# **See the source imageCSC 101: Introduction to Computer Science**

## Meeting Days, Times, and Location

## Semester: [XXXX], Year [XXXX]

## **Instructor Information**

Name: [include title, pronouns, and what you prefer to be called]

Contact Info: [include information of your preferred method of contact here]

Office Location:

Office Hours:

**Course Description**

We live in a digital society where computer-based technologies impact nearly every facet of our day-to-day lives. These technologies would not be possible without computer science. This course provides an introduction to computer science and will be of interest to both majors and non-majors who want to learn foundational concepts in the field, as well as common computer science applications. Centered around creative problem-solving and management of information, students will learn how to apply computational thinking to solve a variety of problems through hands-on projects. Topics include algorithms, writing code, data representation, information security, and artificial intelligence. After foundational concepts are covered, the course discusses common computer applications, their impact on society, and the ethical issues that arise from existing and emerging technologies.

**Learning Outcomes**

### Upon completing this course, students will be able to:

* Learning Outcome 1 (LO1): Understand **foundational concepts in computer science**, including algorithmic thinking, writing coding, data representation, information security, artificial intelligence, and ethical issues.
* Learning Outcome 2 (LO2): Apply **creative** **problem-solving** to solve computational problems in areas such as information security and artificial intelligence and apply computing principles for creative expression through code.
* Learning Outcome 3 (LO3): Use foundational skills in computer science to **create** an imaginative functional product.
* Learning Outcome 4 (LO4): Identify ethical issues in computer science and apply **ethical reasoning** to understand how decisions in computer science impact individuals and society.

Definitions of Creativity and Ethical Reasoning from Senate Bill 19/20-07:

**Creativity**

**Rationale:** Liberally educated students adapt and innovate in our rapidly changing world. Although creativity is often associated with the arts, innovative thought and expression are used across the disciplines and in various work situations. The capacity to see new possibilities and to make things that did not exist before is a valuable skill for various fields.

**Definition:** Creativity is the ability to utilize skills and strategies to synthesize ideas, perspectives, information, or materials in original and self-aware ways, and to use that synthesis to generate imaginative acts or products.

**Ethical Reasoning**

**Rationale:** Liberally educated students carefully consider how decisions and behaviors affect individuals, communities, and the world. In an increasingly complex and globalized society, it is imperative to contemplate the impact that human actions have on others and to recognize and weigh the ethical implications of different courses in life and work.

**Definition:** Ethical Reasoning requires students to recognize ethical issues, identify their own ethical positions and analyze other ethical perspectives in real-world situations in order to consider the impact of decisions and actions on other individuals, society, and the environment.

**High Impact Practices**

High Impact practices are shown to increase student efficacy and learning. These practices aim at helping students to apply what they are learning in academic and real-world contexts. This course embeds the high impact practices of **Collaborative Assignments and Projects**. Throughout the course, students will engage in group projects involving problem-solving through code and/or discussion and reflection of ethical issues in computer science.

**Learning Resources**

* Schneider and Gersting (2019), *Invitation to computer science*, 8th edition. Boston: Cengage Learning.
* <https://scratch.mit.edu/>
* https://code.visualstudio.com/docs/python/python-tutorial
* https://www.w3schools.com/python/

**Assessments**

The final course grade will be calculated using the following assessments:

|  |  |
| --- | --- |
| **Assessment** | **Percentage of final grade** |
| Participation / Discussion | 20% |
| Assignments | 40% |
| Projects | 40% |

**Participation / Discussion:** Participation is worth 20% of your grade and is based on the quality of your participation and not just the quality. Attendance is required (see attendance policy below). Participation is demonstrated through contributions to class discussions (both inside and outside of class), asking questions in class or during office hours, and answering questions in class. All students will also be required to leave feedback on class presentations.

**Assignments:** Assignments will be given to assess your understanding of course content and your ability to apply course concepts to solve computational problems. This course content covers the basic competencies that are necessary for **creativity** in Computer Science. Some assignments will also cover **ethical reasoning** and will assess your ability to recognize ethical issues and to understand the impact that decisions in Computer Science have on other individuals and on society. Some of these assignment questions will come from the textbook. The format of these questions may vary and may require short answers or writing code. Some class time will be set aside for completion of these assignments.

**Projects:** There will be three group projects during the semester. These projects will be larger assignments and may involve problem-solving or writing code. Projects may include a brief demonstration of and description of code, and/or a formal presentation. The specific projects are described briefly below. More details will be provided at a later date.

Scratch Project – You will use Scratch, a visual programming language, to solve a problem or to construct an animation or game. This project will be evaluated based on your demonstrated **creativity**, and requires the application of basic coding competencies and innovative thinking in order to create an imaginative product in the form of functional software.

Information Security Project – You will write code to either (a) implement a simple encryption algorithm, or (b) create a stenographic image (an image with a hidden message). This project will also be evaluated based on your demonstrated **creativity**, and requires the application of basic coding and cybersecurity competencies and innovative thinking to create an imaginative product. Your solution is expected to be original and to include unconventional solutions to information security problems.

Ethics Project – You will identify a current ethical issue in computer science, summarize the topic, and apply **ethical reasoning** to describe the implications of the topic on individuals and society. Your project must include an awareness and an evaluation of at least 2 ethical positions related to your issue.

Students will be assigned the following final letter grades, based on the calculations coming from the course assessment section.

|  |  |
| --- | --- |
| **Grade** | **Percentage Interval** |
| A | 94 – 100% |
| A- | 90 – 93 |
| B+ | 87 – 89 |
| B | 83 – 86 |
| B- | 80 – 82 |
| C+ | 77 – 79 |
| C | 73 – 76 |
| C- | 70 – 72 |
| D+ | 65 – 69 |
| D | 60 – 64 |
| F | < 60 |

### **Grading Policies**

**Late Work Policy:** Students are expected to turn in all assignments on the day they are due. This is integral toprofessional practices for nearly all disciplines, but is critical in a field based heavily on milestones andstages of development. Late work is accepted, but with a penalty of 20 percentage points foreach day after the original deadline date, unless a documented justification can be provided.

If at any time someone is having difficulty meeting any of these deadlines, prior notification is required and new terms may be established, depending on the circumstances causing the issue. While I try to uphold strict standards to deadlines being met, I understand life can, and does happen.

**Attendance and/or participation policy**: Attendance and participation in every class is expected and essential to your success in this course and so is interacting with your fellow students. As a result, in class projects and assignments are impossible to make up.

**Three unexcused absences will result in a loss of an entire letter grade.**

Each additional unexcused absence will reduce this one full letter further. This will be applied

after your semester average has been totaled. If you are unable to attend a class, an email with a brief explanation is required. If there is a factor (illness for example) that is making attending class for a period of time difficult, please talk to me so arrangements can be made, if appropriate.

### **Course and University Policies and Resources**

**Class Cancellation Policies**: In the event of a cancellation on my part, I will both email and make an announcement on Blackboard.

**Academic Integrity**: Students are responsible for familiarizing themselves with the University’s numerous policies and procedures contained in the University Catalog and Student Handbook. The Code of Conduct policies and the Policy on Academic Misconduct are of special significance, since cheating, plagiarism, and personal misconduct are strictly prohibited and carry severe penalties. Students should read and understand Eastern's Academic Misconduct Policy, which can be found in the student handbook: <https://easternct.makekb.com/entry/307/>. All violations will be handled under the procedures established in this policy.

**Academic Success Center**: Students are encouraged to use the support offered by the Academic Services Center (ASC) located on the ground floor of the Library. Advising Services and tutoring in math, writing, and other subjects, including supplementary instruction, are available. The ASC also offers Peer Academic Coaching (PAC) assistance with study techniques, time management, “Eastern in 4” planning and understanding learning styles. For further information about our services, please call 465-4625 or check the ASC website at <http://www.easternct.edu/asc/>.

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**Accommodations for Students with Disabilities:** Eastern Connecticut State University is committed to following the requirements of the Americans with Disabilities Act (ADA) of 1990, the ADA Amendment Act of 2008, and Section 504 of the Rehabilitation Act of 1973, as amended in 1998. If you are a student with a disability and are in need of accommodations or assistance evacuating a building in the case of an emergency, please contact the Office of AccessAbility Services (OAS) at 860-465-0189 or [AccessAbility@easternct.edu](mailto:AccessAbility@easternct.edu). Please note that accommodations are not retroactive and must be communicated to faculty members through a Letter of Accommodations, which is drafted by the OAS.

**Final Examination Statement:** University policy states that, “No examination shall be given during the final week of scheduled classes of a full semester course.” Faculty must receive prior approval from the Vice-President of Academic Affairs in order to schedule an examination during the final week of classes. Faculty may, with approval from the Vice-President of Academic Affairs in consultation with the Academic Dean and Registrar, hold a single exam session for all sections of the same course. Students will be notified of the exam date, time, and place on the course syllabus.

**Student Sexual Misconduct Statement:** Title IX of the Education Amendment of 1972, as well as the Board of Regents Policy on Sexual Misconduct Reporting, Support Services and Processes, prohibit acts of sexual misconduct – sexual harassment, sexual assault, sex-based discrimination, dating violence, domestic violence, stalking, and inappropriate relationships between employees and students. If you or someone you know has been or experiences harassment or assault, resources are available with the Sexual Assault & Interpersonal Violence Response Team (SAIV-RT). Alleged violations can be reported to the Title IX Coordinator in the Office of Equity and Diversity at 860-465-5791. Reports to law enforcement can be made to Eastern Connecticut State University Police Department at 860-465-5310. To receive support and advocacy, please contact the Coordinator of the Sexual Assault & Interpersonal Violence Response Team (SAIV-RT) at 860-465-4314. You may also visit the SAIV-RT website at [SAIV-RT Response Protocol - Eastern (easternct.edu)](https://www.easternct.edu/sexual-assault-and-interpersonal-violence/about-saiv-rt/response.html) for more information including a list of confidential resources.

**Statement on Student Wellness:** Eastern Connecticut State University faculty and staff recognize that mental health concerns can impact academic performance and interfere with daily life activities. Please notify your faculty member or academic advisor for academic assistance, as needed. Counseling and Psychological Services (CAPS) can also provide support if you’re feeling stressed, overwhelmed, anxious, depressed, lost or are struggling with other personal issues.

Please call or visit the Counseling and Psychological Services (CAPS) website for more information. These professional services are free, confidential, and support non-traditional, graduate, and undergraduate students. Call 860-465-0181 to schedule an appointment. Same day urgent hours are M-F, 1-3.

Students in crisis and/or experiencing suicidal thoughts, free 24/7 crisis support in the US, call:

Suicide & Crisis Lifeline at 9-8-8

Suicide Prevention Lifeline at 1-800-273-8255

Text HOME to the Crisis Text Line at 741 741

Trevor Project 1-866-488-7386 for LGBTQ youth

211 (mental health emergency)

**Writing Assistance:** The Writing Center is a really great thing. Located on the first floor of the library, the Writing Center is staffed with trained undergraduate peer tutors who can help you at all stages of the writing process, for any class. If you’re having trouble coming up with an idea for a paper, or don’t understand an assignment, or simply want a “second set of eyes” for your paper to “see if it flows,” go to the Writing Center. Appointments are recommended, especially around midterms and finals—you can make those online using Insight. It’s best to bring a copy of the assignment with you when you go to the Writing Center and do expect to participate in your session—the Writing Center’s not a proofreading or editing service, though tutors will show you how to do those things on your own.

### **Tentative Course Schedule**

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| --- | --- | --- | --- |
| **Date** | **Theme/Topic** | **Learning Outcomes Addressed** | **Readings/Assignments Due** |
| Week 1 | Introduction to Computer Science | LO1 | Chapter 1 |
| Week 2 | Algorithmic Discovery & Design | LO1, LO2 | Chapter 2 |
| Week 3 | Programming with Scratch | LO1, LO2, LO3 | Selected Scratch tutorials (https://scratch.mit.edu/help/videos/) |
| Week 4 | Programming with Scratch (con’t) | LO1, LO2, LO3 | Selected Scratch tutorials (https://scratch.mit.edu/help/videos/) |
| Week 5 | **Scratch Project** | LO1, LO2, LO3 |  |
| Week 6 | Programming with Python | LO1, LO2 | https://www.w3schools.com/python/ |
| Week 7 | Programming with Python (con’t) | LO1, LO2 | https://www.w3schools.com/python/ |
| Week 8 | Binary Representation of Data (Numbers, Text, Images, and Audio) | LO1 | Chapter 4 (sections 4.1 – 4.24) |
| Week 9 | Information Security | LO1, LO2 | Chapter 8 |
| Week 10 | **Information Security Project** | LO1, LO2, LO3 | Chapter 8 |
| Week 11 | Electronic Commerce, Databases, and Personal Privacy | LO1 | Chapter 14 |
| Week 12 | Artificial Intelligence | LO1, LO2 | Chapter 15 |
| Week 13 | Artificial Intelligence (con’t) | LO1, LO2 | Chapter 15 |
| Week 14 | Ethical Questions in Computer Science | LO1, LO4 | Chapter 17 |
| Week 15 | **Ethics Project** | LO1, LO4 | Chapter 17 |