Syllabus

EECE 7205 Fundamentals of Computer Engineering

Fall 2019

Class Information:
Time: 9:50am – 11:30am TF
Classroom: Snell Library 033 and Online

Instructor:
Xue (Shelley) Lin, Assistant Professor, Dept. of Electrical and Computer Engineering
Office Hour: 1pm – 3pm Tuesday
Office: DANA 320
Email: xue.lin@northeastern.edu Website: https://web.northeastern.edu/xuelin/

Teaching Assistant:
Mengshu Sun, PhD Student,
Dept. of Electrical and Computer Engineering
Office Hour: by appointment
Email: sun.meng@husky.neu.edu Cell Phone: (781) 827-9965
Office: 140 The Fenway (see "TA Office Location Instruction" on the last page)

Course Objectives

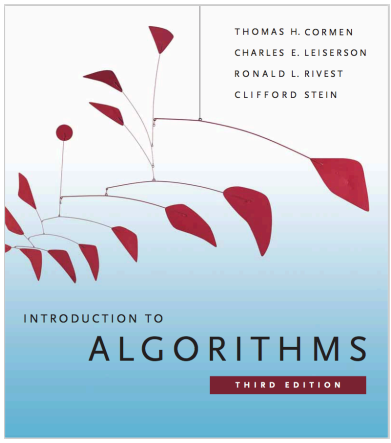
This course introduces students to the analysis and design of computer algorithms. Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Course Topics

- Analysis of Algorithms, Insertion Sort, Mergesort
- Asymptotic Notation, Recurrences, Substitution, Master Method
- Divide-and-Conquer: Strassen, Fibonacci, Polynomial Multiplication
- Quicksort, Randomized Algorithms
- Linear-time Sorting: Lower Bounds, Counting Sort, Radix Sort
- Order Statistics, Median
- Hashing, Hash Functions
- Universal Hashing, Perfect Hashing
- Relation of BSTs to Quicksort, Analysis of Random BST
- Red-black Trees, Rotations, Insertions, Deletions
- Augmenting Data Structures, Dynamic Order Statistics, Interval Trees
- Skip Lists
- Amortized Algorithms, Table Doubling, Potential Method

- Competitive Analysis: Self-organizing Lists
- Dynamic Programming, Longest Common Subsequence
- Greedy Algorithms, Minimum Spanning Trees
- Shortest Paths
- Advanced Topics



Textbook

Cormen, Thomas, Charles Leiserson, Ronald Rivest, and Clifford Stein.
Introduction to Algorithms.
3rd ed. MIT Press, 2009. ISBN: 9780262033848.

Grading Policy

- Homework 25%
- Quiz 25%
- Project I 20%
- Project II 30%

Homework

5 homework assignments posted/submitted on Blackboard and due in one week.
Strict deadlines, no extensions.

Quiz

5 in-class close-book quizzes, 30min each.
For the online session students only, I will send the quiz through email when the in-class quiz begins (usually the last half hour of a lecture). The online session students should return the answer by email within one hour.

Project I

Program to solve practical problems.
Individual effort.
Report required.

Project II

Program to solve practical problems.
Team of no more than 2 students.
Report and demonstration required.

Grade Conversion

Your total grade is calculated as a numeric grade between 0 and 100, and converted into a letter grade using the following scale:

A	:	100~95	C	:	76.65~73.33
A-	:	94.99~90	C-	:	73.32~70
B+	:	89.99~86.66	D+	:	69.99~66.66
B	:	86.65~83.33	D	:	66.65~63.33
B-	:	83.32~80	D-	:	63.32~60
C+	:	79.99~76.66	F	:	59.99~0

Course Policy

Attendance

Attendance to lecture sessions is highly recommended. If you need to miss a lecture, you can use the online video recorded of the lecture or make appointment with me for catching up.

Discussion Board on Blackboard

Please post course-related questions on the Discussion Board on Blackboard. If you send the instructor an email with questions that may benefit others in the class, the instructor will ask you to post your questions on Blackboard. For questions pertaining your personal situation, send an email to the instructor instead.

Make-up Exams

Make-up exams will be scheduled individually only under these circumstances:

- Sickness justified by a doctor's note prior to scheduling a make-up exam.
- Academic or athletic activity organized by the University and strictly requiring the student's presence, such as a conference or sports competition. In this case, the student's absence must be confirmed by the University staff member coordinating the event prior to scheduling the make-up exam.

Make-up exams will not be scheduled for any reason other than those cited above. Here are some tips to avoid missing important events that may impact your final grade.

- Please schedule all your job or co-op interviews outside of lecture times, even those in which there is no exam. An exam will not be rescheduled to accommodate this type of events.
- Please plan all your trips according to our class and exam schedule. In the winter, monitor the weather and make sure you make it back on campus safely and on time for the next important event.
- Exams may have to be rescheduled due to winter snowstorms, changes in the course topics, or other unpredictable events. In those cases, they will be typically held on the next lecture time slot. All students are responsible for making themselves available at the class meeting times when an exam is rescheduled, even if they do not match the dates originally planned for them.

TA Office Location Instruction

Follow the instruction below to TA's Office: Office R306 of TF building

1. Go to the building "140 The Fenway (TF)" (#80 on the map), address: 140 Fenway, Boston, MA 02115.

2. Use the entrance from the parking lot, take the elevator to the 3rd floor.
4. Call TA Mengshu Sun at (781) 827-9965 and she will pick you up in front of the elevator on the 3rd floor.

You are welcome to send an email to TA (sun.meng@husky.neu.edu) for an appointment, so that she can be aware of your phone call to pick you up.