?

No

Applicants are required to submit:

- graduate admissions application and application fee
- official transcripts
- proof of English proficiency

Select additional requirements:

Additional Application Requirements/Materials

An applicant whose native language is not English must provide proof of English proficiency regardless of current residency. If applicable, list any English proficiency requirements that are supplementary to the Graduate College requirement.

If any required components require further explanation, explain here.

Additional Admission Information:

Graduate Application Information

Indicate the first term and year in which applications will be opened for admission. Applications will be accepted on a rolling basis after that time. The regular session is only available for summer.
Note: It is the academic unit's responsibility to display program deadline dates on their website.

Campus or Location	Term	Session
Tempe	Fall	Regular
ASU Online	Fall	Regular
ASU Online	Fall	Session B (ASU Online only)
Tempe	Spring	Regular
ASU Online	Spring	Regular
ASU Online	Spring	Session B (ASU Online only)
ASU Online	Summer	Regular

Application Deadlines

Modality	Term	Session	Deadline	Type
In-Person	Fall	Session A/C	2026/07/24	Priority
Online	Fall	Session A/C	2026/07/24	Priority
Online	Fall	Session B (Online Only)	2026/09/17	Priority
In-Person	Spring	Session A/C	2026/12/15	Priority
Online	Spring	Session A/C	2026/12/15	Priority
Online	Spring	Session B (Online Only)	2026/02/16	Priority
Online	Summer	Session A/C	2026/04/20	Priority

Program Admission Deadline Website Address
https://scai.engineering.asu.edu/graduate-admissions/

Fees

Is a program fee required?
No

Degree Search and Operational Information

Marketing Description

Unlock the power of AI and machine learning! Gain cutting-edge skills to design intelligent systems and transform data into actionable insights.

Degree Search Program Description

Artificial Intelligence (AI) and Machine Learning (ML) are transforming industries by enabling systems to learn, adapt, and make data-driven decisions. This graduate-level microcertificate provides a rigorous foundation in the principles and applications of AI and ML, preparing students to design and implement intelligent solutions for complex problems.

The curriculum emphasizes both theoretical understanding and practical skills, covering topics such as supervised and unsupervised learning, deep learning architectures, natural language processing, and predictive analytics. Students will gain experience applying algorithms to real-world datasets, optimizing models for performance, and leveraging AI techniques for emerging technologies.

Upon completion, graduates will be equipped to:

- Develop and deploy machine learning models for diverse applications.
- Apply AI techniques to areas such as computer vision, language processing, and decision systems.
- Evaluate and improve model accuracy, scalability, and ethical considerations in AI.

Provide a brief description of career opportunities available for this program.

Graduates of this program will be prepared for high-demand roles in AI and data-driven industries, including:

- Machine Learning Engineer
- AI Engineer
- Data Scientist
- Deep Learning Specialist
- Natural Language Processing (NLP) Engineer
- AI Product Manager
- Predictive Analytics Specialist

These roles are in demand across technology, healthcare, finance, manufacturing, and government sectors.

Global Experience: Provide a brief description of global opportunities or experiences (study abroad, international internships) available for this program.

ONET/SOC Codes: Career Options

15-2051.00 Data Scientist43-9111.00 Data Analyst

Professional Licensure

N/A

Additional Professional Licensure Information

Degree Search Contact Information and Support

Building Code
Centerpoint (CTRPT)

Room Number
105

Program Email Address
scai.grad.admission@asu.edu

Program Office Telephone Number
480-965-3199

Program Website Address
https://scai.engineering.asu.edu/

Keywords
Computer ScienceArtificial IntelligenceMachine Learning

List New Keywords

Select one (1) primary area of interest from the list below that applies to this program
Computing & Mathematics

Select one (1) secondary area of interest from the list below that applies to this program
STEM

Program Assessment

Attach a PDF copy of the assessment plan printed from the University Office of Evaluation and Educational Effectiveness assessment portal demonstrating UOEEE's approval of your assessment plan for this program.

- MCERT1738085443_UOEEE_received (3) - AI and Machine Learning.pdf

Supporting Documents

Additional Supporting Documentation (Impact statements should be above under Collaboration and Impact)

Please describe the attached files and their relevance to the proposal.
Sergio Quiros sent over impact statements.

Dependencies

Dependencies
There are no dependencies

From:	Karen Schupp
To:	Sergio Quiros; Teresa Wu
Cc:	Amanda Osman; Amanda Morales-Calderon; Sophia Mcgovern; Jeremy Helm; Patrick Phelan (Professor); Allison Curran
Subject:	Re: Microcertificate in AI and Machine Learning – Statement of Support Request
Date:	Friday, November 7, 2025 4:42:51 PM

Hello Dean Wu:

The Herberger Institute for Design and the Arts supports the proposed graduate microcertificate in AI and Machine Learning.

Thanks,

Karen Schupp (she/her)
Associate Dean of Academic Programs and Curriculum
Herberger Institute for Design and the Arts
Arizona State University

Professor of Dance
School of Music, Dance and Theatre
Arizona State University

Senior Global Futures Scholar
Julie Ann Wrigley Global Futures Laboratory
Arizona State University

Editor-in-Chief
Journal of Dance Education

Want to meet? Schedule an appointment via Outlook or Calendly.

> On Nov 7, 2025, at 3:33 PM, Sergio Quiros <Sergio.Quiros@asu.edu> wrote:
>
> *Sent on behalf of Teresa Wu*
>
> Hello,
>
> I am writing to request an impact/support letter (email will suffice) for the proposed Microcertificate in AI and Machine Learning.
>
> The Graduate College has requested a response by November 13, 2025.
>
> Let me know if you have any questions or need additional information.
>
> Teresa Wu
> Vice Dean, Academic and Student Affairs
> President's Professor, School of Computing and Augmented Intelligence

Director, ASU-Mayo Center for Innovative Imaging
Ira A. Fulton Schools of Engineering
Arizona State University

Sergio Z. Quiros

Assistant Director of Academic Administration
Ira A. Fulton Schools of Engineering
Arizona State University
Tempe, AZ 85287-8109
Phone: 480/727-5770
Email: Sergio.Quiros@asu.edu

<Microcertificate in AI and Machine Learning Proposal.pdf>

MCERT in Artificial Intelligence and Machine Learning

ES-Ira A Fulton Schools of Engineering

Mission

The AI and Machine Learning (ML) microcertificate equips students from formal and informal mathematical and computing backgrounds with the essential AI algorithms, tools, and theory specific to ML, enabling them to succeed in rapidly increasing professional roles or graduate studies in AI. The program combines the rigorous application of AI/ML theory with hands-on practice to advance problem-solving, critical thinking, and applied computing skills, aligning with the ASU charter of inclusion, public value, and academic excellence.

Goals

The goal of the AI/ML microcertificate is to have students learn about artificial intelligence through theoretical and practical lenses. Through a series of lectures and team-based projects, students will gain an understanding of statistical machine learning, supervised and unsupervised learning, knowledge representation and reasoning, deep learning and related techniques.

Outcome 1

Students will be able to train and optimize machine learning algorithms.

Concepts	Competencies
statistical methods, data extraction and cleaning, feature engineering, training, validation, optimization	Students will apply mathematics (statistics-based), model a problem domain to extract features for a machine learning model, create programs to extract, clean, and format data from "noisy" data sources, apply programming and tools to train machine learning algorithms including deep neural networks, naive bayes, decision trees, support vector machines, and random forests.

Assessment Process

The learning outcome will be assessed using 2 direct measures. Direct data evaluated by the rubric in Measures 1.1 and Measure 1.2 will be assessed for all students enrolled in the courses CSE571 Artificial Intelligence and CSE575 Statistical Machine Learning. Note that all students in the microcertificate must take at least one of these two courses. Program

assessment data will be reviewed annually by the lead faculty in collaboration with EDO/GOEE leadership and the results presented to FSE leadership as part of the program's continuous improvement process. If problems are revealed, a faculty working group led by the faculty director and GOEE's leadership will be established to determine optimal corrective actions, such as updating program curricula or revising specific courses to better satisfy program learning outcomes.

Measure 1	Performance Criterion 1
CSE575 Statistical Machine Learning: a course project in will be assessed using a faculty developed rubric.	80% of students will achieve a level of Competent or better on the faculty developed rubric.
Measure 2	**Performance Criterion 2**
CSE571 Artificial Intelligence: a course project will be assessed using a faculty developed rubric.	80% of students will achieve a level of Competent or better on the faculty developed rubric.