

ITLS 3350 Syllabus

Instructor

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Course Description

What is computational thinking? Computational thinking is a relatively new concept that involves understanding how humans use computers to think through problems, gather and analyze data, create tools for others to use, and, of course, code things. To do this we will need to develop some understanding of how humans have designed computers and the various software that control them. By the end of the course you should have a basic understanding of several areas of computational thinking, ideas encapsulated by fun words like: data, abstraction, algorithms, planning structures, user interface. You should also have an idea of 1) how those apply to your daily life (i.e., how you can apply computational thinking to regular everyday problems with and without computers; how computers affect your everyday life) as well as 2) how to apply these concepts to designing for others (with and without computers).

You do not need any prior programming or computer background before taking this course. The course has been designed for novices in those areas. That said, many of you may have months or years of experience in one or more coding languages or in thinking computationally (whether you know it or not). For this reason if you do not find Scratch as a programming platform challenging, you can *propose* another programming platform in which to fulfill coding assignments and co-design programming projects with the professor that will meet course requirements. This will take initiative on your part but will be much more interesting for you in the end.

A big portion of this course is built on supporting **choice and interest**. You can choose from *many* options in at least $\frac{1}{3}$ of the assignments. This will work best if you take ownership of your own learning and think about what topics interest you the most, what areas you lack expertise in, and what areas might link best to the scholarly and career directions you want to go. In addition, you can choose between three areas for the final project or paper: traditional research, design project, or education project.

If you find that you still aren't being challenged in the course, please talk to the professor about a proposal for a custom track that will allow you to go deeper into the general topics of the

course in a unique way. I am open to ideas and proposals if you take the time to meet with me and propose something.

The course is designed to be a steady workload of 8-9 hours a week as a 3-credit upper division undergraduate course. If you are investing that amount of time and struggling, please meet with the professor ASAP to figure out how to make things smoother for you. If you are not investing that amount of time on average every week, then that's on you.

Finally, this is the *first year* this course is being offered. It will not be perfect, and I hope that you will help me evaluate what is working best, what can be improved, and perhaps what new things I can add to next year's course. Your inputs in this area will 1) demonstrate high levels of reflection into learning and design and 2) make a difference for future students. In other words: help me debug this course, iterate on it, and revise it to be better.

Course Objectives

By the end of this course, you will be able to:

1. Explain the application of computational thinking across multiple domains.
2. Apply the foundational principles of computational thinking to frame a question and devise a solution in a particular field of study.
3. Understand and use the fundamental concepts of data types, such as control structures, functions, and arrays.
4. Demonstrate a fundamental understanding of software development methodologies, including modular design, pseudo code, flowcharting, structure charts, structured programming, and algorithmic design.
5. Identify the impacts of computing and information technology on humans and the importance of human-centered design, including understanding the differences between User Interface and User Experience (UI/UX).

Course Resources

All required texts and coding tools are free and listed in the course modules.

Course Requirements

Each student will:

1. Participate in weekly core assignments, including weekly participation in discussion boards.
2. "Choose your own adventure" in where to invest time and effort in choice-based assignment (Side Quests).

3. Complete a final project or paper. Final project/paper choice must be approved by the professor in advance.

NOTE: Projects, coding, reading, etc, are due **FRIDAYS** at midnight MT. Discussion posts and responses are due **TUESDAYS** at midnight MT. Remember these two weekly deadlines!

Evaluation Methods and Criteria

There are three major groupings of assignments in this course.

1. **Core Quest Requirements (35%).** These are assignments that everyone must complete, including various coded and "unplugged" projects, readings, reflections, and discussion boards.
2. **Side Quests (35%).** These are assignments that you get to choose from. You will need to get a certain number of "points" across the semester, but you can choose from a variety of assignments under different topics. This will allow you to invest more time in areas where you are more interested or want more experience.
3. **Final Boss Project/Paper (30%).** There are three choices for the final project or paper, all of which require instructor approval (via a personal conversation by phone or video):
 - 1) a traditional term paper on a topic of your choice, 2) a computational project that solves a community problem, or 3) an instructional unit about some aspect of computational thinking.

Course Schedule/Outline

Our course will proceed in groupings by topic:

Week 0: Level 0—Introductions

Weeks 1-2: Level 1—Computational Thinking

Weeks 3-5: Level 2—CT, Control Structures, & Pseudocode for Planning

Weeks 6-7: Level 3—Understanding Data Types

Weeks 8-10: Level 4—Software Design Methods

Weeks 11-12: Level 5—Human-Centered Design & UX/UI

Weeks 13-14: Final Boss Battle—Final project prep

Finals Week: Final project/paper due.

Grade Scheme

The following grading standards will be used in this class:

Grade	Range
A	100 % to 93.0%
A-	< 93.0 % to 90.0%
B+	< 90.0 % to 87.0%
B	< 87.0 % to 83.0%
B-	< 83.0 % to 80.0%
C+	< 80.0 % to 77.0%
C	< 77.0 % to 73.0%
C-	< 73.0 % to 70.0%
D+	< 70.0 % to 67.0%
D	< 67.0 % to 60.0%
F	< 59.0 % to 0.0%

Attendance and Excused Absences Policy

Throughout the term, you will be asked to participate in discussions and activities online. Students are *required* to post questions and comments on weekly discussion boards. Be thoughtful, ask questions, provide answers, really dig into the texts and ideas!

Your overall participation in the discussion boards and in short online activities will be considered when determining your level of participation at the end of the semester. Also, note that Canvas maintains automatic records of what resources you use on the website. Your use of online materials will be considered when determining your level of participation.

Learning is innately social. In an online class it can be difficult to develop the social connections that we take for granted in face-to-face courses. Thus participation in discussion boards,

comments on your peers' assignments, and other creative means that you find are tremendously important to your *own* as well as our class community's learning.

Late policy

In general late work is accepted with a 50% reduction in points (i.e., for half-credit). However, I often encourage revisions of work that may not meet your point-goals, especially early in the semester. If you have an emergency or situation that is affecting your coursework, please *reach out quickly* to let me know. You should do this with all of your professors so that we can figure out how to help and adjust as needed.

Library Services

All USU students attending classes in Logan, at our Regional Campuses, or online can access all databases, e-journals, and e-books regardless of location. Additionally, the library will mail printed books to students, at no charge to them. Students can also borrow books from any Utah academic library. Take advantage of all library services and learn more at libguides.usu.edu/rc.

Classroom Civility

Utah State University supports the principle of freedom of expression for both faculty and students. The University respects the rights of faculty to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede the learning process. Disruptive classroom behavior will not be tolerated. An individual engaging in such behavior may be subject to disciplinary action. Read [Student Code Article V Section V-3](#) for more information.

University Policies & Procedures

COVID-19 Classroom Protocols

In order to continue to provide a high standard of instruction at USU, and to limit the spread of COVID-19 during the pandemic, students are asked to follow certain classroom protocols during the fall 2020 semester. These protocols are in place not only for your safety but also the safety of the rest of the campus community. You will be asked to clean your desk area at the start of each class, sit in designated seats, wear face coverings, and follow dismissal instructions. There may be individual medical circumstances that prevent some students from using face coverings. These circumstances will be rare, but if they do exist, we ask that everyone be respectful. It is imperative that we each do our part so that on-campus instruction can continue.

Academic Freedom and Professional Responsibilities

Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in

learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility. [Faculty Code Policy #403](#) further defines academic freedom and professional responsibilities.

Academic Integrity – "The Honor System"

Each student has the right and duty to pursue his or her academic experience free of dishonesty. To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge:

"I pledge, on my honor, to conduct myself with the foremost level of academic integrity."

A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

Academic Dishonesty

The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the University's Student Code. Acts of academic dishonesty include but are not limited to:

- **Cheating:** using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity. Unauthorized assistance includes:
 - Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done "individually;"
 - Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
 - Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;
 - Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;
 - Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;

- Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.
- **Falsification:** altering or fabricating any information or citation in an academic exercise or activity.
- **Plagiarism:** representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

For additional information go to: [ARTICLE VI. University Regulations Regarding Academic Integrity](#)

Sexual Harassment/Title IX

Utah State University is committed to creating and maintaining an environment free from acts of sexual misconduct and discrimination and to fostering respect and dignity for all members of the USU community. Title IX and [USU Policy 339](#) address sexual harassment in the workplace and academic setting.

The university responds promptly upon learning of any form of possible discrimination or sexual misconduct. Any individual may contact USU's [Office of Equity](#) for available options and resources or clarification. The university has established a complaint procedure to handle all types of discrimination complaints, including sexual harassment ([USU Policy 305](#)), and has designated the Office of Equity Director/Title IX Coordinator as the official responsible for receiving and investigating complaints of sexual harassment.

Withdrawal Policy and "I" Grade Policy

Students are required to complete all courses for which they are registered by the end of the semester. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but not due to poor performance or to retain financial aid. The term 'extenuating' circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter a work schedule to secure employment, (4) change in work schedule as required by an employer, or (5) other emergencies deemed appropriate by the instructor.

Students with Disabilities

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the [Disability Resource Center \(DRC\)](#) as early in the semester as possible (University

Inn # 101, (435) 797-2444, drc@usu.edu). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

Students who are at a higher risk for complications from COVID-19 or who contract COVID-19 may also be eligible for accommodations.

Diversity Statement

Regardless of intent, careless or ill-informed remarks can be offensive and hurtful to others and detract from the learning climate. If you feel uncomfortable in a classroom due to offensive language or actions by an instructor or student(s) regarding ethnicity, gender, or sexual orientation, contact:

- Division of Student Affairs: <https://studentaffairs.usu.edu>, (435) 797-1712, studentservices@usu.edu, TSC 220
- Student Legal Services: <https://ususa.usu.edu/student-association/student-advocacy/legal-services>, (435) 797-2912, TSC 326,
- Access and Diversity: <http://accesscenter.usu.edu>, (435) 797-1728, access@usu.edu; TSC 315
- Multicultural Programs: <http://accesscenter.usu.edu/multiculture>, (435) 797-1728, TSC 315
- LGBTQA Programs: <http://accesscenter.usu.edu/lgbtqa>, (435) 797-1728, TSC 3145
- Provost's Office Diversity Resources: <https://www.usu.edu/provost/diversity>, (435) 797-8176

You can learn about your student rights by visiting:

The Code of Policies and Procedures for Students at Utah State University: <https://studentconduct.usu.edu/studentcode>

Grievance Process

Students who feel they have been unfairly treated may file a grievance through the channels and procedures described in the Student Code: [Article VII](#).

Full details for USU Academic Policies and Procedures can be found at:

- [Student Conduct](#)
- [Student Code](#)
- [Academic Integrity](#)
- [USU Selected Academic Policies and Procedures](#)

- [USU Academic Policies and Procedures](#)
- [Academic Freedom and Professional Responsibility Policy](#)

Emergency Procedures

In the case of a drill or real emergency, classes will be notified to evacuate the building by the sound of the fire/emergency alarm system or by a building representative. In the event of a disaster that may interfere with either notification, evacuate as the situation dictates (i.e., in an earthquake when shaking ceases or immediately when a fire is discovered). Turn off computers and take any personal items with you. Elevators should not be used; instead, use the closest stairs.

Mental Health

Mental health is critically important for the success of USU students. As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Utah State University provides free services for students to assist them with addressing these and other concerns. You can learn more about the broad range of confidential mental health services available on campus at [Counseling and Psychological Services \(CAPS\)](#).

Students are also encouraged to download the [“SafeUT App”](#) to their smartphones. The SafeUT application is a 24/7 statewide crisis text and tip service that provides real-time crisis intervention to students through texting and a confidential tip program that can help anyone with emotional crises, bullying, relationship problems, mental health, or suicide related issues.