CPS 242: AI AGENT DEVELOPMENT

History

1. Mar 10, 2026 by Scott Shaper (sshaper)

Viewing: CPS 242 : AI Agent Development
Last approved: 2026-03-10T19:13:43Z
Last edit: 2026-03-05T19:38:42Z

Effective Term

Winter 2027

Rationale and proposal summary

The purpose of this course is to provide students with the technical and ethical foundations needed to design and deploy intelligent AI-driven applications. As artificial intelligence rapidly transforms industries, the ability to integrate large language models into secure, functional software systems has become an essential skill for modern developers.

This course bridges computer programming, web development, and AI technologies by combining Python, Flask, JavaScript, and database management with API (Application Programming Interface). Students learn not only how to build AI agents that respond intelligently and interact naturally with users, but also how to secure, deploy, and evaluate them responsibly.

The rationale for offering this course is to prepare students for emerging roles in AI application development, automation, and data-driven problem solving. By emphasizing hands-on projects, ethical practices, and real-world integration, the course equips learners to design professional, secure, and scalable AI systems ready for production environments.

Course Cover

Full Course Title

AI Agent Development

Transcript Title

AI Agent Development

Subject Code

CPS - Computer Science

Course Number

242

Department

Computer Instruction Dept (CISD)

Banner Division

BCT

Division/College

Business/Computer Technologies (BC)

Org Code

13400

Course Description

In this course, students will explore the development of intelligent AI agents using Python, Flask, and industry-standard AI models' Application Programming Interface (API). Students will learn to design, build, and deploy secure applications that leverage large language models for conversational and task-based interactions. Key topics include prompt engineering, conversation memory, retrieval-augmented generation (RAG), database integration, and front-end communication with JavaScript. Emphasis is placed on secure coding, ethical AI practices, and professional deployment techniques. Through a series of guided projects culminating in a final capstone, students will gain hands-on experience creating fully functional AI-driven web applications.

Planned Delivery Format

Face to Face
Online

Has this course been approved for virtual or blended virtual?
No

Has this course been approved for online or online blended?
No

Grading method
Standard Letter, Audit, Academic Forgiveness

CIP Code
110102 - Artificial Intelligence.

Occupational Indicator
Yes

ACS Code
120

Credit hours, contact hours, repeatability

Repeatable for additional credit
No

Course credits
4

Lecture contact hours
60

Total Contact Hours
60
Expected Total Contact Hours
60

Prerequisites and prerequisite skill levels

College-Level Math
Level 2

College-Level Reading and Writing
College-level Reading and Writing

Approved Level I Prerequisite:
Academic Reading and Writing Levels of 6; Academic Math Level 2; CIS 120; CIS 282, may enroll concurrently; CPS 141

Is concurrent enrollment an option for this prerequisite?
Yes

Which courses?
CIS 282

Course Assessment Plan
Learning Outcome

Outcome
Develop secure and functional AI-driven applications using Python and industry-standard AI model APIs.

Assessment #1

Assessment Tool
Outcome-related programming project

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Two Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Departmentally-developed rubric

Who does the scoring?
Departmental faculty

Standard of success
70% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome
Develop interactive web applications that integrate AI functionality through Flask and JavaScript.

Assessment #1

Assessment Tool
Outcome-related programming project

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Two Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Departmentally-developed rubric

Who does the scoring?
Departmental faculty

Standard of success
70% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome
Apply database and retrieval techniques to add persistence and intelligence to AI agents.

Assessment #1

Assessment Tool
Outcome-related programming project

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Two Years

Anticipated assessment population
All students from all sections

How the assessment will be scored
Departmentally-developed rubric

Who does the scoring?
Departmental faculty

Standard of success
70% of students will score 70% or higher.

Assessment #2

Learning Outcome

Outcome
Deploy a secure, full-stack AI agent demonstrating ethical and professional practices.

Assessment #1

Assessment Tool
Outcome-related programming project

Anticipated Next Assessment Year
2029

Anticipated Next Assessment Term
Fall

Assessment Cycle
Every Two Years

Anticipated assessment population
All students from all sections

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Assessment #2

Course Objectives

	Objective(s)
1.	Configure and protect environment variables and API keys using secure methods (Outcome 1).
2.	Demonstrate correct use of API parameters to control model behavior (Outcome 1).
3.	Demonstrate how API requests and responses support AI agent communication (Outcome 1).
4.	Create Flask routes and templates to display user input and AI responses (Outcome 2).
5.	Use JavaScript Fetch API to send asynchronous requests and display results dynamically (Outcome 2).
6.	Design and test user-friendly interfaces that enable seamless AI interaction (Outcome 2).
7.	Implement user authentication using secure password hashing (Outcome 3).
8.	Store and retrieve user conversations using SQLite or equivalent (Outcome 3).
9.	Apply embeddings and similarity search for context-aware retrieval (Outcome 3).
10.	Deploy Flask-based AI applications securely using environment variables (Outcome 4).
11.	Integrate authentication, persistence, and retrieval in a production-ready AI agent (Outcome 4).
12.	Demonstrate awareness of ethical AI design principles and data security practices (Outcome 4).

Resources

Will there be an additional fee on this course?
No

Are you planning to use First-Day resources?
No

Will this course always be OER/No Cost Resources?
No

Describe any resource needs
Students may have to pay a fee to purchase their API key from open AI. This cost should be now more than 5 or 10 dollars a month

General Education Area(s)

Area 1: Writing
No

Area 2: 2nd Writing or Communication/Speech
No

Area 3: Mathematics
No

Area 4: Natural Science
No

Area 5: Social and Behavioral Science
No

Area 6: Arts and Humanities
No

MTA General Education
No

Review

Is conditional approval requested?

No

Is this course currently conditionally approved, and you are now submitting it for full approval?

No

Reviewer Comments

Eva Samulski (esamulski) (2025-11-18T21:13:50Z): Narrative says "Prerequisites: Python, Linux, and Databases." Only CPS 141 is listed a pre-req. CIS 282 is listed as co-req. and CIS 121 - Linux isn't listed at all as a pre-req. Can we clean this up?

Eva Samulski (esamulski) (2025-11-18T21:21:14Z): The narrative states "Prerequisites: Python, Linux, and Databases." CPS 141: Introduction to Programming Using Python was listed as a pre-req. CIS 120: Linux/UNIX I: Fundamentals was in the narrative as a pre-req. but was not listed as a pre-req. I added it. CIS 282 is listed as a pre-req in the narrative and then listed as a co-req. What is correct?

Eva Samulski (esamulski) (2025-11-18T21:22:30Z): Rollback: Scott ~ please look at my comments and adjust accordingly. Thanks. Eva

Scott Shaper (sshaper) (2025-11-24T15:37:20Z): Rollback: click the wrong button

Sera Bird (sabird) (2025-12-08T22:04:59Z): AI program proposal lists CIS 282 as prereq for CPS 242 - it's listed as coreq here. Boilerplate language needed for description, assessment plan and objectives.

Ben Linford (bjlinford) (2026-02-20T19:24:50Z): Approving for Curriculum Committee Chair and Assessment Committee Chair with emailed approval 2/20/26 -BL

Key: 9247