Computer Science I

Syllabus

Department of Computer Science & Engineering

University of Nebraska–Lincoln

CSCE 155H – Fall 2020

"If you really want to understand something, the best way is to try and explain it to someone else. That forces you to sort it out in your own mind... that's really the essence of programming. By the time you've sorted out a complicated idea into little steps that even a stupid machine can deal with, you've certainly learned something about it yourself."

—Douglas Adams, *Dirk Gently's Holistic Detective Agency*

In my experience, you assert control over a computer–show it who's the boss–by making it do something unique. That means programming it... If you devote a couple of hours to programming a new machine, you'll feel better about it ever afterwards"

—Michael Crichton, Electronic Life

The readings were the most underrated things ever (I've never actually read them but I wish I did) thanks for providing them and leaving the whole course available to us.

—Former student a year after taking this course

Enjoyed the videos. Did not really watch them videos until [later], realized that it was a mistake now.

—Former student a year after taking this course

"There are only two kinds of languages: the ones people complain about and the ones nobody uses."

—Bjarne Stroustrup (creator of C++)

"But be aware that you won't reach the skill level of a hacker or even merely a programmer if you only know one language–you need to learn how to think

about programming problems in a general way, independent of any one language. To be a real hacker, you need to have gotten to the point where you can learn a new language in days by relating what's in the manual to what you already know. This means you should learn several very different languages."

—Eric S. Raymond, How to Become a Hacker (The Cathedral and the Bazaar)

"I came into this class able to code by constantly using references and needing to double check my code. I left as a coding machine. The rate at which I did the last homework was like that of whole other person."

—Previous student via course evaluation

1 Course Info

Prerequisites: MATH 103 or equivalent.

Description: Introduction to problem solving with computers. Topics include problem solving methods, software development principles, computer programming, and computing in society.

Credit Hours: 3

Postrequisites: The course after this course, CSCE 156 – Computer Science II requires that you receive a grade of C or better in this course to move on. If you are a Computer Science or Computer Engineering major you will need to receive a C or better in this course to continue in the major.

For all other information, see the course website.

2 Skills Objectives

This course has several learning objectives and "skills objectives." These are the skills that, upon successful completion of this course, you should be able to exhibit.

- You should have a mastery of the fundamentals of programming in a high-level language, including data types and rudimentary data structures, control flow, repetition, selection, input/output, and procedures and functions.
- You should be able to approach a reasonably complex problem, design a top-down solution, and code a program in a high-level programming language that automates solutions.
- You should have a familiarity with problem solving methods, including problem analysis, requirements and specifications, design, decomposition and step-wise re-

finement, and algorithm development (including recursion).

- You should have a familiarity with software development principles and practices, including data and operation abstraction, encapsulation, modularity, code and artifact reuse, prototyping, iterative development, best practices in coding design, style, and documentation, a good understanding of proper testing and debugging techniques and a familiarity with development tools.
- You should have exposure to algorithms for searching, sorting and other problems, graphical user interfaces, event-driven programming, and database access.
- You should have a foundation for further software development and exploration. You should have a deep enough understanding of at least one high-level programming language that you should be able to learn another programming language with relative ease in a relatively short amount of time.

3 Honors Section

As an Honors course, topics are covered in a greater depth than the main section of this course. We cover the same topics as the main section, but we do so by covering two programming languages: C and Java. This gives us an opportunity to highlight the differences and idiosyncrasies of both languages. Assignments include exercises in both languages. Likewise, exams will also have questions that require knowledge of both languages. All students are responsible for material on both languages. Weekly lab assignments will also have two versions: one in C and one in Java. Both versions will cover the same concepts and have similar exercises. However, each student is required to complete only one version (the choice is left to the student). However, you are highly encouraged to complete both versions to gain a better knowledge of both languages.

4 Schedule

See the course website.

5 Accommodations for Students with Disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can discuss options privately. To establish reasonable accommodations, I may request that you register with Services for Students with Disabilities (SSD). If you are eligible for services and register with their office, make arrangements with me as soon as possible to discuss

your accommodations so they can be implemented in a timely manner. SSD contact information: 117 Louise Pound Hall.; 402-472-3787

6 Grading

Assessment (grading) will be based assignments, labs, and two exams with the following point distributions.

Category	Number	Points Each	Total
Starter Points			10
Attendance			0
Labs	14	10	140
Assignments	6	100	300
Midterm	1	100	100
Final	1	100	150
Total			1,000

6.1 Starter Points

It is important to start out positively. Put yourself in the mindset that you *will* succeed in this course and commit yourself to putting in a full effort in every aspect of it. To get you started, we're giving you 10 free points. You have a perfect score in this course already! Keep it up!

6.2 Attendance & COVID-19

6.2.1 Face Covering

Required Use of Face Coverings for On-Campus Shared Learning Environments

As of July 17, 2020 and until further notice, all University of Nebraska–Lincoln (UNL) faculty, staff, students, and visitors (including contractors, service providers, and others) are required to use a facial covering at all times when indoors except under specific conditions outlined in the COVID 19 face covering policy found at: https://covid19.unl.edu/face-covering-policy. This statement is meant to clarify classroom policies for face coverings:

To protect the health and well-being of the University and wider community, UNL has implemented a policy requiring all people, including students, faculty, and staff, to wear a face covering that covers the mouth and nose while on campus. The classroom is a

community, and as a community, we seek to maintain the health and safety of all members by wearing face coverings when in the classroom. Failure to comply with this policy is interpreted as a disruption of the classroom and may be a violation of UNL's Student Code of Conduct.

Individuals who have health or medical reasons for not wearing face coverings should work with the Office of Services for Students with Disabilities (for students) or the Office of Faculty/Staff Disability Services (for faculty and staff) to establish accommodations to address the health concern. Students who prefer not to wear a face covering should work with their advisor to arrange a fully online course schedule that does not require their presence on campus.

Students in the classroom:

1. If a student is not properly wearing a face covering, the instructor will remind the student of the policy and ask them to comply with it.
2. If the student will not comply with the face covering policy, the instructor will ask the student to leave the classroom, and the student may only return when they are properly wearing a face covering.
3. If the student refuses to properly wear a face covering or leave the classroom, the instructor will dismiss the class and will report the student to Student Conduct & Community Standards for misconduct, where the student will be subject to disciplinary action.

Instructors in the classroom:

1. If an instructor is not properly wearing a face covering, students will remind the instructor of the policy and ask them to comply with it.
2. If an instructor will not properly wear a face covering, students may leave the classroom and should report the misconduct to the department chair or via the TIPS system for disciplinary action through faculty governance processes.

6.2.2 Social Distancing & Attendance

Due to the continuing **COVID-19 pandemic**, the following policies and accommodations will be made for this course.

- No assessment will be made based on any synchronous attendance for instructional sessions (which includes lecture, lab, and office hours). The choice to attend face-to-face instructional sessions is left entirely to your own judgment. If you have a medical condition or other consideration or simply do not wish to unnecessarily expose yourself, you are *encouraged* to refrain from face-to-face sessions. You will not be judged nor will you be required to provide any documentation.
- If you feel sick, have a fever or other related symptoms, you *may not* attend face-to-face sessions. Please attend remotely.

- **Lecture**: we are fortunate enough that our lecture room will accommodate all students enrolled and so you *may* attend lecture face-to-face for every lecture session
- **Lab**: Our normal lab meeting room has had its capacity reduced to half (Avery 20, capacity 15). However, the department has secured a secondary *overflow* room on the same day/time. This overflow rooms are posted in Canvas but will *not* have lab computers. You may attend on a BYOD (Bring Your Own Device) basis. If you plan on using your own laptop and attending face-to-face, please make this overflow room your first choice. Once either room is filled to capacity, please go to the other room or consider attending remotely via zoom.

These are difficult conditions. Under normal conditions attendance would generally be required and assessed as there is a *strong correlation* with students who regularly attend lecture and labs and those who succeed academically in this course.

This course will be ever more challenging by having fewer of these face-to-face opportunities. However, we hope to make up for it using virtual sessions (via zoom) and have eliminated some assessments for this course offering.

6.3 Labs

There will be weekly labs that give you hands-on exercises for topics recently covered in lecture. The purpose of lab is not only to give you further working experience with lecture topics, but also to provide you with additional information and details not necessarily covered in lecture. Each lab will have some programming requirements and a supplemental worksheet.

Depending on logistics, those in the on-campus section may be randomly paired with a partner. One of you will be the *driver* and the other will be the *navigator*. The navigator will be responsible for reading the instructions and guiding the driver. The driver will be in charge of the keyboard and will type the code. Both driver and navigator are responsible for developing and working through solutions together. Neither the navigator nor the driver is "in charge," it is an equal partnership. Beyond your immediate pairing, you are encouraged to help and interact and with other pairs in the lab.

For those in the online section or those attending remotely, you may work alone or we may partner you with someone in a zoom breakout room.

Each lab is assessed based on completion. In general you will need to submit code and an electronic writeup of your worksheet (plain text or markdown is preferred) through webhandin which can also be verified using the webgrader. You will have until midnight on the day of the lab (Tuesdays) to submit your solutions. Points will be awarded based on the results of the webgrader.

6.4 Assignments

There are 6 assignments each constituting of several programming exercises. Code and other relevant files must be submitted using CSE?s webhandin. Many assignments will have requirements (file names, package requirements, command line input requirements, etc.) that will facilitate grading through an automated script. This script has been made available to you through the webgrader interface. You are expected to utilize this webgrader interface to ensure that your program is running as required and to fix any issues prior to the final due date (you may handin and run the script as many times as you like up to the due date). If your program fails to compile or run through the webgrader interface, you may receive a zero.

Understand that the webgrader interface is a black box tester. It is not a substitute for developing your own test cases and should not be used as the primary resource to debug your program; instead it is intended as a last-check mechanism.

The final homework may be due as late as Friday of Dead Week. As per the 15th week policy, this serves as written notice.

6.5 Exams

There will be one midterm exam and a comprehensive final exam. These will be open-book, open-note, *required computer* exams. The exams consist of live coding exercises for which you will need your own machine as you will be coding and submitting programs online for grading. More details will be announced closer to the exam dates. Due to attendance limitations, these will likely be "take home" exams. You will be on your own honor to complete these exams alone and without collaboration.

6.6 15th Week Policy Notification

A per UNL's 15th Week Policy (also known as "dead week") available here:

https://registrar.unl.edu/academic-standards/policies/fifteenth-week-policy/

we are required to serve written notice that the final assignment as well as the final lab, hack, and assignment will be due during the 15th week.

6.7 Scale

Final letter grades will be awarded based on the following standard scale. This scale may be adjusted upwards if the instructor deems it necessary based on the final grades only. No scale will be made for individual assignments or exams.

Letter Grade	Percent
A+	≥ 97
A	≥ 93
A-	≥ 90
B+	≥ 87
B	≥ 83
B-	≥ 80
C+	≥ 77
C	≥ 73
C-	≥ 70
D+	≥ 67
D	≥ 63
D-	≥ 60
F	< 60

6.8 Grading Policy

If you have questions about grading or believe that points were deducted unfairly, you must first address the issue with the individual who graded it to see if it can be resolved. Such questions should be made within a reasonable amount of time after the graded assignment has been returned. No further consideration will be given to any assignment a week after it grades have been posted. It is important to emphasize that the goal of grading is consistency. A grade on any given assignment, even if it is low for the entire class, should not matter that much. Rather, students who do comparable work should receive comparable grades (see the subsection on the scale used for this course).

6.9 Late Work Policy

In general, there will be no make-up exams or late work accepted. Exceptions may be made in certain circumstances such as health or emergency, but you must make every effort to get prior permission. Documentation may also be required.

Homework assignments have a strict due date/time as defined by the CSE server's system clock. All program files must be handed in using CSE's webhandin as specified in individual assignment handouts. Programs that are even a few seconds past the due date/time will be considered late and you will be locked out of handing anything in after that time.

6.10 Webgrader Policy

Failure to adhere to the requirements of an assignment in such a manner that makes it impossible to grade your program via the webgrader means that a disproportionate

amount of time would be spent evaluating your assignment. For this reason, we will not grade any assignment that does not compile and run through the webgrader.

6.11 Academic Integrity

All homework assignments, programs, and exams must represent your own work unless otherwise stated. No collaboration with fellow students, past or current, is allowed unless otherwise permitted on specific assignments or problems. The Department of Computer Science & Engineering has an Academic Integrity Policy. All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow this policy. Violations will be dealt with on a case by case basis and may result in a failing assignment or a failing grade for the course itself. The most recent version of the Academic Integrity Policy can be found at http://cse.unl.edu/academic-integrity

7 Communication & Getting Help

The primary means of communication for this course is Piazza, an online forum system designed for college courses. We have established a Piazza group for this course and you should have received an invitation to join. If you have not, contact the instructor immediately. With Piazza you can ask questions anonymously, remain anonymous to your classmates, or choose to be identified. Using this open forum system the entire class benefits from the instructor and TA responses. In addition, you and other students can also answer each other's questions (again you may choose to remain anonymous or identify yourself to the instructors or everyone). You may still email the instructor or TAs, but more than likely you will be redirected to Piazza for help.

In addition, there are two anonymous suggestion boxes that you may use to voice your concerns about any problems in the course if you do not wish to be identified. My personal box is available on the course webpage. The department also maintains an anonymous suggestion box available at https://cse.unl.edu/contact-form.

7.1 Getting Help

Your success in this course is ultimately your responsibility. Your success in this course depends on how well you utilize the opportunities and resources that we provide. There are numerous outlets for learning the material and getting help in this course:

- Lectures: attend lectures regularly and when you do use the time appropriately. Do not distract yourself with social media or other time wasters. Actively take notes (electronic or hand written). It is well-documented that good note taking directly leads to understanding and retention of concepts.

- Lecture Videos: Lecture videos are intended as a supplement that mirrors lecture material but that may not cover everything. Watch them at your own pace on a regular basis for reiteration or in case you missed something in lecture.
- Required Reading: do the required reading on a regular basis. The readings provide additional details and depth that you may not necessarily get directly in lecture.
- Labs & Hack Sessions: use your time during lab and hack sessions wisely. Engage with your lab instructors, teaching assistants, your partner(s) and other students. Be sure to adequately prepare for labs by reading the handouts before coming to lab. Get started and don't get distracted.
- Piazza: if you have questions ask them on Piazza. It is the best and likely fastest way to get help with your questions. Also, be sure to read other student's posts and questions and feel free to answer yourself!
- Office Hours & Student Resource Center: the instructor and teaching assistants hold regular office hours throughout the week as posted on the course website. Attend office hours if you have questions or want to review material. The Student Resource Center (SRC, `http://cse.unl.edu/src`) Monday through Friday. Even if your TAs are not scheduled during that time, there are plenty of other TAs and students present that may be able to help. And, you may be able to help others!
- Don't procrastinate. The biggest reason students fail this course is because they do not give themselves enough opportunities to learn the material. Don't wait to the last minute to start your assignments. Many people wait to the last minute and flood the TAs and SRC, making it difficult to get help as the due date approaches. Don't underestimate how much time your assignment(s) will take and don't wait to the week before hand to get started. Ideally, you should be working on the problems as we are covering them.
- Get help in the *right way*: when you go to the instructor or TA for help, you must demonstrate that you have put forth a good faith effort toward understanding the material. Asking questions that clearly indicate you have failed to read the required material, have not been attending lecture, etc. is *not acceptable*. Don't ask generic questions like "I'm lost, I don't know what I'm doing". Instead, explain what you have tried so far. Explain why you think what you have tried doesn't seem to be working. Then the TA will have an easier time to help you identify misconceptions or problems. This is known as "Rubber Duck Debugging" where in if you try to explain a problem to someone (or, lacking a live person, a rubber duck), then you can usually identify the problem yourself. Or, at the very least, get some insight as to what might be wrong.