

# PRINCIPLES OF MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE, CERTIFICATE OF ACHIEVEMENT

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## In Workflow

1. 1PS Curriculum Rep ()
2. Curriculum Coordinator ()
3. College Curriculum Committee Chair ()
4. Authors ()
5. 1PS Curriculum Rep ()
6. Curriculum Coordinator ()
7. College Curriculum Committee Chair ()
8. BACCC ()
9. FHDA Board of Trustees ()

## Approval Path

1. Tue, 14 Jan 2025 22:31:35 GMT  
Kyle Taylor (taylorkyle): Approved for 1PS Curriculum Rep
2. Fri, 17 Jan 2025 22:42:57 GMT  
Mary Vanatta (vanattamary): Approved for Curriculum Coordinator
3. Tue, 28 Jan 2025 17:55:52 GMT  
Mary Vanatta (vanattamary): Approved for College Curriculum Committee Chair
4. Mon, 19 May 2025 22:12:59 GMT  
Eric Reed (reederic): Approved for Authors#234
5. Thu, 22 May 2025 14:39:49 GMT  
Kyle Taylor (taylorkyle): Approved for 1PS Curriculum Rep
6. Fri, 23 May 2025 23:02:59 GMT  
Mary Vanatta (vanattamary): Approved for Curriculum Coordinator

## New Program Proposal

Date Submitted: Thu, 12 Dec 2024 20:54:14 GMT

**Viewing: Principles of Machine Learning and Artificial Intelligence, Certificate of Achievement**

**Last edit: Thu, 22 May 2025 20:47:27 GMT**

Changes proposed by: Eric Reed (20176435)

## Basic Information

### Faculty Author(s)

#### Users

Eric Reed

### Department

Computer Science

### Division

Science Technology Engineering and Mathematics

### Title of Degree/Certificate

Principles of Machine Learning and Artificial Intelligence

### Type of Award

Certificate of Achievement

### Workforce/CTE Program:

Yes

### Effective Catalog Edition:

2025-2026

## New Degree or Certificate Proposal

**Which academic departments will be involved in the creation of this new degree/certificate? Are any new departments being created?**

Computer Science and this degree will include courses from Math (MATH 10) and Humanities (HUMN 15).

**Does De Anza offer a similar degree or certificate?**

No, however they have a similar certificate planned.

**What is the educational need for this new degree/certificate?**

AI/ML is an emerging field with a great deal of student interest and career potential. LMI data indicates that labor demand is growing.

**How does the degree/certificate align with Foothill's Strategic Vision for Equity?**

This certificate aligns with the completion goal. This certificate is relevant to continuing in CS education and earning gainful employment.

## Certificate of Achievement Workforce Narrative

### Program Goals and Objectives

The Certificate of Achievement in Principles of Machine Learning and Artificial Intelligence will provide a foundational education in the algorithms and applications of AI. The certificate will offer an introductory level of programming and data science curricula, as well as a course in ethics specific to this field, with minimal prerequisites so as to be attainable within one academic year. In addition, this certificate would be intended to serve as a pathway for students who wish to pursue more advanced programs planned for Foothill College in the future.

### Program Learning Outcomes

#### Program Learning Outcomes

Students will be able to use Jupyter notebooks or similar programs to load and preprocess data, train and validate models, and visualize results.

Students will be able to write programs that traverse complex discrete state spaces to reach a goal or optimize an outcome.

Students will be able to design adversarial agents that approximate optimal behavior with incomplete environmental information.

Students will be able to explain the causes of biased outcomes in poorly designed models, as well as how to overcome them.

### Catalog Description

The Certificate of Achievement in Principles of Machine Learning and Artificial Intelligence provides foundational knowledge in this growing field. This certificate is relevant for students looking to enter the workforce, learn new skills in an existing role, or work toward other certificates and degrees in computer science, artificial intelligence, and machine learning.

### Core Courses

**Core Course Units: 22**

Code	Title	Units
C S F003A	OBJECT-ORIENTED PROGRAMMING METHODOLOGIES IN PYTHON	4.5
C S F008A	INTRODUCTION TO DATA SCIENCE	4.5
C S F011A	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	4.5
C S F012A	INTRODUCTION TO MACHINE LEARNING	4.5
HUMN F015. or PHIL F015.	ETHICS IN ARTIFICIAL INTELLIGENCE	4

**Total Units:**

22

### Proposed Sequence

Term	Units
Year 1, Fall	8.5
Year 1, Winter	9
Year 1, Spring	4.5

### Master Planning

The Certificate of Achievement in Principles of Machine Learning and Artificial Intelligence is aligned with Foothill College's mission statement regarding preparing students for the workforce in addition to critical thinking skills and technical knowledge to be a

productive member of a democratic society. The certificate will also prepare students for a local degree, which is also aligned with Foothill College's goals.

### Enrollment and Completer Projections

The initial year is expected to have 30 students complete this certificate. The courses to be introduced in Fall 2025 that comprise the core subject matter for this certificate—C S 11A and C S 12A—are expected to be highly in-demand and reach an enrollment of 40 students per section, with one section of both courses anticipated to be available for the Fall, Winter, and Spring terms of the 2025-2026 school year. The future addition of more advanced certificates and degrees in Artificial Intelligence and Machine Learning are expected to result in higher rates of completion for this certificate compared to its initial year offering.

Historical information is from 2022-23 and 2023-24. We are now offering C S 8A, which has had strong enrollment in its initial two quarters, two sections online in Winter 2025 with 71 students total, one section in person in Spring 2025 with 26 students total.

### Historical Enrollment Data

Course #	Course Title	Y1 - Annual Sections	Y1 - Annual Enrollment	Y2 - Annual Sections	Y2 - Annual Enrollment
C S 3A	OBJECT-ORIENTED PROGRAMMING METHODOLOGIES IN PYTHON	19	696	17	660
C S 8A	INTRODUCTION TO DATA SCIENCE	N/A	N/A	N/A	N/A
C S 11A	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	N/A	N/A	N/A	N/A
C S 12A	INTRODUCTION TO MACHINE LEARNING	N/A	N/A	N/A	N/A
HUMN 15	ETHICS IN ARTIFICIAL INTELLIGENCE	N/A	N/A	N/A	N/A
PHIL 15	ETHICS IN ARTIFICIAL INTELLIGENCE	N/A	N/A	N/A	N/A

### Place of Program in Curriculum/Similar Programs

This certificate is new. It may serve as a standalone certificate for workforce training or as a pathway to the planned advanced AI/ML certificate(s) and/or Artificial Intelligence AS degree. There is not currently a program like this at Foothill College.

### Similar Programs at Other Colleges in Service Area

De Anza College presently has a proposal for a Certificate of Achievement in Applied Artificial Intelligence through their Computer Science and Information Systems department.

### TOP Code

\*0707.00 - Computer Software Development

### CIP Code

11.0201 - Computer Programming/Programmer, General.

### Will any new resources be required (e.g., facilities, equipment, personnel)?

No

### Gainful Employment:

Yes

### Distance Education:

100%

**Please note that significant lead time (one month or longer) may be necessary to obtain the following documents/ approvals. Please work with the AVP of Instruction during the beginning stages of program creation to submit your requests for the following:**

**Labor Market Information and Analysis**

Bay\_LMA\_Artificial Intelligence for Business\_24-25 (1)[67].pdf

Key: 234