

CMPSCI 145
Spring 2017
Representing, Storing, and Retrieving Information
(Revised)

Professor William T. Verts

Class:

Lectures: Monday, Wednesday, Friday 11:15AM–12:05PM, ILC N101.

Office Hours and Email:

LGRC A357, Office hours to be arranged. Appointments at our mutual convenience. On several Mondays I must leave directly after class, as I will be attending noon-time CMPSCI faculty meetings.

verts@cs.umass.edu Personal, for asking questions. Put CMPSCI 145 in the subject line.

literacy@cs.umass.edu For submitting on-line materials. Put CMPSCI 145 in the subject line.

I read all email daily, but do not expect a speedy reply. I might not reply at all if the question is something I can address in class. Do NOT email attachments to me; they will be deleted. Do not call me at home.

TA: The TAs will hold office hours in LGRT 222, perform the grading, and be available to assist in all aspects of this course. Hours to be arranged. TA office is shared by all TAs and graders for all my courses.

Books: *Representing, Storing, and Retrieving Information*, 4TH Edition, ©2009, William T. Verts.
Computer Science Companion, 3RD Edition, 2016 Printing, ISBN 978-1-5249-0236-0, ~\$24, also by me.

Web: <http://www.cs.umass.edu/~verts> (then follow the link to the 145 page), or:
<http://www.cs.umass.edu/~verts/cmpsci145/cmpsci145.html>
<http://www.cs.umass.edu/~verts/cmpsci145/quizzes/quizzes.html>

Twitter and other Social Media:

Please do not “friend” me on Facebook, Linked-In, or other social networks. I reserve Facebook for relatives, hiking buddies, and friends from high-school. I do not often post messages on Twitter.

Course Scoring (percentages may change according to number and type of assignment):

Midterm 1	15% (open book, March 3, in-class)
Midterm 2	15% (open book, April 7, in-class)
Final Exam	25% (open book, Tuesday, May 9, 10:30am, in Goessmann 20, with a take-home portion)
Homework	15% (formally assigned homework, in-class exercises, in-class quizzes, etc.)
Projects:	30% (singly, but there may be small group projects)

Letter grades will be assigned according to final computed course score:

A ≥ 90%, A- ≥ 88%, B+ ≥ 86%, B ≥ 80%, B- ≥ 78%, C+ ≥ 76%, C ≥ 64%, C- ≥ 62%, D+ ≥ 60%, D ≥ 50%, F < 50%. Missing either of the midterms, or the final exam, incurs an automatic F for the course. Fractional final course scores are rounded to the nearest integer (87.49999 rounds down to 87 for a B+, while 87.50000 rounds up to 88 for an A-).

Computer: It is expected that you either have your own computer running a later version of Mac OS-X or Windows (typically Windows 7, 8, or 10). Assignments may be completed on OIT equipment in UMass campus labs, but you *might* have some difficulties in using class-provided software there. Home computers should have a recent version of Microsoft Word and Excel installed. You must also have a working Internet connection and Web browser (Mozilla Firefox or Google Chrome recommended). Ability to read .PDF files and to pack and unpack .ZIP files is required. Get a USB flash drive (SanDisk recommended) for archiving your data files, and for bringing work in to me or the TA to examine. I may provide free software for you to use.

Final Notes:

1. **DO YOUR OWN WORK, INCLUDING HOMEWORK AND LAB WORK.** You may discuss homework and lab assignments with other students, but you may not share files or disks. Any essays or term papers must be your own work as well. Upon discovery of duplication, I will contact you for a conference, as required in the guidelines set out by the University of Massachusetts Academic Honesty Policy, and we will resolve the issue according to those guidelines. See the document at:
http://www.umass.edu/dean_students/codeofconduct/acadhonesty/
2. **Do not** ask for extra work after the end of the semester to boost an undesirable grade. I never grant such requests.
3. Please contact me directly if you have any concerns about the running of the course, the TA, grading, etc.

		Monday	Wednesday	Friday
JANUARY	1	January 23 – First Day. What’s it all about? Why do we care?	January 25 – Analog Devices that are Mechanical. Antikythera Machine.	January 27 – More about Analog Mechanical Devices. Slide Rules.
	2	January 30 – Digital Devices that are Mechanical. Punched Cards.	February 1 – More about Digital Devices. Comptometer.	February 3 – Basic Electricity: Ohm’s Law and resistor networks.
FEBRUARY	3	February 6 – Analog Functional Elements.	February 8 – Digital Functional Elements (Gates).	February 10 – Digital Devices, introduction to unsigned binary integers.
	4	February 13 – Signed binary integers (Sign&Mag, 1’s Comp, 2’s Comp).	February 15 – Continuation of Signed Integer representations.	February 17 – Rational and Fixed-Point numbers. IEEE 754 Floating Point representations.
	5	February 20 – Presidents Day HOLIDAY	February 22 – Continuation of Floating Point representations.	February 24 – Round-Off Errors. Interval Arithmetic and UNUMs
	6	February 27 – Symbolic representations.	March 1 – Review for midterm.	March 3 – MIDTERM #1
MARCH	7	March 6 – Parametric Lines and Curves.	March 8 – Quadratic Splines, Bézier Curves, Lagrange Interpolation.	March 10 – Computational Geometry and Graphics Issues.
	8	March 13 – Spring Break	March 15 – Spring Break	March 17 – Spring Break
	9	March 20 – More on Graphics and Geometry. Ray-Tracing.	March 22 – Frequency Analysis, Audio representations.	March 24 – Representations of Video.
	10	March 27 – Basic Searching, Big-O Notation, Self-Organizing Lists, Trees	March 29 – Hashing, the Soundex algorithm.	March 31 – Sorting. Intro to simple Database Queries.
APRIL	11	April 3 – Queries (Linear, Random-Access, Hierarchical). Pyramids.	April 5 – Review for midterm.	April 7 – MIDTERM #2
	12	April 10 – Intro: Information Theory, Serial vs. Parallel, UARTs.	April 12 – Parity and Cyclic Redundancy Checks, Hamming distance.	April 14 – Error Detection and Correction.
	13	April 18 (TUESDAY) – Compression: Run-Length Encoding, Huffman Coding.	April 19 – Delta Modulation, LZW compression.	April 21 – Coding: Morse, Nerds in the Woods, QR, Data Matrix, etc.
	14	April 24 – More on Coding, what is encryption?	April 26 – Cryptography: single key vs. public key.	April 28 – More on public key encryption. Steganography.
MAY	15	May 1 – Last Day of Class. Review of Course.	FINAL’S WEEK	