California State University
SAN MARCOS

SCHOOL OF EDUCATION

Engaging diverse communities through leading and learning for social justice.

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Course Number	EDST 635 Section 1
Course Title	**Introduction to Computational Thinking and Programming**
CRN Number	22711
Course Location	**Online**
Semester / Year	**Spring 2016**
Instructor	**Matthew Evans**
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SCHOOL OF EDUCATION MISSION & VISION STATEMENT
(Adopted by SOE Governance Community, January 2013)

Vision
To serve the educational needs of local, regional, and global communities, the School of Education advances innovative practice and leadership by generating, embracing, and promoting equitable and creative solutions.

Mission
The mission of the School of Education community is to collaboratively transform education. We:
- Create community through partnerships
- Promote and foster social justice and educational equity
- Advance innovative, student-centered practices
- Inspire reflective teaching and learning
- Conduct purposeful research
- Serve the School, College, University, and Community

BASIC TENETS OF OUR CONCEPTUAL FRAMEWORK

- Student centered education
- Research and theory specific to the program field inform practice
- Connections and links between coursework and application
- Strong engagement between faculty and students
- Co-teaching clinical practice
- Culturally responsive pedagogy and socially just outcomes

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<div align="center">**COURSE DETAILS**</div>

Course Description

Prepares educators to develop basic understanding of computational thinking and programming to support 21st century teaching and learning.

> **Instructor Description:**
>
> This **graduate level course** is designed to help students develop a deep understanding of educational technology as a field, and critical thinking skills that are necessary for students to make informed decisions about technology integration in their own contexts. Educational technology as a scientific field examines the uses of media and technology in educational settings to enhance teaching and learning using various research methods such as experiments, surveys, case studies, design-based research, and ethnography. Because technology constantly changes, this course will focus on building fundamental knowledge about the relationship between teaching, learning, and technology rather than how to use a particular piece of software or hardware. It is acknowledged that students bring a diverse set of life and professional experiences, and with technology. To support self-directed and interest driven learning, the course is structured to give students flexibility to explore different topics and technologies through out the semester.

Course Prerequisites

The prerequisite for this course is basic computer knowledge and skills such as turning a computer on and off; opening, saving, and deleting a file; creating and deleting a folder; using e-mail and web browsers (i.e. Internet Explorer, Safari, Firefox, Google Chrome).

Credit Hour Policy Statement

Per the University Credit Hour Policy, students are expected to devote 45 hours per unit of credit (135 hours for 3 credit) for online courses.

<div align="center">**REQUIRED TEXTS, MATERIALS AND ACCOUNTS**</div>

1. There is NO required text for this course.

2. **Google Drive:** This is an online file storage service provided by Google. It allows users to create, share, and collaboratively edit files stored in the cloud. Students should have access to Google Drive through their CSUSM e-mail. If you do not have access to Google Drive, you can create an account at drive.google.com. Directions on how to create an account are available at: https://support.google.com/drive/answer/2424384?hl=en

3. **Additional File Storage:** While you can create, upload, and store files using Google Drive, you may need to use an additional secondary cloud file storage service such as Dropbox (You can create an account at www.dropbox.com) and/or purchase a USB stick (8GB or larger) to store large files.

4. **Cougar Course:** Course materials, assignment instructions, and grades will be available on Cougar Course site. Available at: http://cc.csusm.edu/. Be sure to set your preferred email in your profile settings of Cougar Courses so that you receive important announcements and communications. It is your responsibility to check the course site regularly and bring any issues immediately to the instructor's attention.

5. **Campus Resources:** In addition to attending class meetings, students may need to use campus resources for some assignments. It is the student's responsibility to make arrangements to have the technology resources available in order to complete scheduled assignments and due dates. All students must plan times they can work in labs on campus. Students are required to check campus resources and availability of labs. Mac computers are available in ACD 202, ACD 211, UH 271, and SCI2 306 in addition to other locations such as the library 2nd floor.

6. **Backing Up Work:** Many technology platforms you will be using in this course are online and require a username and password. However, for some assignments you will need to take a screenshot or copy/paste your work into a word file, therefore it is important that you backup your work. Suggested procedures for backing up your work include:
   a. Make an EDST 635 folder on your campus flash drive and save all your files in this folder
   b. Save a backup of all files on your home computer or
   c. Email files to yourself for further backup
   d. Save important email communications for the course in a folder on your flash drive in addition to your email account

COURSE LEARNING OUTCOMES

In the end of this course, students will learn:

1. a form of reasoning, or problem solving, called Computational Thinking (CT).

2. what a computer can do and the primitive operations it can perform.

3. what an algorithm is and learn to design simple algorithms.

4. a subset of programming applications and languages.

PARTICIPATION STRUCTURES

Discussion Forums:

Throughout the semester, you will engage in whole group discussions in the form of an online discussion forum around assigned readings using Cougar Courses. Each student will be responsible for answering discussion questions posed by the instructor, and responding to two of their classmates' posts. When participating in online discussion forums, make sure to respond directly to the discussion question, include pertinent information in your response, make reference to ideas previously discussed, and offer critical analysis of a key theme or existing post that deepens or extends the conversation.

Hangouts on Air:

Some weeks instead of participating in a discussion forum, students will meet online in pairs, groups of 2, to discuss the assigned readings, discuss assignments, and work together, for 45 minutes to 1 hour, and record their meeting using Google Hangouts on Air. Students will sign up for reading groups in the beginning of the semester, and will be responsible for arranging the time to meet. During the meetings, students will take on one of the following roles: starter, facilitator, skeptic, and summarizer. Each student will get a chance to take on different roles through out the semester.

GENERAL CONSIDERATIONS

School of Education Attendance Policy

Due to the dynamic and interactive nature of courses in the School of Education, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. Individual instructors may adopt more stringent attendance requirements. Should the student have extenuating circumstances, s/he should contact the instructor as soon as possible.

In this online course, the instructor has adopted this policy: you must be active in online coursework including email, discussions and activities regularly (at least twice weekly and/or at least every 3 days), or you cannot receive a grade of A or A-; if you are inactive for one week or more, you cannot receive a grade of B+ or B. If you have extenuating circumstances, you should contact the instructor as soon as possible. *Modules begin on Monday each week and end on the second Sunday of the following week (see online schedule).* It is expected that all EDST635 students will have an active presence in the online class community. Active presence is measured not only by the number of times you log on (minimum every 2-3 days) but also by the promptness, quantity, and quality of your postings, contributions to class discussions, messages you initiate to peers and instructor, assignments completed successfully and on time, and your responsiveness to questions posted by classmates. Organize each week so that you visit the Cougar Course shell every 2-3 days. This will provide you the opportunity to stay in touch with the class assignments and discussions.

CSUSM Academic Honesty Policy

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All assignments must be original work, clear and error-free. All ideas/material that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated accordingly.

Academic Honesty and Integrity: Students are responsible for honest completion and representation of their work. Your course catalog details the ethical standards and penalties for infractions. There will be zero tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole.

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

Refer to the full Academic Honesty Policy at:
http://www.csusm.edu/policies/active/documents/Academic_Honesty_Policy.html

Plagiarism

It is expected that each student (course participant) will do his/her own work, and contribute equally to group projects and processes. Plagiarism or cheating is unacceptable under any circumstances. If you are in doubt about whether your work is paraphrased or plagiarized see the Plagiarism Prevention for Students website http://library.csusm.edu/plagiarism/index.html. If there are questions about academic honesty, please consult the University catalog.

Students with Disabilities Requiring Reasonable Accommodations

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

All University Writing Requirement

The CSUSM writing requirement of 2500 words is met through the completion of course assignments. Therefore, all writing assignments for forum posts and replies, journals, assignments and project, and other coursework will be looked at for content, organization, grammar, spelling, and format.

Course Format

This course will be 100% online. There will be no physical meetings on campus. The course will consist of 7 learning modules and a final module concerning a final project and culminating experience. Each module will be two weeks. It is expected that each student be a consistently active participant in the course online community.

Necessary Technical Competency Required of Students

Students need to have consistent access to a computer with Internet access.

Contact Information for Technical Support Assistance

Contact the CSUSM help desk at helpdesk@csusm.edu for questions, technical issues with accessing files, and support for using the tools in Cougar Course. Student resources and login for Cougar Courses: http://cc.csusm.edu/

Use of Technology

Students are expected to demonstrate competency in the use of various forms of technology (i.e. word processing, electronic mail, Moodle, use of the Internet, and/or multimedia presentations). Specific requirements for course assignments with regard to technology are at the discretion of the instructor. Keep a digital copy of all assignments for use in your teaching portfolio.

Electronic Communication Protocol

Electronic correspondence is a part of your professional interactions. If you need to contact the instructor, e-mail is often the easiest way to do so. It is my intention to respond to all received e-mails in a timely manner. Please be reminded that e-mail and on-line discussions are a very specific form of communication, with their own nuances and etiquette. For instance, electronic messages sent in all upper case (or lower case) letters, major typos, or slang, often communicate more than the sender originally intended. With that said, please be mindful of all e-mail and on-line discussion messages you send to your colleagues, to faculty members in the School of Education, or to persons within the greater educational community. All electronic messages should be crafted with professionalism and care.
Things to consider:
- Would I say in person what this electronic message specifically says?
- How could this message be misconstrued?
- Does this message represent my highest self?
- Am I sending this electronic message to avoid a face-to-face conversation?

In addition, if there is ever a concern with an electronic message sent to you, please talk with the author in person in order to correct any confusion.

COURSE REQUIREMENTS AND GRADED COURSE COMPONENTS

Professional demeanor is expected of all students enrolled in EDST 635. This may be evidenced by:
- Consistently Active online. Please email the instructor concerning extenuating circumstance if you will not be actively participating online.
- Advance preparation of readings and timely submission of assignments.
- Solution Finding that uses carefully considered and culturally aware approaches.
- Supportive assistance to classmates with technical and/or content issues.
- Respectful participation in all settings (e.g. whole group, small group, Moodle Forums and study groups) with demonstration of positive interpersonal skills with classmates and guests.
- Backing up copies of all work. You will want these copies for your records and use in professional portfolio entries. Suggested procedures include:
  - Make an EDST 635 folder on your campus flash drive and save all your files in this folder
  - Save a backup of all files on your home computer or
  - Email files to yourself for further backup

- o   Save important email communications for the course in a folder on your flash drive in addition to your email account
  - ● Productive interaction with peers. Be aware that messages sent within an online context may be open to misinterpretation. When concerned, meanings should be verified to clarify sender's intent.

Select one or two class "buddies" (e.g., study group members or Moodle forum teammates) to ensure that you receive information and handouts if you must miss a class. Arrange an online check in time with your buddy, for prompting and reminders.

Grading Standards

All students are expected to participate in class activities and demonstrate reflective learning. It is important that students are well prepared for course sessions by completing the readings and assignments scheduled before the class meeting.

Each assignment and Forums are scored using points. Final grade will be determined by accumulated points throughout the semester.

94 – 100 A	90 – 93 A-
87 – 89 B+	84 – 86 B
80 – 83 B-	77 – 79 C+
74 – 76 C	70 – 73 C-
60 – 69 D	Below 60 F

Detailed information about each assignment is provided by on the class Cougar Course site. Please note that modifications may occur at the discretion of the instructor. Any changes to assignments will be clearly labeled and students will be notified.

You are responsible to track your grades and progress in the course. In order to successfully complete this course, *all assignments must be completed* at an acceptable level noted on assignment directions and rubrics. **All assignments will be due by 11:55 pm on the due date.**

Final Exam Statement

There is no Final Exam for the course.

Policy on Late/Missed Work

Points will be deducted if assignments are submitted late (10% penalty per day late; no credit will be awarded if the assignment is more than one week late).

*** *For Forums, if you do not post by the requested date, you will not receive credit as it then limits others' ability to respond.*

Students who wish to revise an assignment must negotiate the requirements of the revision with the instructor. It is expected that work will be turned in on time. Please discuss individual issues with the instructor promptly if extraordinary circumstances prohibit you from turning in assignments on time.

COURSE ASSIGNMENTS

Pair Programming: You will work on a design challenge with a fellow student in class and engage in pair programming-- a technique programmers use to collaboratively work on coding. Students will use Google Hangout to work on the design challenge together while alternating the roles of a driver and a navigator. Pairs will choose to edit and further develop the following project in Scratch to create a digital story: https://scratch.mit.edu/projects/29321004/#editor. Pairs must add at least one more sprite to the story, and utilize Motion, Looks, Sound, Events, and Control in their design.

Journaling: Throughout the course, at the end of some modules you will reflect on your learning and journal. Each journal you will be asked a specific question to reflect upon. In addition, for each journal, you should address the following three questions:

1. How is your understanding of computational thinking and programming evolving or changing?
2. How are you developing confidence in learning and teaching computational thinking and programming?
3. What are some challenges, difficulties, or barriers you have experienced?

Please connect the journals to the readings assigned or other readings you may have completed. Please make sure to reference any readings.

The journals are for your reflection. They will be a dialogue between only you and the instructor. There will be no judgment of what you write. Your writing will be a mindful practice for you. The instructor will be reading your journals with empathy and understanding. The journals are meant to be rich and authentic, please be honest with your reflections and try not to hold anything back.

Understanding of computing and computing languages:

1. code.org (blocks and coding)
2. codesters.com (python)
3. codecademy.com (HTML & CSS)

Final Project:

You have two options for a final project (see below). It is possible to collaborate on the final project. The only requirement is that you work in pairs and share the workload. You will have 2-3 weeks to work on your final project and submit the final version. Every final project will go through the following sequence:
> Draft & Peer Review
> Final Submission

Option 1:
Create a Google Slide presentation of inforgraphics, research, resources on why computational thinking should be taught in the K-12 environment. The presentation can act as a resource for your school site and/or district.

Option 2:
Create a game, a digital story, or an app using in Code.org, Scratch, or an application of your choice. Your design should involve interactive, engaging, and seamless (bug free) learner experience. Your design should address a learning goal and identify the targeted age group. For apps, make sure to have at least 5 pages with each page having a button that directs the learner to the home page and/or the next page. For games, make sure your game has a goal, rules, and core game mechanics (what players need to do to progress and beat the game). Your game must be playable. For digital stories, you have to have at least 3 characters, and a storyline with the following elements: problem, climax, and resolution. All project must utilize graphics/visuals.

Distribution of Points:

Assignments	Points
Intro. to CT: ***Code.org*** Complete "Course 1 (Ages4-6)" - 25 points Complete "Course 3 (All Ages)" - 25 points	50 points
Python: ***Codesters.com*** Complete "Introduction to Codesters Lesson - 50 points	50 points
HTML & CSS: ***Codecademy.com*** Complete "HTML & CSS Course: Unit 1 Introduction to HTML - 25 points Complete "HTML & CSS Course: Unit 4 Introduction to CSS - 25 points	50 points
Pair Programming: Scratch Work in pairs to complete an assignment using **Scratch**	50 points
Final Project: *Create Game or App*	150 points
Participation Structures	**Points**
Discussion Forums: *Initial Post:* 10 points *2 Peer Post:* 5 points per peer post x 2 20 points per discussion forum x 6* * Discussion forums are graded every week starting the first week of classes.	120 points
Journals: 20 points per meeting x 4	80 points
Google Hangout Meetings: 25 points per meeting x 2	50 points
Total:	600 points

SCHEDULE/COURSE OUTLINE

Please note that modifications to course activities and readings may occur at the discretion of the instructor. Any changes to assignments and/or structure of the course will be announced via e-mail. In order to successfully complete this course, *all assignments must be completed* at an acceptable level noted on assignment directions. **All assignments and course activities are due by 23:55 pm on the due date**.

Date	Topic	Assignment (if any)
Week 1 **Jan. 25 - 31** **Module 1**	● Introductions & Class Norms ● Review Syllabus, Cougar Courses Webpage & Resources ● How to Capture Screenshots ● Change profile picture in Cougar course ● Google Hangouts	**Forum Post #1:** "Introduce Yourself" ● Initial Post DUE Jan. 27 ● 2 Peer Posts DUE Jan. 31 **Assignment:** Complete Complete Survey: EDST 635 - Spring 2016 **Google Hangout #1 - Entire class** Sunday, Jan. 31 from 4:30 to 5:30 pm 1. Test that all can access and participate 2. Introductions 3. Practice Sharing screens
Week 2 **Feb. 1 - 7** **Module 1**	What is computational thinking (CT)?	**Watch:** Jeannette Wing on Computational Thinking **Read:** Wing (2006) Barr, Harrison, & Conery (2011) **Forum Post #2:** Why is it important to teach computational thinking in the K-12 classroom? ● Initial Post DUE February 3 ● Peer Posts DUE February 7
Week 3 **Feb. 8 - 14** **Module 2**	CT Core Concepts and Skills	**Read:** CT Teacher Resources (pp. 1-23) **Forum Post #3:** Find and share an example of CT from your own area of teaching. ● Initial Post DUE February 10 ● Peer Posts DUE February 14
Week 4 **Feb. 15 - 21** **Module 2**	Algorithms, Debugging, & Loops Introduction to Pair Programming	**Assignment:** Complete "Course 1 (Ages4-6)" - on Code.Org DUE February 21 **Read:** Prottsman (2014)
Week 5 **Feb. 22 - 28** **Module 3**	Abstraction & Problem Decomposition	**Assignment:** Complete "Course 3 (All Ages)" on Code.org DUE March 28 **Journal Entry #1:** DUE February 28

Date	Topic	Assignment (if any)
Week 6 **Feb. 29 - March 6** **Module 3**	Introduction to Scratch	**Read:** Computational Thinking with Scratch **Assignment:** Pair Programming DUE March 6
Week 7 **Mar. 7 - 13** **Module 4**	Introduction to Codesters	**Forum Post #4:** Pair Programming Reflection ● Initial Post DUE March 2 ● Peer Posts DUE March 6 **Assignment:** Complete "Introduction to Codesters Lesson" DUE March 13 **Journal Entry #2:** DUE March 13
Week 8 **Mar. 14 - 20** **Module 4**	Teaching CT and Programming I	**Read:** Czerkawski (2015) **Forum Post #5:** What skills and knowledge does an educator need to teach CT and programming/coding? ● Initial Post DUE March 16 ● Peer Posts DUE March 20
Week 9 **Mar. 21- 27**	**Spring Break**	**No class. Enjoy your break.**
Week 10 **Mar. 28 - April 3** **Module 5**	Introduction to HTML	**Assignment:** Complete "HTML & CSS Course: Unit 1 Introduction to HTML on Codecademy" DUE April 3 **Google Hangout #2 - Entire class** Sunday, Apr. 3 from 6:00 to 7:00 pm 1. CT Discussion
Week 11 **Apr. 4 - 10** **Module 5**	Introduction to CSS	**Assignment:** Complete "HTML & CSS Course: Unit 4 Introduction to CSS on Codecademy" DUE April 10 **Journal Entry #3:** DUE April 10
Week 12 **Apr. 11-17** **Module 6**	Teaching CT and Programming II	**Read:** Kak (2015) **Forum Post #6:** Has your knowledge, concept, and perspective of CT changed? ● Initial Post DUE April 14 ● Peer Posts DUE April 17
Session 13 **Apr. 18-24** **Module 6**	Final Project	**Review:** Sykora (2014) **Review:** Computational Leadership Toolkit **Forum Post #7:** Share Your Plan for Final Project ● Initial Post DUE April 20 ● Peer Posts DUE April 24

Date	Topic	Assignment (if any)
Session 14 **Apr. 25-May 1** **Module 7**	Final Project	
Session 15 **May 2-8** **Module 7**	Final Project Course Evaluations	**Final Project**: DUE May 15 **Journal Entry#4:** DUE May 15