

# EE 5453 --- Advanced Data Structures and Algorithms (Fall 2017)

## Course Syllabus

**Instructor:**

Lide Duan  
Assistant Professor  
Department of Electrical and Computer Engineering  
University of Texas at San Antonio

**Office:** AET 2.376

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**Class Meeting Times:** 1:00-2:15PM (Tuesdays and Thursdays)

**Class Location:** AET 0.102

**Office Hours:** 3-5PM (Tuesdays and Thursdays) or by appointment.

**Website:**

All course materials will be handled electronically through the UTSA Blackboard Learn system. These include:

- Slides, HW, solutions, and other course materials distributed by the instructor.
- Notifications sent out by the instructor to all student emails.
- HW submissions by students.

**Course Description:**

Algorithm design and analyses; real-world problem solving using programming.

**Prerequisite:**

Graduate standing. Non-experience in algorithms is assumed. However, some programming experience in high-level programming languages would be helpful in understanding pseudo-code and completing the course project.

**Textbook (required):**

Introduction to Algorithms, 3rd Edition. (By Thomas H. Cormen , Charles E. Leiserson, Ronald Rivest, and Clifford Stein).

<https://mitpress.mit.edu/books/introduction-algorithms>

**Course Topics (tentative):**

- Sorting
- Divide-and-conquer
- Algorithm complexity analyses
- Amortization
- Elementary data structures
- Trees
- Heaps
- Hashing
- Graphs
- Greedy algorithms

- Dynamic programming
- NP-completeness

#### Grading Policy:

- Homework assignments: **30%**
  - Three assignments at 10% each.
- Exams: **40%**
  - Exam 1 (12.5%) + Exam 2 (12.5%) + Final (15%)
- Project: **25%**
- Quizzes: **5%**
  - The instructor will randomly choose a few classes to ask the students to turn in an answer to a very simple question. These are mainly for checking attendance.
- Total: **100%**

#### About the Grading

- The final letter grades will be curved based on student ranks and score gaps.
- After a grade (of an assignment/exam/quiz) is posted, you have up to a week to see me for any errors. After that, the grade is finalized.

#### About the HW Assignments

- There will be three HW assignments; each is assigned and due before an exam.
- HW questions are good examples of exam questions.
- All assignments must be submitted in pdf through Blackboard Learn before the specified deadlines. There will be no delay policy, and submissions missing the deadline will NOT be graded.
- No copying is allowed on any assignment. All parties involved (either copying or being copied) will lose all the points for the assignment.

#### About the Exams

- Tentatively, Exam 1 will be on Thursday 9/14 (class time); Exam 2 will be on Thursday 10/19 (class time); and the Final Exam will be on Wednesday 12/13 (9:45AM).
- All exams are open-books and open-notes. You can bring your laptop for accessing course materials, but Internet access and communication with others are not allowed.
- No make-up exams (except for extremely special situations with legitimate proof and under discretion of the instructor).

#### About the Project:

- The project will be assigned after Exam 1 is completed, and due in the last week of the semester.
- A real-world problem will be assigned. The student needs to propose a solution (i.e., designing an algorithm), implement it, and report the whole process.
- The project can be implemented in any high-level language (e.g., C, C++, Java, Python, etc.) under any operating system (e.g., Linux, Mac OS, Windows, etc.). However, it is your responsibility to make sure that your submitted program can be compiled and run on the instructor's machine with reasonable effort.
- **The project must be completed individually.** Discussions with others are allowed, but copying source code is NOT! Automatic source code checking tools, in addition to manual effort, will be applied to check for coding plagiarism. All parties involved (either copying or being copied) will lose all the points for the project.