

EDS 124AR: Teaching Computation in the Digital World

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Welcome!

Computers and data are everywhere. Just imagine a typical 24 hours in your life... How many different devices with computers do you use? How do interact with people you care about? How is study or work life having you use technology and for what purposes? Did you get a personalized ad offering you something to buy? Did you hear a news story which included a Tweet? We all live in multiple digital worlds that are changing rapidly with new apps, devices, and data analyses offering a constant stream of new innovations and ways technology integrates into our lives.

How important is it for everyone in our society to understand how these digital worlds work? How they influence our expectations and opportunities? In this course, we take the stand that **EVERYONE** needs a solid understanding of the digital worlds that they will live in. This class is about how we all, whether formal educators or interested professionals, can contribute to national efforts to prepare students to thrive in the digital world by learning about computing.

What does this course offer me?

In this course you will learn how to teach pre-college learners to be both savvy and effective participants in their digital worlds. Education in the last century was focused on the three R's: reading, writing, and arithmetic. This century we already see how computers, computation, and data are permeating not just our work, but also our relationships, communication, society, and even our sense of self.

No previous specific technical content or programming knowledge is needed. In this course you will explore current ways in which technology is impacting all of our lives and learn about the computing systems and programs underlying these advances. We believe that **computers and technology are important because they solve problems for humans** -- not just because they are "cool". After this course you will be able to answer questions based in various digitally-influenced worlds we live in, including:

- Personal Data: How has constant data collection and big data analysis impacted us

- Relationships: How have mobile, “smart” devices changed how we interact with others in personal ways?
- Careers & Work: How has the internet enabled new careers or changed expectations in traditional settings?
- Global: How is technology changing connecting our world and changing lives? How does technology-enabled communication change geopolitics?

After the course you will have learned what we aspire to teach pre-college students about how the technology that influences their digital worlds works. Through the activities of the course you will learn and apply practices to support your development as a reflective educational practitioner, applicable in any setting.

How, exactly, am I going to accomplish this?

In this class we take a project-based approach, looking at four “digital worlds” we all experience. We will explore each world through the following questions:

1. What are the **problems or challenges humans face in this area, what technology solutions have addressed them and what limitations are there on current solutions.** During this process you will learn the appropriate computing and technology content knowledge (e.g., how does streaming work?) and explore methods of how to teach this knowledge to learners.
2. **What are the impacts of these technologies on society, economy and culture? What consequences can these have on one’s online persona** (a lifelong, constructed online version of your real persona)? During this process you explore how to help learners develop analysis and argumentation skills, communicate appropriately with technical accuracy, and make technically informed decisions to protect one’s privacy.
3. **What are the “next steps” for technologies** that may transform solutions in this arena? During this process you will become comfortable with vetted resources for exploring the cutting edge of new technologies, as computing educators always have to be updating their knowledge to keep up with innovation.

At the end of each world, you will reflect on the process of your learning. How did the activities support your learning? What topics were hardest for you and why? Are there topics you need to learn about more deeply? Through these activities, you will begin to develop an understanding of how instruction and instructional activities can be designed to support learning. Additionally, we will focus on how instruction either supports or needs to better support diverse learners with varying access to technology, different cultural backgrounds, and different interests, among other things. Through these activities, we seek to help you develop as a more reflective teacher (and learner) -- a process all teachers employ to help best support the learning of the individuals they are working with.

How will I (and the professor) know if I am making progress in my learning?

As a fully online course, the way you will engage with this course will be radically different than many “traditional” courses. But, a benefit of being online is that all the activities you need to engage with to succeed in this course are laid out for you in specific detail as a series of modules in our online learning platform.

Our goal for you is to enable you to **master all the material in the course**, rather than to pick a specific date and measure how much you can learn by that date. That said, we still have to finish up by the end of the term, and we will be providing **weekly deadlines** throughout the course to help you keep from “getting behind”**. We also have synchronous sessions on Wednesdays, so we encourage you to think of this class in two chunks per week: Monday-Wednesday and Thursday-Sunday. Let’s look at a sample of how the first two hours of a week might start:

- **Watch a 5-minute video lecture** introduction to the Digital World of Personal Data
- **Answer a couple poll questions** about how many places you have “left digital information” in the last day. See what other students’ experiences are. (~3 min)
- **Write a few sentences** about where you are most concerned about “leaving data”, then spend a few minutes reading over what some of your fellow students said, maybe adding on to someone else’s ideas. (~10 min)
- **Do an interactive reading** on the variety of different ways we leave digital footprints (~40 min) (Note: our interactive reading system asks you to embed questions or comments directly in the reading and/or to respond to questions/comments from others -- it’s kind of like sitting together to read a chapter with a friend and stopping to discuss and clarify).
- **Take a 4 question quiz** on the reading (~8 min, but you can repeat until you get the score you want -- we suggest 100%)
- **Watch a 10-minute video lecture** on learning goals/standards for students K-12 around issues of Personal Data.
- **Find, describe, and critique a grade-appropriate resource** on an issue related to Personal Data (given some guidance) and submit a short summary as a googledoc. (~45 min)
- **Briefly review the submission of 2 other students** to develop your critiquing skills and learn about additional resources you might like to use when teaching. (~10 min)

As you can see, rather than the relatively bigger chunks of traditional courses (e.g. go to class, read the book, do homework, study for the test) this course has a lot of smaller and more diverse activities that guide your learning experience. We use a lot of online features to

- Break learning into smaller chunks
- Engage you more in thinking and discussing content with others
- Better integrate and more frequently test of your knowledge (with a focus on mastery, go back and learn what you missed then come test again)
- Give you practice in teaching-specific skills you will need as an educator (finding and evaluating online teaching resources, critiquing and modifying lesson plans).

In addition to the various weekly engagement and quiz activities, you will complete 5 projects -- one for each of the digital worlds we will study. Each of these will involve documenting your learning from this world (to use later in teaching) and reflecting on the effectiveness of your own learning and how various instructional activities supported or could better support that learning. For the final project in the course you will both complete the Advanced Placement Computer Science Principles Explore Task and apply the AP grading checklist and provide feedback to a fellow student on their response.

Overall, just like a normal upper-division UC course, **you should expect to spend about 12 hours per week on this course, plus a final project during exam week.**

****Note:** If you imagine an online course where you can sit down in a weekend and power through, this is not that course.