



Spring 2023

CSCI-1

Introduction to Computer Science

Syllabus

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Department: Computer Science

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Response time: < 24 hours

Office Hours: Tues,Thurs 10am-12pm, Wed 10am-1pm (PHY-81), or by appt

Section Number: 50743

Unit(s): 3

Dates: 1/8/2023 – 5/17/2023

Class Meeting: Wednesday 1-3:20pm

Location: Hybrid: On Campus/Zoom

Classroom: PHY-82/Zoom

<https://scccd.zoom.us/j/92545802190?pwd=bFhDdWR3Zjc4ODFSQ0FNrjFDVy80UT09>

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 for computer science majors and nonmajors. PREREQUISITE: Mathematics 103 or equivalent. ADVISORY: English 1A or English 1AH. (A, CSU, UC).

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, where we work on class activities in small teams. Class time is offered in a two-way interactive format, meaning that students have the choice of joining 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 (Wednesday, March 9, 2023) and the final exam (Wednesday, May 17, 2023) 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:

- 🔥 Demonstrate critical thinking and reasoning skills to solve problems.
- 🔥 Develop small computer projects to meet requirements.
- 🔥 Write computer programs using fundamentals, including basic data types and control structures, to implement an algorithm.
- 🔥 Demonstrate teamwork and interpersonal group skills.

Objectives:

In the process of completing this course, students will:

- 🔥 Describe the organization of computer systems and networks, including hardware architecture and systems software
- 🔥 Briefly review major developments in the history of computer science
- 🔥 Use condition and repetition programming structures

- 🔥 Explain forms of protection of intellectual property
- 🔥 Develop flowcharts or pseudocode to implement simple algorithms
- 🔥 Describe efforts to ensure data and information security
- 🔥 Write simple sequential programs
- 🔥 Demonstrate knowledge of professional ethics and responsibilities
- 🔥 Explain the impact of computer technology on privacy
- 🔥 Determine logical argument validity
- 🔥 Describe processes and practices in software engineering

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:

- 1) 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

- 2) How to Think Like a Computer Scientist Registration (free resource) – instructions in Canvas

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://scccd.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	26	1/9/2023
zyBooks Participation Activities	6	1/13/2023
Lecture Video Available		1/9/2023
Class Meeting		1/11/2023
Class Activity: PBJ Challenge	10	1/15/2023
Schedule One-on-One	10	1/15/2023
Week 2: More on Algorithms	30	1/16/2023
Read Seven Big Ideas of Computer Science		
zyBooks Participation Activities	20	1/20/2023
Lecture Video Available		1/16/2023
Class Meeting		1/18/2023
Class Activity: Algorithms	10	1/22/2023
Week 3: Pseudocode and Flowcharts	42	1/23/2023

zyBooks Participation Activities	17	1/25/2023
Lecture Video Available		1/23/2023
Class Meeting		1/25/2023
Class Activity: Pseudocode and Flowcharts	10	1/29/2023
Week 1-3 zyBooks Challenge Activities	15	1/29/2023
Week 4: Computer Science History, Numbering Systems	41	1/30/2023
zyBooks Participation Activities	6	2/1/2023
Lecture Video Available		1/30/2023
Class Meeting		2/1/2023
Class Activity: Bits Bytes	10	2/5/2023
Project 1a: Flowchart/Pseudocode of Scratch Project	25	2/5/2023
Week 5: Computer Hardware	52	2/6/2023
zyBooks Participation Activities	12	2/8/2023
Lecture Video Available		2/6/2023
Class Meeting		2/8/2023
Class Activity: Hardware	10	2/12/2023
Project 1b: Scratch Project	30	2/19/2023
Week 6: Operating Systems	15	2/13/2023
zyBooks Participation Activities	5	2/15/2023
Lecture Video Available		2/13/2023
Class Meeting		2/15/2023
Class Activity: Operating Systems	10	2/19/2023
Week 7: The Internet and Web	21	2/20/2023
zyBooks Participation Activities	11	2/22/2023
Lecture Video Available		2/20/2023
Class Meeting		2/22/2023
Class Activity: Internet	10	2/26/2023
Week 8: Privacy & Web Programming	17	2/27/2023
zyBooks Participation Activities	7	3/1/2023
Lecture Video Available		2/27/2023
Class Meeting		3/1/2023
Class Activity: Privacy	10	3/5/2023
Week 9: Midterm Exam	100	3/6/2023
Optional Questions & Answers Session		3/7/2023
Midterm Exam	100	3/9/2023
Week 10: Data & Information Security	69	3/13/2023
zyBooks Participation Activities	9	3/15/2023
Lecture Video Available		3/13/2023
Class Meeting		3/15/2023
Class Activity: Encryption	10	3/19/2023
Project 2: Basic Website	50	3/19/2023
Week 11: Societal Impact & Ethics	23	3/20/2023
zyBooks Participation Activities	13	3/22/2023
Lecture Video Available		3/20/2023
Class Meeting		3/22/2023
Class Activity: Copyright and Open Source	10	3/26/2023

Week 12: Logic and Deductive Reasoning	40	3/27/2023
Lecture Video Available		3/27/2023
Class Meeting		3/29/2023
Class Activity: Logic & Reasoning	10	4/2/2023
Logic & Reasoning Activity: Fallacies	10	4/10/2023
Project 3: Logic and Reasoning Paper	20	4/10/2023
Spring Recess April 3 - 7		
Week 13: Introduction to Python	27	4/10/2023
How to Think Like a Computer Scientist Reading	9	4/12/2023
Lecture Video Available		4/10/2023
Class Meeting		4/12/2023
Class Activity: Intro to Python	10	4/16/2023
How to Think Like a Computer Scientist Problem Set	8	4/16/2023
Week 14: Python Arithmetic Expressions & Data Types	38	4/17/2023
How to Think Like a Computer Scientist Reading	14	4/19/2023
Lecture Video Available		4/17/2023
Class Meeting		4/19/2023
Class Activity: Expressions, Data Types	10	4/23/2023
How to Think Like a Computer Scientist Problem Set	14	4/23/2023
Week 15 Branching	64	4/24/2023
How to Think Like a Computer Scientist Reading	9	4/26/2023
Lecture Video Available		4/24/2023
Class Meeting		4/26/2023
Class Activity: Conditionals	10	4/30/2023
How to Think Like a Computer Scientist Problem Set	20	4/30/2023
Project 3a: Design for Python Project	25	4/30/2023
Week 16: Loops	32	5/1/2023
How to Think Like a Computer Scientist Reading	10	5/3/2023
Lecture Video Available		5/1/2023
Class Meeting		5/3/2023
Class Activity: Loops	10	5/7/2023
How to Think Like a Computer Scientist Problem Set	12	5/7/2023
Week 17: Programming Languages & Software Development	54	5/8/2023
zyBooks Participation Activities	4	5/10/2023
Lecture Video Available		5/8/2023
Class Meeting		5/10/2023
Class Activity: Languages (lowest dropped)	-	5/12/2023
Project 3b: Python Project	50	5/12/2023
Week 18: Finals Week	109	5/15/2023
Professionalism	9	
Final Exam 1pm	100	5/18/2023
TOTAL	800	

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 800 and are distributed as follows:

zyBooks participation activities	152
Class activities	150
zyBooks challenge activities	79
Exams	200
Projects	200
Professionalism, 1:1 Meeting	19

Final grade is assigned using following scale:

716+ points	A
636 – 715 points	B
556 – 635 points	C
476 – 555 points	D
< 476 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 meeting 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 planned 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 (Thursday 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 Sundays. 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), logic and reasoning (fallacy essay) and programming (Python). All but the last projects are individual. Students will work on the Python programming projects in pairs and complete a peer evaluation. Rubrics are presented in Canvas.

Exams:

Exams will be administered during class meeting time in weeks 10 (covers weeks 1-8) and 18 (cumulative, with some emphasis on weeks 10-17). A specifically designed alternate 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 Spring 2023

Class begin	Monday	01/09/2023
Last day to drop a full-term class for a full refund	Friday	01/20/2023
Last day to register	Friday	01/27/2023
Last day to drop this class to avoid a “W” in person	Friday	01/27/2023
Last day to drop this class to avoid a “W” online	Sunday	01/29/2023
Last date to drop this class	Friday	03/10/2023
No classes, campus is closed		
Martin Luther King, Jr. Day	Monday	01/16/2023
Lincoln Day	Friday	02/17/2023
Washington Day	Monday	02/20/2023
Spring Recess/Good Friday	M-F	04/03-06/2023
Final Exam	Wednesday	05/17/2023