

De Anza College

Program Outline Report

Program Basics

Program Title:	Applied Artificial Intelligence Certificate of Achievement - Advanced
Program Status:	In development
Department:	CIS - Computer Sci and Info Systems
Award Type:	Certificate of Achievement-Advanced (COA-A) (Credit)
Program Description	The Certificate of Achievement - Advanced in Applied Artificial Intelligence (AI) continues from the knowledge gained in the Certificate of Achievement. Students will work with more in-depth machine learning and AI modules, toolkits, and frameworks to solve hands-on applications with real world data. Students will also use programming skills and math and statistics techniques to apply and evaluate both classical and deep learning models. The certificate culminates in a capstone project where students apply AI skills and knowledge in a real-world application.
Control Number:	No value
Credential ID:	COAA_Applied Artificial Intelligence
TOP Code (SP01) :	0799.00
TOP Code (SP01) :	*Other Information Technology
CIP Code:	(11.0102) Artificial Intelligence.
Maximum Units:	44
Minimum Units:	40.5
Curriculum Committee Approval Date:	No value
Board of Trustees Approval Date:	No value

Proposal Details

Proposal Start: Fall 2026

Submission Rationale

- New Program

Program Files Upload

Program Requirements File - ALL certificate/degree programs

ProgramRequirements_AppliedAI_COAA_2026F.docx

 Download

LMI File - ALL CTE certificate/degree programs

LMI_AppliedAI_COAA_2026F.pdf

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Advisory Board Minutes File - Credit CTE certificate/degree programs ONLY

AdvisoryMinutes_AppliedAI_COAA_2026F.pdf

 Download

Regional BACCC Minutes File - Credit CTE certificate/degree programs ONLY

No Value

TMC Template File - Transfer degree programs ONLY

No Value

ASSIST File(s) - Transfer certificate/degree programs ONLY

No Value

Program Goal

Program Goal

CTE

Program Header

Program Header

Computer Science and Information Systems – Artificial Intelligence

Program Division

Program Division

2CB

Program Sub-Award

Program Sub-Award

NA

Comments - Program

Stage 2: CTE Dean

No Value

Stage 3: Department Chair

No Value

Stage 4: Division Curriculum Representative

No Value

Stage 5: Division Dean

No Value

Stage 6: SLO Coordinator

No Value

Stage 8: Articulation Officer

No Value

Stage 9: Curriculum Committee

No Value

Curriculum Office - Program**Program Distance Education**

0% (0000)

Program Apprenticeship

No

Program CDCP Eligibility Criteria

NA

Program Employment Potential

LMID EDD Consultant (Imidedd)

Program Code

No Value

Curriculum Office Notes

No Value

Program Requirements**COAA_Applied Artificial Intelligence (Total 40.5-44)****Complete all of the following**

IMPORTANT NOTE: Some courses have prerequisites; see the college catalog for more information. 0

IMPORTANT NOTE: Some courses have a cross-listed and/or honors version. Students will receive credit for only one version of the course. 0

Required Core: (Total 25.5)**Complete all of the following**

CISD017A - Introduction to Machine Learning	4.5
CISD017B - Foundations of Machine Learning	4.5
CISD040. - Introduction to Programming in Python	4.5
CISD051. - Introduction to Prompt Engineering	4.5
CISD067. - Implementing Responsible AI	4.5
CISD082Y - Current Topics in Computer Information Systems	3

List A - Complete one option: (Total 6.5-9.5)**Complete the following number of units: 6.5-9.5****Option 1: (Total 9.5)****Complete the following number of units: 9.5**

CISD007. - Introduction to Artificial Intelligence	4.5
STATC1000 - Introduction to Statistics	5
STATC1000H - Introduction to Statistics - HONORS	5

Option 2: (Total 6.5)**Complete all of the following**

CISD011. - Foundations of Data Science for All	4.5
CISD111X - Support for Foundations of Data Science for All	2

List B - Complete one option: (Total 8.5-9)**Complete the following number of units: 8.5-9**

Option 1 - Deep Learning: (Total 9)**Complete all of the following**

CISD078. - Introduction to Deep Learning	4.5
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CISD080. - Introduction to Natural Language Processing	4.5
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Option 2 - Data Analytics: (Total 8.5-9)**Complete the following number of units: 8.5-9**

CISD044A - Database Management Systems	4.5
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CISD044F - Introduction to Big Data and Analytics (Being Revised)	4
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CISD064B - Introduction to SQL	4.5
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CISD064C - Introduction to PL/SQL	4.5
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CISD064G - Data Visualization Methodology and Tools	4.5
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Option 3 - Software Engineering: (Total 9)**Complete the following number of units: 9**

CISD022C - Data Abstraction and Structures	4.5
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CISD22CH - Data Abstraction and Structures - HONORS	4.5
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CISD041A - Python Programming	4.5
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CISD041B - Advanced Python Programming	4.5
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CISD044H - R Programming	4.5
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Option 4 - General: (Total 8.5-9)**Complete the following number of units: 8.5-9**

CISD022C - Data Abstraction and Structures	4.5
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CISD22CH - Data Abstraction and Structures - HONORS	4.5
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CISD041A - Python Programming	4.5
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CISD041B - Advanced Python Programming	4.5
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CISD044A - Database Management Systems	4.5
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CISD044F - Introduction to Big Data and Analytics (Being Revised)	4
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CISD044H - R Programming	4.5
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CISD064B - Introduction to SQL	4.5
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CISD064C - Introduction to PL/SQL	4.5
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CISD064G - Data Visualization Methodology and Tools	4.5
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CISD078. - Introduction to Deep Learning	4.5
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CISD080. - Introduction to Natural Language Processing	4.5
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Recommended Sequences

No value

Program Outcomes

COAA_Applied Artificial Intelligence

PSLO

Performance

Explain machine learning concepts, identify machine learning problems, and apply and evaluate machine learning models 100

Explain statistics and math concepts in machine learning algorithms 100

Implement and apply basic deep learning algorithms and models, and interpret and evaluate the results 100

Explain natural language processing (NLP) concepts and implementation, apply and evaluate NLP algorithms in human language applications 100

Program Narrative

1. Program Goals and Objectives

The Certificate of Achievement - Advanced in Applied Artificial Intelligence (AI) continues from the knowledge that is built in the Certificate of Achievement. Students will work with more in-depth machine learning and AI libraries, toolkits, and frameworks to solve hands-on applications with real world data. Students will also use more programming skills and math and statistical techniques to apply and evaluate learning models.

2. Master Planning

Prior to 2020 De Anza Computer Science & Information Systems (CIS) department introduced the courses that would become foundational to Data Science courses and the AI program. Prior to 2020, three Python courses and one R programming course were created and being taught. These form the foundation for data science and artificial intelligence work. CIS 9 Introduction to Data Science will be replaced over the next two years. CIS 11 and its support course is slated to be offered Fall 2025. Seven courses focused on artificial intelligence will become effective and be ready to be offered: Introduction to Artificial Intelligence, Introduction to Prompt Engineering, Implementing Responsible AI, Introduction to Deep Learning, Introduction to Machine Learning, Foundations of Machine Learning, Introduction to Natural Language Processing.

The need for this proposed program is evident. According to ProFocus, a recruiting firm, (<https://www.profocus technology.com/general/tech-employment-2024-market-trends-report/>): "Artificial intelligence continues to dominate tech job openings, with a notable 5.6% rise in AI vacancies from Q1 to Q2 of 2024. This marks a 31.5% increase compared to 2023."

CompTIA, a trade association that provides certification and training in technology, stated that (<https://connect.comptia.org/blog/artificial-intelligence-statistics-facts>):

- AI technology is expected to create 12 million more jobs than it is expected to replace.
- Jobs are anticipated to be in high demand, with 97 million specialists needed in the AI industry by 2025.
- More than 1 in 4 dollars invested in American startups in 2023 went to an AI-related company.

3. Enrollment Numbers

Course ID	Year 1 (2023-24)		Year 2 (2024-2025)	
	Annual # Sections	Annual Enrollment Total	Annual # Sections	Annual Enrollment Total
CIS 17A	new	new	new	new
CIS 17B	new	new	new	new
CIS 40	20	658	21	667
CIS 51	new	new	new	new
CIS 67	new	new	new	new
CIS 82Y	0	0	0	0

4. Place of Program in Curriculum/Similar Programs

This is one of four AI related programs the CIS department is introducing. These four programs are scaffolded, each centered on anticipated student goals:

- Applied Artificial Intelligence Certificate of Completion is designed to provide students with knowledge and skills required for a variety of entry level positions in the field of Artificial Intelligence.
- Applied Artificial Intelligence Certificate of Achievement
- Applied Artificial Intelligence Certificate of Achievement – Advanced is the pathway to more in-depth learning of skills necessary in working as a professional in data science and artificial intelligence fields.
- Applied Artificial Intelligence Associate of Science ensures that the student has a degree fulfilling general education requirements in addition to the skills needs to work in jobs needing skills to employ artificial intelligence in solving organizational needs.

This award does not replace any existing reward although with the introduction of the new data science course and these AI programs the CIS 9 Introduction to Data Science will be phased out.

5. Similar Programs at Other Colleges in Service Area

Within the Service area of De Anza College (Foothill College, Mission College, and West Valley College) only Mission College currently offers a program in Artificial Intelligence: Certificate of Achievement in Artificial Intelligence. This certificate offers an introduction to each area of AI: Introduction to Artificial Intelligence, Introduction to Deep Learning, Introduction to Data Analysis, Introduction to Machine Learning along with a foundational course in Python programming.

Unlike Mission College, this certificate is also offered as noncredit Certificate of Completion. Another, perhaps more important difference is that an emphasis of this certificate is on using AI on the job with the course in prompt engineering and another in using AI responsibly.

Multiple faculty members have been attending meetings and workshops in conjunction with UC Berkely's Data Science and AI programs. This has shaped our program to incorporate their Data 8 course and to create our courses as UC transferable.

6. Enrollment and Completer Projections

A pivotal course in this certificate is CIS 40 Introduction to Programming in Python. Between 2020-21 academic year and 2023-24 the enrollment in this course rose by 18% to 659 for the academic year of 2023-24.

Considering the projection in needs as presented by the US Bureau of Labor Statistics

(<https://www.bls.gov/careeroutlook/2025/article/fastest-growing-industry-sector.htm>

(<https://www.bls.gov/careeroutlook/2025/article/fastest-growing-industry-sector.htm>)) demonstrates demand will be high for completers of this program.

Chart 2. Fastest growing occupations in professional, scientific, and technical services, projected 2023–33 (percent)

Occupation	Employment percent change, 2023–33
Data scientists	41.7
Information security analysts	41.4
Computer and information research scientists	31.6

