LINC 78A: COMPUTATIONAL THINKING FOR EDUCATORS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	2
Hours:	2 lecture per week (24 total per quarter)
Advisory:	Experience with internet software tools, browsers, hyperlinks, online media resources, and basic skills using a computer.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Apply computational thinking concepts to solve problems.
- Define and explain abstraction, automation, and analysis.

Description

Computational thinking is an essential problem-solving skill in the digital age. This course, which is designed for educators, provides instruction in components of computational thinking, including data analysis, abstraction, and algorithms. Students learn how to add computational thinking concepts into many content areas, with a special emphasis on related NGSS and Common Core Math computational thinking practices, including opportunities to integrate these concepts into instructional practices in multiple and interdisciplinary areas within education.

Course Objectives

The student will be able to:

1. Define and explain abstraction, automation, and analysis
2. Apply computational thinking concepts to solve problems
3. Apply computational thinking concepts to an interdisciplinary instructional practice of teaching

Course Content

1. Components of computational thinking
   a. Abstraction
   b. Automation
   c. Analysis
2. Computational thinking concepts to solve problems
   a. Learn to collect and analyze data to solve problems
   b. Work on debugging code to strengthen CT skills
   c. Work on computational thinking lessons that integrate with relevant content area
3. Apply computational thinking concepts to an interdisciplinary instructional practice of teaching
   a. Development of a project, unit plan, or lesson plan that exhibits computational thinking concepts
   b. Presentation of project to real world audience for feedback and revision

Lab Content

Not applicable.

Special Facilities and/or Equipment

1. When offered on/off campus: Lecture room equipped with projector, whiteboard, and a demonstration computer connected online. Computer laboratories equipped with computers or laptops with internet access.
2. When taught via the internet: Students must have current email accounts and ongoing access to computers with web browsing capability and internet access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Developing a project utilizing computational thinking
Presenting their design and project to peers
Making constructive contributions to class discussions and peer reviews

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture presentations delivered in student-centered learning style, during which students take notes, follow demonstrations, or complete an activity

Facilitated discussions of live presentations, readings, or video presentations
Student presentations in small group and whole class situations

Representative Text(s) and Other Materials

Instructor-assigned notes, materials, and resources, including instructional materials, open education resources, multimedia, and websites.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Reading assignments include analysis of texts, selected examples, and student projects
2. Writing assignments include a course project and multiple developmental projects, reflections, discussion responses, and peer feedback on projects
3. Outside assignments include project planning and development, participation in online peer collaboration activities, and project development through an iterative process

When taught online, these methods may take the form of multimedia and web-based presentations. Assignments will be submitted online as well.

Discipline(s)

Instructional Design/Technology