COMSC 100: Introduction to Computer Science

Syllabus Fall 2019

Overview

This course is a broad high-level introduction to the field of computer science. We will learn about how hardware, software, and systems operate. Additional topics will include discussion of current events and concerns such as artificial intelligence, robots, and ethics.

The intended audience of this course are non-CS majors or undeclared majors who are interested in learning how computers work and what the field of computer science encompasses. No prior experience with computers is assumed, and there are no prerequisites.

This course is not an introduction to programming, though two of the labs are a gentle introduction to programming in Javascript. Gaining a high-level introduction to computer hardware, software, systems, and applications will benefit you should you learn to program in the future.

Learning Outcomes

Upon completion of this course, you should be able to:

- Explain the organization of the classical von Neumann machine and its major functional units.
- Explain why everything is data, including instructions, in computers.
- Trace the execution of a short code segment and summarize its computations.
- Create algorithms for solving simple problems.
- Gain experience debugging while writing code.
- Understand the organization of computer systems and the Internet.
- Describe positive and negative ways in which computer technology alters modes of social interaction at the personal level.

Course Meetings

Course meetings are Monday/Wednesday 9:30-10:45 AM in Kendade 307. Attendance is required. The class will be a mixture of lecture and hands-on activities.

Instructor

Prof. Heather Pon-Barry
Email: ponbarry@mtholyoke.edu
Website: www.ponbarry.com
Office: Clapp 226
Office hours: see moodle

Textbook

We will be using this textbook:

- *Understanding the Digital World: What You Need to Know about Computers, the Internet, Privacy, and Security.* Brian W. Kernighan. Princeton University Press, 2017. ISBN: 9781400884803.

You may purchase a hard copy or access the ebook for free through the library. You will be expected to complete assigned readings before class, approximately one chapter each week.

Course Topics

- Hardware
    - What's in a computer?
    - Bits, bytes, and binary
    - How computers work/inside the CPU
- Software
    - Algorithms
    - Programming languages
    - Concepts of programming
    - Operating systems, file systems, databases
- Communications
    - Networks
    - The Internet
- Applications (to be drawn from set below)
    - Natural Language Processing
    - Artificial Intelligence (AI) and Robotics
    - Ethics of AI

Course Requirements

- Weekly problem sets
    - There will be about eight problem sets. Problems are intended to be straightforward, reinforcing material covered in class and providing practice in quantitative reasoning, and should take 2-3 hours to complete. Problem sets will generally be due on Fridays at 5pm.
- Weekly labs
    - There will be seven or eight labs. Labs are intended to be straightforward and to give hands-on practice in aspects of computing related to the course. The labs are designed to be completed within 3 hours, if you have read through the instructions beforehand. Most labs will be introduced or started during class and will need to be completed independently outside of class.
- Midterm exam
    - There will be a take-home midterm exam the week of Oct 21.
- Exploratory report
    - You will have the chance to explore a topic of interest to you and connect it to topics in the course or in the discipline of computer science. A written report will be due in the week after Thanksgiving break.
- Final exam
    - There will be a self-scheduled exam in the final exam period. It will cover material from throughout the semester.

Grading

- Problem sets: 20%
- Labs: 15%
- Exploratory report: 7.5%
- Midterm exam: 20%
- Final exam: 30%
- Class participation: 7.5%

Late Policy

Problem sets and labs must be handed in on-time to recieve full credit, unless there are truly extraordinary circumstances (interviews, conference attendance, other coursework are not extraordinary circumstances). If you do submit your work late, credit for it will be on this scale:

- 90% for work submitted up to 12 hours late
- 75% for work submitted up to 24 hours late
- 50% for work submitted up to 48 hours late
- 0% for work submitted more than 48 hours late

Regardless, you must turn in all problem sets and labs to pass the course.

Access to CS Lab and Network

- You will be given:
  - An account on the Computer Science network, with the same username and password as you MHC account
  - Access to the Kendade 307 lab, which are equipped with Macs on the Computer Science network
- See the CS help site for more information about using the computers in the labs.

Attendance

Class attendance is extremely important and counts towards the participation component of the course grade. If you know that you will miss a class, let me know in advance. If an emergency arises and you miss more than one class, you should let me know as soon as possible. Ultimately, you are responsible for material presented in class and you should talk with a classmate about anything you missed. More than 3 absences will result in a lower participation grade.

Classroom Expectations

Cell phones should not be out during class. During lectures, laptop computers and tablets are allowed only for taking notes and you must sit in the front row(s) of the classroom. Violations of these policies will affect the participation component of your final grade.

Accommodations

AccessAbility Services is the office on campus that determines academic accommodations for students with disabilities. If you need official accommodations through AccessAbility Services, you have a right to have these met and kept confidential. Please contact AccessAbility Services, located in Mary Lyon Hall 3rd Floor, at 413-538-2634 or accessability-services@mtholyoke.edu. If you are eligible for academic accommodations, you will be provided with an accommodation letter. Once you receive your accommodation letter, arrange to meet with me to make a plan for our class. For more information on who might be eligible for accommodations and the application process please see the AccessAbility Services website (www.mtholyoke.edu/accessability).

Honor Code

Mount Holyoke College is a community of students, faculty, staff, and administrators committed to free inquiry and the pursuit of knowledge in the tradition of the liberal arts. The decision to join this academic community requires acceptance of special rights and responsibilities that are essential for its effective functioning and

the realization of its mission. All members of the community share the responsibility to uphold the highest standards of academic integrity.

I expect all your work to abide by the MHC Honor Code: "I will honor myself, my fellow students, and Mount Holyoke College by acting responsibly, honestly, and respectfully in both my words and deeds." Any work that does not will be reported to the Academic Honor Board. For more detail on what constitutes an academic violation of the Honor Code, please see the College Academic Rights and Responsibilities webpage.

Mount Holyoke College Computer Science Department Honor Code Statement
The Computer Science Department follows the Mount Holyoke College Honor Code. Work submitted for grading must be entirely your own, unless you were instructed to work in groups. The purpose of course assignments is to practice skills, gain a deeper understanding of the course material, and apply that knowledge to new situations. Assignments are designed to challenge you, stimulate critical thinking, and help you understand the concepts related to the course. Your grade is a reflection of your understanding of the material. We recognize that collaboration can help you master course material. In fact, there are certain ways in which we will encourage you to collaborate. These include: discussing course content at a high level, getting hints or debugging help, talking about problem-solving strategies, and discussing ideas together. However, you must do **all coding and write-ups on your own**. Writing code and solutions on your own will test and demonstrate your mastery of course material. **Looking at solutions from other students or any other source (including the web), or collaborating to write solutions to individual work, is considered a violation of the honor code**. All suspected violations will be referred to the academic honor board. If you are uncertain whether something is allowed, it is your responsibility to ask.

If you have engaged in any of the above acceptable collaboration activities for an assignment, you MUST acknowledge the classmates or TAs with whom you spoke – this should be done in a comment at the top of your main submission file.

Note that the Association for Computing Machinery has a strong Code of Ethics and Professional Conduct. At this site you can read the new 2018 version.

Internet sources:
The internet is a useful resource when learning to solve computer science problems, and in some cases you will be expected to use reference material found online (e.g., documentation for a programming language or library). In general, it's OK to look at resources for a broad topic such as a programming language, but it is not OK to look at solutions for specific programming or written problems. If you are unsure whether something is allowed, ask. **You must cite all online sources used while working on an assignment**. Instructors will clarify more specific expectations or deviations from this policy, but it is always the student's responsibility to ask if they are unsure.

Dos and Don'ts:
These lists are intended to clarify what types of behaviors are and are not generally permissible. Follow these guidelines unless specifically directed otherwise. (clarify if uncertain)

Do:

- Organize study groups.
- Clarify ambiguities or vague points in class handouts, textbooks, assignments, and labs.
- Discuss assignments at a high level to understand what is being asked for, and to discuss related concepts and the high-level approach.
- Refine high-level ideas/concepts for projects (i.e., brainstorming).
- Outline solutions to assignments with others using diagrams or pseudocode, but not actual code.
- Walk away from the computer or write-up to discuss conceptual issues if you get stuck.
- Get or give help on how to operate the computer, terminal, or course software.
- Get or give limited debugging help. Debugging includes identifying a syntax or logical error but not helping to write or rewrite code.
- Submit the result of collaborative coding work if and only if group work is explicitly permitted (or required).

Don't:

- Look at another student's solutions.
- Use solutions to same or similar problems found online or elsewhere.
- Search for homework solutions online.
- Turn in any part of someone else's work as your own (with or without their knowledge).
- Share your code or written solutions with another student.
- Share your code or snippets of your own code online.
- Allow someone else to turn in your work as their own. (Be sure to disconnect your network drive when you logout and remove any printouts promptly from printers.)
- Collaborate while writing programs or solutions to written problems. (But see above about specific ways to give or get debugging help.) Write homework assignments together unless it is specified as a group assignment.
- Collaborate with anyone outside your group for a group assignment.
- Use resources during a quiz or exam beyond those explicitly allowed in the quiz/exam instructions. (If it is not listed, don't use it. Ask if you are unsure.)
- Submit the same or similar work in more than one course. (Always ask the instructor if it is OK to reuse any part of a different project in their course.)

Specific guidelines for CS100

- You MUST acknowledge classmates or TAs that you worked with for each problem set or lab – this should be done at the top of your file.
- All the work that you submit must be yours: **it is against the honor code to have somebody else do the work for you or to copy it from somewhere else.**

Title IX/Responsible Reporter

If you or someone you know has been a victim of discrimination, harassment or violence based on sex or gender and you would like to talk to someone about our resources, please contact the Title IX Coordinator, Shannon Da Silva at titleixofficer@mtholyoke.edu.

As a faculty member, I am a responsible reporter for any information I learn that may be a violation of our Gender-based and Sexual Misconduct Policy. This means that I will need to share this information with our Title IX Coordinator, Shannon Da Silva. This could be anything related to sexual assault, dating violence, stalking or sex or gender-based harassment. If you are experiencing any of these things and you want to talk with someone who is not a responsible reporter, I can help direct you to private and confidential resources on campus (Counseling Service, Health Services, and Alcohol and Drug Awareness Project. These offices have a legal mandate for confidentiality. These offices are not required to turn over identifying information to the Title IX coordinator but may provide anonymous data to the Title IX coordinator for reporting requirements of the Clery Act).