



Fall 2021

CSCI-1

Introduction to Computer Science

Syllabus

Instructor: Simon Sultana, Ph.D.

Department: Computer Science

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Response time: < 24 hours

Office Hours: Tuesday 1-2pm (Zoom), Thurs 3pm-4pm (FEM-4a), or by appt

Section Number: 57141

Unit(s): 3

Dates: 8/9/2021 – 12/7/2021

Class Meeting: Thursday 1-2:50pm

Location: Hybrid: On Campus/Zoom

Classroom: FEM-3/Zoom

<https://scccd.zoom.us/j/92545802190?pwd=bFhDdWR3Zjc4ODFSQ0FNbjFDVjY80UT09>

Prerequisites: MATH 103 – Intermediate Algebra

Advisory: ENGL-125 – Writing Skills for College and ENGL-126 Reading Skills for College

Course Description: This course is an introduction to computer science with emphases on critical thinking skills and programming concepts. Topics include deductive reasoning, social and ethical implications, computer hardware and software, programming concepts and methodology. The course is designed to prepare students with little or no programming experience for Computer Science 40.

Note: this course is offered in a hybrid format. There will be a recorded lecture available at the beginning of the week. Students are expected to work on zyBooks activities before our class meeting on Thursday. The meeting will be used to work on class activities in small teams. The Thursday meeting is offered in a two-way interactive format, meaning that students have the choice of joining the Thursday meeting at 1pm on campus or via Zoom. Please note that live attendance is required each week (in person or online). It is up to each student how they would like to attend each week. Note we will be working on labs in small groups and we will combine students who are in person and online. **Note also that students are required to attend the midterm exam (Thursday, October 14, 2021) and the final exam (Tuesday, December 6, 2021) on campus.** Please let me know if you have any questions.

Course Goals and Student Learning Outcomes:

Upon completion of this course, students will be able to:

- 🔥 Apply critical thinking skills in solving problems.
- 🔥 Carry out computer-related tasks with professional ethics.
- 🔥 Demonstrate understanding of computer-related topics through writing.
- 🔥 Solve simple mathematical problems (such as addition, subtraction, multiplication and division) using computers.
- 🔥 Use pseudocode or a programming language to implement, test, and debug algorithms for solving simple problems.

Objectives:

In the process of completing this course, students will:

- 🔥 Apply critical thinking skills to the design and development of algorithms and programs.
- 🔥 Avoid common fallacies of reasoning.

- 🔥 Demonstrate the knowledge of professional ethics and responsibilities.
- 🔥 Determine argument validity.
- 🔥 Develop programming flowchart and pseudo code.
- 🔥 Distinguish between deductive and inductive arguments.
- 🔥 Recognize the impact of computers on privacy issues.
- 🔥 Recognize the logical structure of sentences.
- 🔥 Summarize the history of computing.
- 🔥 Understand government policy on encryption.
- 🔥 Understand machine architecture.
- 🔥 Understand protection of intellectual property.
- 🔥 Use condition and repetition programming structures.
- 🔥 Write simple sequential programs.

Student Learning Outcomes are statements about what the discipline faculty hope you will be able to do at the end of the course. This is NOT a guarantee: the ultimate responsibility for whether you will be able to do these things lies with you, the student. In addition, the assessment of Student Learning Outcomes is done by the department in order to evaluate the program as a whole, and not to evaluate individual faculty performance.

Required or Recommended Textbooks and Materials:

Textbooks:

Required: zyBooks, register and connect via Canvas before first meeting (cost: \$58).

1. Click on your zyBooks link in your learning management system
(Do **not** go to the zyBooks website and create a new account)
2. Subscribe

Optional Supplemental Textbooks:

Computer Science: An Overview, 13th Ed., by J. Glenn Brookshear & Dennis Brylow, Pearson
An Invitation to Computer Science, 8th Ed., by Michael Schneider & Judith Gersting, Cengage

These optional texts are not necessary but will be good supplementary resources for those interested. Older versions are useful.

Learning Management System: CANVAS:

Canvas (<https://sccd.instructure.com/>) is used to post announcements, course information, programming assignments, and grade. You will submit your programming assignments on Canvas. To log-in Reedley College CANVAS:

Username: Your 7-digit student ID number.

Password: If you have not previously changed your password, it is:

First name initial (upper case) + *last name initial* (lowercase) + *date of birth* (mmddyy)
Example: John Smith born on July 9th of 1988 Password = Js070988

Computer Lab:

Scratch (scratch.mit.edu), repl.it, Notepad++, Python IDLE 3.9, Thonny, Microsoft Office/Google Sheets are used for this class.

Topics:

- A. Social Issues and Professional Practice (SP)
 - a. Social Context (3 hours)
 - i. Social implications of computing
 - ii. Impact of social media
 - iii. Growth and control of the Internet
 - iv. Digital divide
 - b. Analytical Tools (0.5 hour)
 - i. Ethical argumentation
 - ii. Stakeholder analysis
 - c. Professional Ethics (1.5 hours)
 - i. Professionalism
 - ii. Codes of ethics
 - iii. Accountability, responsibility, and liability
 - iv. Maintaining awareness of consequences
 - d. Intellectual Property (0.5 hour)
 - i. Digital rights management
 - ii. Software piracy
 - e. Privacy (2 hours)
 - i. Implications of widespread data collection
 - f. Professional Communication (1.5 hours)
 - i. Reading, understanding, and summarizing technical material
 - ii. Writing effective technical documentation and materials
 - iii. Dynamics of oral, written, and electronic team and group communication
 - iv. Utilizing collaboration tools
 - g. History (2 hours)
 - i. History of computer hardware, software, networking
 - ii. Pioneers of computing
 - iii. History of the Internet
- B. Architecture and Organization (AR)
 - a. Digital Logic and Digital systems (0.5 hour)
 - i. Overview of computer architecture
 - ii. Multiple representations/layers of interpretation
 - b. Machine Level Representation of Data (1 hour)
 - i. Bits, bytes, and words
 - ii. Numeric data representation and number bases
 - iii. Representation of non-numeric data
 - c. Assembly Level Machine Organization (1 hour)
 - i. Basic organization of the von Neumann machine
 - ii. Assembly/machine language programming
 - d. Memory System Organization and Architecture (0.5 hour)
 - i. Storage systems and their technology
 - ii. Main memory organization and operations
- C. Information Assurance and Security (IAS)
 - a. Foundational Concepts in Security (0.5 hour)
 - i. Concepts of risk, threats, vulnerabilities, and attack vectors
 - ii. Authentication and authorization, access control
 - iii. Concept of trust and trustworthiness

- b. Threats and Attacks (0.5 hour)
 - i. Examples of malware
 - ii. Denial of Service (DoS) and Distributed Denial of Service (DDoS)
 - c. Network Security (0.5 hour)
 - i. Network specific threats and attack types
 - ii. Use of cryptography for data and network security
 - d. Cryptography (1.5 hour)
 - i. Mathematical preliminaries
 - ii. Cryptographic primitives
 - iii. Symmetric key cryptography
 - iv. Public key cryptography
 - e. Information Management Concepts (0.5 hour)
 - i. Information systems as socio-technical systems
 - ii. Basic information storage and retrieval concepts
 - f. Database Systems (0.5 hour)
 - i. Approaches to and evolution of database systems
 - ii. Components of database systems
- D. Operating Systems (OS)
- a. Overview of Operating Systems (2 hours)
 - i. Role and purpose of the operating system
 - ii. Functionality of a typical operating system
- E. Programming Languages (PL)
- a. Introduction (1 hour)
- F. Software Development Fundamentals
- a. Algorithms and Design (4 hours)
 - i. The concept and properties of algorithms
 - ii. The role of algorithms in the problem-solving process
 - b. Fundamental Programming Concepts (12 hours)
 - i. Basic syntax and semantics of a higher-level language
 - ii. Variables and primitive data types
 - iii. Expressions and assignments
 - iv. Conditional and iterative control structures

Tentative Schedule:

	Assignment Points	Date
Week 1: Intro to Computer Science & Algorithms	32	8/9/2021
Read Seven Big Ideas of Computer Science		
zyBooks Participation Activities	7	8/13/2021
Lecture Video Available		8/10/2021
Class Meeting		8/12/2021
Class Activity: PBJ Challenge	10	8/13/2021
Schedule One-on-One	15	8/15/2021
Week 2: More on Algorithms	39	8/16/2021
zyBooks Participation Activities	14	8/20/2021
Lecture Video Available		8/17/2021
Class Meeting		8/19/2021

Class Activity: Algorithms	10	8/20/2021
Week 1 & 2 zyBooks Challenge Activities	15	8/22/2021
Week 3: Computer Science History, Numbering Systems	36	8/23/2021
zyBooks Participation Activities	6	8/26/2021
Lecture Video Available		8/24/2021
Class Meeting		8/26/2021
Class Activity: Bits Bytes	10	8/27/2021
Project 1a: Flowchart/Pseudocode of Scratch Project	20	8/29/2021
Week 4: Computer Hardware	18	8/30/2021
zyBooks Participation Activities	8	9/2/2021
Lecture Video Available		8/31/2021
Class Meeting		9/2/2021
Class Activity: Hardware	10	9/2/2021
Week 5: Operating Systems	54	9/6/2021
zyBooks Participation Activities	4	9/9/2021
Lecture Video Available		9/7/2021
Class Meeting		9/9/2021
Class Activity: Operating Systems	10	9/10/2021
Project 1b: Scratch Project	40	9/12/2021
Week 6: The Internet and Web	58	9/13/2021
zyBooks Participation Activities	8	9/16/2021
Lecture Video Available		9/14/2021
Class Meeting		9/16/2021
Class Activity: Internet	10	9/17/2021
Project 2: Basic Website	40	10/10/2021
Week 7: Privacy	15	9/20/2021
zyBooks Participation Activities	5	9/23/2021
Lecture Video Available		9/21/2021
Class Meeting		9/23/2021
Class Activity: Privacy	10	9/24/2021
Week 8: Data & Information Security	17	9/27/2021
zyBooks Participation Activities	7	9/30/2021
Lecture Video Available		9/28/2021
Class Meeting		9/30/2021
Class Activity: Encryption	10	10/1/2021
Week 9: Societal Impact & Ethics	19	10/4/2021
zyBooks Participation Activities	9	10/7/2021
Lecture Video Available		10/5/2021
Class Meeting		10/7/2021
Class Activity: Copyright and Open Source	10	10/8/2021
Week 10: Midterm Exam	50	10/11/2021
Optional Questions & Answers Session		10/12/2021
Midterm Exam @ 1pm	50	10/14/2021
Week 11: Application Software	49	10/18/2021
zyBooks Participation Activities	9	10/21/2021
Lecture Video Available		10/19/2021

Class Meeting		10/21/2021
Class Activity: Copyright and Open Source	10	10/22/2021
Project 3: Spreadsheet Data Analysis	30	10/31/2021
Week 12: Logic and Deductive Reasoning	14	10/25/2021
zyBooks Participation Activities	4	10/28/2021
Lecture Video Available		10/26/2021
Class Meeting		10/28/2021
Class Activity: Reasoning	10	10/29/2021
Week 13: Introduction to Python	13	11/1/2021
zyBooks Participation Activities	3	11/4/2021
Lecture Video Available		11/2/2021
Class Meeting		11/4/2021
Class Activity: Intro to Python	10	11/5/2021
Week 14: Python Arithmetic Expressions & Data Types	38	11/8/2021
zyBooks Participation Activities	8	11/12/2021
Lecture Video Available		11/9/2021
No Class Meeting - Veteran's Day Holiday		11/11/2021
Class Activity: Expressions, Data Types	10	11/14/2021
zyBooks Challenge Activities	20	11/14/2021
Week 15: Branching	39	11/15/2021
zyBooks Participation Activities	9	11/18/2021
Lecture Video Available		11/16/2021
Class Meeting		11/18/2021
Class Activity: Conditionals	10	11/19/2021
Project 4a: Design for Python Project	20	11/21/2021
Week 16: Loops	47	11/22/2021
zyBooks Participation Activities	7	11/27/2021
Lecture Video Available		11/23/2021
No Class Meeting - Thanksgiving Day		11/25/2021
Class Activity: Loops	10	11/29/2021
zyBooks Challenge Activities	30	11/29/2021
Week 17: Programming Languages & Software Development	4	11/29/2021
zyBooks Participation Activities	4	12/2/2021
Lecture Video Available		11/29/2021
Class Meeting		12/1/2021
Class Activity: Languages (lowest dropped)	-	12/3/2021
Week 18: Finals Week	158	12/6/2021
Professionalism	33	
Project 4b: Python Project	50	12/6/2021
Final Exam @ 1pm	75	12/7/2021
TOTAL	700	

Subject to Change:

This syllabus and schedule are subject to change. If a student is absent from class meeting, it is the student's responsibility to check on any changes made while you were absent.

Evaluation:

Students will be evaluated on the basis of their performance on various assignments according to the following scale. The instructor reserves the right to adjust scores as it may be required throughout the semester.

Points in the course total 700 and are distributed as follows:

zyBooks participation activities	112
Class activities	150
zyBooks challenge activities	65
Exams	125
Projects	200
Professionalism, 1:1 Meeting	48

Final grade is assigned using following scale:

630-700 points	A
560-629 points	B
490-559 points	C
420-489 points	D
< 420 points	F

Attendance

Attendance for onsite and synchronous online meetings will be taken at beginning of each class. Students who leave before the end of class will be marked tardy. For synchronous online meetings you are expected to have your camera turned on and will have the best experience if you use earbuds/headphones. Please make sure to stay muted until you have a question or something to add so as to cut down on background noise.

Students will be dropped from the class if they fail to attend the first class session of the semester. During the semester up to final drop date, any student who missed two weeks of class meetings (cumulative) will be dropped from this class (i.e. 4 classes).

Make-up tests are limited to students who have made arrangements with the instructor **prior** to the announced testing date or those students who have been excused by High School Attendance Office. Exam material is constructed from class discussions, assigned readings, guest lectures, video presentations, and special assignments. **Unless the student receives prior approval from the instructor, no make-up tests will be allowed.**

Grading Policy

zyBooks Participation Activities:

ZyBooks participation activities must be completed before announced due date (Friday for full credit). These activities allow you to actively engage each week's content. Points will be attributed according to the number of responses required and the percentage of the activities a student completes before class. Reference the following rubric:

Percentage Completed	Before Class Meeting Points Awarded	After Class by End of Week Points Awarded
90%+	100% of points	90% of points
80%+	90% of points	80% of points
70%+	80% of points	70% of points
60%+	70% of points	60% of points
50%+	60% of points	50% of points
25%+	40% of points	30% of points
13%+	20% of points	10% of points

These assignments are linked electronically in Canvas.

zyBooks Challenge Activities:

Three assignments in the course are made up of zyBooks challenge activities, which are distributed in the assigned zyBooks chapters. These activities assess learning of content and students have unlimited attempts to get correct answers. These assignments are linked electronically in Canvas.

Class Activities:

Class activities serve as the lab component of the class. Students will work in pairs or small groups and should usually be able to complete the lab assignment at end of the two-hour lab period. If groups need more time, the lab can be completed outside of the meeting time and are due on Thursdays. Turn in the lab assignment on LMS-Canvas. Submit any programs as .py files.

Projects:

There will be four projects that will be completed outside the class sessions. The projects are focused on the topics of algorithms (Scratch), web development (Basic website), data analysis (Spreadsheet), and programming (Python). All but the latter projects are individual. Students will work on the Python programming projects in pairs and complete a peer evaluation.

Exams:

Exams will be administered during class meeting time in weeks 10 (covers weeks 1-9) and 18 (cumulative, with some emphasis on weeks 11-18). A more difficult late test can only be arranged if you have an excuse verified and request before the exam is administered.

Late Policy

Points will be deducted for late zyBooks challenge activities at 5% per day late, up to one week late (not excepted more than one week late). zyBooks challenge activities are to be submitted electronically from the zyBooks site. Class activities and projects will not be accepted late.

College Policies:

Cheating & Plagiarism, see Cheating and Plagiarism under Campus Policies

Cheating and plagiarism is prohibited in the class. Incidents of cheating and plagiarism will result a failing grade on the particular assignment in question. Please see Student Conduct Standards at <https://www.reedleycollege.edu/about/about-us/policies-and-procedures/student%20conduct%20standards.html> for more information about academic integrity.

Each student is expected to assist in the overall environment of the classroom making it conducive to learning.

Accommodations for Students with Disabilities

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact the Reedley College Disabled Students Programs & Services (DSP&S) Department at (559) 638-0332. You can find more information at <https://www.reedleycollege.edu/student-services/disabled-student-programs-and-services/index.html>.

Reedley College is committed to creating accessible learning environments consistent with federal and state law. To obtain academic adjustments or auxiliary aids, students must be registered with the DSP&S office on campus. DSP&S can be reached at (559) 638-3332. If you are already

registered with the DSP&S office, please provide your Notice of Accommodation form as soon as possible.

Important College Dates Fall 2021

Class begin	Monday	08/09/2021
Last day to drop a full-term class for a full refund	Friday	08/20/2021
Last day to register	Friday	08/27/2021
Last day to drop this class to avoid a "W" in person	Friday	08/27/2021
Last day to drop this class to avoid a "W" on Web	Sunday	08/29/2021
Last date to drop this class	Friday	10/08/2021
No classes, campus is closed		
Labor Day	Monday	09/06/2021
Veterans Day	Thursday	11/11/2021
Thanksgiving Day	Thurs-Fri	11/25-26/2021
Final Exam	Monday	12/07/2021