CSE 001
Breadth of Computing
Fall 2019

version of Oct 6, 2019

Instructor:

- Hank Korth, email: hfk2@lehigh.edu, PA 414
- Graders:
  - Greg Cheng, lead, gtc220
  - Cody Benkoski, cob322
  - Jack Byers, jwb421
  - Brian Zhao, bcz222
- For fastest response, use the Piazza site
- Office hours posted on Piazza: see resources/staff. These hours change at times due to meetings and other events. Any such changes will be announced as a note on Piazza and any permanent changes will be placed in resources/staff.

University-required syllabus statements:

- *If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, Williams Hall, Suite 301 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.*

- *Lehigh University endorses The Principles of Our Equitable Community [http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity_Sheet_v2_032212.pdf]. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.*

Text:

- **Primary required text**:

  Nell Dale and John Lewis, *Computer Science Illuminated, 7th edition*, 2019. Jones & Bartlett Learning, ISBN 978-1-284-15561-7 (paperback) or ISBN 978-1-284-15565-5 for publisher's online access.

  - The online version (branded "Navigate2") offered by the publisher is acceptable.
  - It is also fine if several students share a copy as long as all involved have timely access to the text for reading assignments and exam study.

- **Other recommended reference texts:**

  These texts are suggested references. The Kernighan text is a superb survey of computing for future policy makers and political leaders, but much of it is superficial technically. It is a better source for impact of computing than the randomly placed sidebars in the Dale/Lewis text. The Toal/Dionisio text is a reasonable Javascript reference, but there are many good sources on the web (especially w3schools) and our coverage of web development will be very brief and simple. The Snyder text is another intro text that has reasonable Javascript coverage, but is generally less technical than Dale/Lewis.

  - Brian W. Kernighan, *Understanding the Digital World,* 2017, Princeton University Press, ISBN 978-0-691-17654-3
  - Ray Toal and John David N. Dionisio, *Javascript Programming Language,* Jones and Bartlett Publishers, 2010, ISBN 978-0-7637-6658-0
  - Lawrence Snyder, *Fluency with Information Technology: skills, concepts & capabilities*, 6th edition, 2015. Pearson Education, Inc. ISBN 978-0-13-357739-6

Class Work:

We shall be using two online sites: Lehigh's CourseSite and the externally-supported Piazza. Piazza has a much more usable question/answer feature and great app support as compared to CourseSite. CourseSite will be used only for submitting work (because Piazza does not support that).

The University sets up your CourseSite access automatically. For Piazza, I must arrange for an invitation to be sent to you. Once you log into Piazza, you will find instructions on its use.

Assigned readings are listed in the day-by-day schedule below. Lectures will be related to the assigned readings, but in most cases, the lecture will not be a direct repetition of the readings. I shall assume that you have read the required readings ***before*** lecture (except for the first class of the semester). Any announcements will be posted on Piazza. Therefore, you are expected to check Piazza regularly (but there is no need to check CourseSite except when you have something to submit). There will be two in-class quizzes, and a final exam. Exams will be based on the material covered in lecture, lab, and the assigned readings.

Lab Work:

Labs will be held on Wednesdays. Lab will be held in the Sandbox Lab (PA 112). Students will work in pairs. You are free to choose your own partner and free to choose any open machine. You do not have

to keep the same lab partner each time except for projects spanning more than one lab. The graders will be available in lab for assistance..

There are 14 weeks in the semester, but only 11 graded labs.

Attendance at *lab* is mandatory. If you need to miss a lab due to a religious holiday, extracurricular commitment, or other planned event, you must contact the instructor at least one class meeting in advance. For unplanned events (e.g., illness) email the instructor as soon as practical. Although I do not include *lecture* attendance as a formal part of the grade, I expect everyone to be in class unless there is a good excuse. You are responsible for topics covered in class even if they do not appear in the text.

Grading:

Your grade will be computed as follows:

- Lab Assignments 20% (2 points for each of 11 graded labs)
- Homework Assignments (10) 20% (2 points each)
- JavaScript Programming Assignment 20%
- Quiz 15% (Wed Oct 2)
- Final Exam 25% (Date to be announced by registrar later)
    - TRAVEL: Please do not make winter-break travel reservations until the exam schedule is announced unless you will stay at Lehigh for the entire exam period. No makeup exams will be offered to allow early departure for breaks.

Assignments:

Homework assignments will be posted on Piazza and submitted on CourseSite. CourseSite will enforce deadlines and, thus, prevent late work from being submitted; thus, late work will not be accepted. *Please verify that your work has actually been uploaded. Failure to upload successfully is not a valid excuse for late work.*

Late Policy:

Students are expected to hand in all labs, programming assignments, and homework assignments on the day and time they are due. No credit will be given to late work unless an excuse is granted in advance. Students are advised to back up their files to the university-supported H drive, a USB drive, cloud service, and/or an external hard disk on a regular basis. Because the H drive is easily accessible as a backup, failure of one's personal machine is not an acceptable excuse for late work. There are numerous university and departmental labs available to you as an alternative if your personal machine should fail.

Computer and Cell Phone Policy:

Cell phones must be kept silent and should not be used except for emergencies. Although computers (including tablet computers) are useful note-taking tools, they often distract from the lecture. For this reason, we ask that computers not be used during lecture. Exceptions to the rule will be made to accommodate disabilities.

Collaboration Policy:

All homework and programming assignments, unless explicitly stated in the problem definition, are to be an individual effort. You are encouraged to discuss assignments with one another, your friends, and with the instructor and graders for the course. Indeed, this may be the most effective method of learning. You may share concepts, approaches and strategies for producing a solution. However all work submitted in your name must be your own. You may not copy code in whole or in part from another student or from a Web site. Violations will be considered as cases of academic dishonesty. Please refer to the "Collaboration Policy" (http://www.cse.lehigh.edu/~brian/course/2013/cunix/cheating.html) statement for more examples of what is and what is not unfair collaboration. If any aspect of this policy is not clear to you, don't make assumptions; consult with the instructor.

Labs, on the other hand, are collaborative in that help is encouraged, although you need to submit your own solution on CourseSite. Exceptions to this will be announced in lab.

Weather, Delayed Opening, and Illness:

- In the event of a late opening of the University due to weather, we shall start class at university opening time or normal class time, whichever comes later. Students driving to class should of course, make prudent choices about travel in adverse conditions. If my commute is affected by weather, I will do my best to email the class and/or post to Piazza.
- If you are ill, your classmates will appreciate you not sharing your flu or virus. You do not need an excuse for a missed lecture unless there is a scheduled quiz or exam on that date. You are responsible for getting notes from a classmate. If health issues cause you to miss a lab, please inform me by email as soon as possible and we shall make suitable arrangements for you to make up the missed lab.

Date	Topics	Readings	Assignments / Comments
Mon Aug 26	Course overview. Broad overview of topics in computer science	Dale/Lewis Ch 1	Book presents another approach to an overview of CS in contrast to lecture Homework 0
Wed Aug28	Lab 1 - using Linux and transferring files		Bring password emailed to you to login to the CSE Department's Sunlab computers. Instructor at database research conference. Lab run by graders
Fri Aug 31	no class, instructor at database research conference		We will make up this 50 minute class by running 75 minute class meetings on Monday Sep 2 and Friday Sep 6 Please review the Sep 2 reading before class
Mon Sep 2	Networking Structure of the Internet, and the TCP/IP and Ethernet protocols	Dale/Lewis Sec 15.1, 15.2, 15.3	Labor Day: classes held. only administrative offices are closed 75-min class (make up for half of Aug 31) Homework 1 (networking) H0 due
Wed Sep 4	Lab 2 - spreadsheets	Dale/Lewis Sec 12.1, 12.2	We shall be using LibreOffice in the Sunlab
Fri Sep 6	Using HTML to construct static web documents	Dale/Lewis Sec 16.1, 16.2	75-min class (make up for half of Aug 31) https://www.w3schools.com/html/html_basic.asp is a useful online source H1 due
Mon Sep 9	Data representation in a computer: ints, floats, chars, RGB	Dale/Lewis Ch 2, Ch 3, Sec 18.1	We won't cover text compression/encoding (just ASCII), audio and video data, but read those for general knowledge Homework 2 (data representation)
Wed Sep 11	Lab 3 - creating an HTML document		Lab involves a non-interactive web page.
Fri Sep 13	Javascript	No Dale/Lewis coverage see Toal text	A good online source is https://www.w3schools.com/js/default.asp BUT we'll be covering only a small subset of Javascript. Most web sites are designed for experts, not beginners H2 due
Mon Sep 16	Javascript		no specific homework, but practice Javascript on your own
Wed Sep 18	Lab 4 - Javascript calculator		Lab involves edit a somewhat broken Javascript calculator provided as a starting point
Fri Sep 20	more Javascript Introduce programming assignment		Programming Assignment (due Oct 7 but start early)
Mon Sep 23	Algorithms: searching and sorting recursion	Dale/Lewis Ch 7, Sec 18.3 up to page 612	Homework 3 (Algorithms)

Wed Sep 25	Lab 5 - coding a sort in Javascript		
Fri Sep 27	Programming language paradigms	Dale/Lewis Ch 9	H3 due
Mon Sep 30	Ethics and social issues	Dale/Lewis various pages	In Dale/Lewis see page XXX (yes, literally, in the front matter) for references
Wed Oct 2	Quiz during lab period in a room to be announced		
Fri Oct 4	Security and cryptography	Dale/Lewis Ch 17	Lecture will be largely on cryptography since there is little coverage in the text Homework 4 (cryptography)
Mon Oct 7	discussion of quiz		project distrubuted
Wed Oct 9	retry of Lab 5 after Firefox version compatibility issue		and project help session if you have lab 5 done. Attendance is required unless you have already **submitted** both lab 5 and the project. (*a draft is not enough to be excused from this lab*)
Fri Oct 11	Artificial intelligence and machine learning	Dale/Lewis Ch 13	Text focuses on classic artificial intelligence. Lecture will include a survey of machine learning H4 due
Mon Oct 14	no class - pacing break		
Wed Oct 16	project help session		We'll be in the lab to consult one-on-one on the project. Attendance at this lab is optional but a great chance to ask questions, try out the answer, and follow up immediately
Fri Oct 18	Compilers and computer architecture	Dale/Lewis Ch 4, Ch 5, Sec 9.2	classic architecture (mem/proc/bus/storage hierarchy), modern architecture (multicore, cache,, NVRAM, RDMA) Homework 5 (computer architecture)
Mon Oct 21	Machine-level coding	skim Dale/Lewis Ch 6	We shall be using a simpler machine than the Pep/9 cited in the text. See http://users.dickinson.edu/~braught/kands/kands.html and read materials there to prepare for lab project due
Wed Oct 23	Lab 7 - machine-code programming, part 1		
Fri Oct 25	Operating systems	Dale/Lewis Ch 10, 11	H5 due
Mon Oct 28	Operating systems	Da/e.Lewis Ch 10, 11	Homework 6 (operating systems)

Wed Oct 30	Lab 8 - machine code programming, part 2		
Fri Nov 1	Databases and SQL	Dale/Lewis 12.3	Lecture will provide much more detail than text H6 due
Mon Nov 4	Transactions and distributed systems	not covered in text	Homework 7 (databases)
Wed Nov 6	Lab 9 - Databases: SQL queries		
Fri Nov 8	Data analytics / cloud / mining	Dale/Lewis Sec 12.4. 12.5, 15.4	H7 due
Mon Nov 11	Blockchain	Dale/Lewis sec 15.5	Lecture will provide much more detail than text Homework 8 (blockchain)
Wed Nov 13	Lab 10 - Databases: create database		PLAN: each partner creates a table, partners then update the others table
Fri Nov 15	No class - presenting at FinTech conference		H8 due despite class cancellation
Mon Nov 18	Blockchain, FinTech, regulation and policy	not covered in text	75 min to make up for Friday Homework 9 (policy issues)
Wed Nov 20	Lab 11 - blockchain explorer lab		
Fri Nov 22	Intellectual property / patents	not covered in text	
Mon Nov 25	Graphics	Dale/Lewis Sec 3.5, 3.6, 14.3, 14.4	H9 due
Wed Nov 27 and Fri Nov 29	no class - Thanksgiving break		
Mon Dec 2	Computability	Dale/Lewis sec 18.3, page 612 to end	
Wed Dec 4	Final lab: HTML/Javascript review exercise		
Fri Dec 6	Final class: review		
Sat Aug 10	Final exam		no makeups for pre-purchased plane tickets; wait for RAS to post the schedue.