CSC 349: Design and Analysis of Algorithms
Fall 2017
Course Syllabus

September 15, 2017

Instructor: Alexander Dekhtyar
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office: 14-210

What	When		Where
Lecture	MWF	2:10 – 3:00pm	14-246
Lab	TR	3:10 – 4:00pm	14-301

Office Hours

	When	Where
Monday	11:00am - 12:00pm	14-210
Wednsday	9:00am - 12:00pm	14-215

Additional appointments can be scheduled by emailing the instructor at *dekhtyar@calpoly.edu*.

Overview

This courses introduces you to the concepts and techniques of algorithm design and analysis. Students who complete the course will understand the role of algorithms in computer science; will become familiar with a number of classical computer science algorithms and will understand the meaning and the significance of complexity classes P, NP, NP-complete and NP-hard and will know examples of problems from these classes.

Textbook

Required: *Algorithms*, S. Dasgupta, C.H. Papadimitriou, U.V. Vazriani, McGraw-Hill, 1st Edition, September 2006, ISBN-10: 0073523402

Supplemental: *Introduction to Algorithms*, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, MIT Press. (*any edition*).

Topics

The following will be covered in the course.

No.	Topic	Duration (weeks)
1.	Introduction: algorithms and algorithm analysis	1
2.	Divide and conquer algorithms	1
3.	Graph Algorithms	2
4.	Greedy Algorithms	1
5.	Dynamic Programming	2
6.	Complexity and NP-Completeness	2
7.	Approximation Algorithms	1

Most of the topics will be covered in the order specified above, but some divergence is possible.

Note I will be away for a number of days around *October 30*. I will not be in class for *October 30* and, possibly *November 1* or *October 27* classes. We will figure out what exactly happens to these classes some time in October.

CSC 349 in Fall 2017 There are four sections of CSC 349 taught in Fall 2017. The other three sections are taught by Dr. Theresa Migler-VonDollen. This section will follow roughly the same schedule and order of topics as Dr. Migler-VonDollen's sections, and will have similar deliverables, although specific assignments, handouts, quiz and exam questions (except for the common final) will be unique to our section.

Grading

Homeworks and Labs	25%
Quizzes	45%
Final Exam	30%

I give relatively hard problems and take points off on exams. Because of this, the traditional 90-A, 80-B, 70-C grading schema does not work in my classes. Historically, the A/B cutoff has been around 80-85%, while the B/C cutoff has been around 70%.

Course Policies

Exams and quizzes

Dr. Migler-VonDollen and I will have a joint **common final exam** for this course. The exam will take place during one of the time alotted by the University for common finals. Once the date is determined, we will convey it to each section.

There is no midterm exam.

There will be five paper-and-pencil quizzes tentatively scheduled for the following dates:

Date	Topic
September 29 (Friday)	Divide-and-conquer algorithms
October 13 (Friday)	Graph Algorithms
October 23 (Monday)	Greedy Algorithms
November 6 (Monday)	Dynamic Programming
November 29 (Wednesday)	Complexity and Approximation

The quizzes will be announced/confirmed at least one class ahead of time. The quizzes will be administered during lab periods, therefore on the days of the quizzes, lab period attendance is mandatory. The quizzes will take the entire lab period. **There will be no makeup quizzes**. The lowest quiz score will be dropped.

Homeworks, Labs

There will be 6-8 lab assignments and, possibly, a number of homework assignments.

Lab assignments are intended to give you hands-on experience with designing and implementing well-known algortihms and applying classical problem-solving techniques. Most of the lab assignments will be done in pairs or small groups, although individual assignments are possible as well.

Paper-and-pencil homework assignments will test your problem-solving skills related to algorithm design and analysis. They will also prepare you for the quizzws and the final exam. These assignments will typically not be graded, but they may be collected for "show your work" credit.

Programming Languages

We will use Python and Java as our programming languages for lab assignments.

Most of my examples in class will be in Python (beacuse they are easier to demo). I reserve the right to make certain labs language-specific.

Late Submissions

All assignments are due at classtime on the due date: homeworks - at the beginning of the class (with grace period extending to the beginning of the lab period); lab assignments - as directed in each assignment.

Homework/lab assignments submitted later than indicated above will be considered *late submissions*.

If paper-and-pencil homework solutions are distributed on the due date of the homework, ***late homework submissions will not be accepted***. Otherwise, late homeworks can be submitted during next 24 hours for a 10-30% penalty (the exact amount will depend on the submission time and the specific circumstances). No homework submissions will be accepted afterwards.

Late lab assignment submissions can be turned in before or at the beginning of the next lab period for a 10-30% penalty (the exact amount will depend on the submission time and the specific circumstances[1]). No lab assignment submissions will be accepted after that.

Communication

The class will have an official mailing list. The email address for the mailing list is *csc-349-06-2178@calpoly.edu*. All students enrolled in the class are automatically subscribed to the mailing list.

I encourage questions during classtime and questions via email. My answers to email questions may be broadcast to the entire class via the mailing list, if the answer may be relevant to everyone (e.g. a correction in a text of a handout, or a clarification of a homework problem), and may also appear on the web page. The questions can also be posted to the mailing list directly. The mailing list will also be used for all annoucements related to the course. It is your responsibility to read your class-related email. Failure to read email posted to cs405001 mailing list cannot be used as an excuse in the class.

Web Page

Class web page can be found at

http://www.csc.calpoly.edu/∼dekhtyar/349-Fall2017

Through this page you will be able to access all class handouts including homeworks, project information and lecture notes (should the latter be written).

Links to web pages with additional information (such as CSLAB database support page) and important notes and announcements will also be posted.

0.1 Students with Disabilities

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Disability Resource Center, Building 124, Room 119, at (805) 756-1395, as early as possible in the term.

[1] The penalty will be larger if the gap between the two lab periods includes a weekend and smaller otherwise

Academic Integrity

University Policies

Cal Poly's Academic Integrity policies are found at

http://www.academicprograms.calpoly.edu/academicpolicies/Cheating.htm

In particular, these policies define *cheating* as (684.1)

> "... *obtaining or attempting to obtain, or aiding another to obtain credit for work, or any improvement in evaluation of performance, by any dishonest or deceptive means. Cheating includes, but is not limited to: lying; copying from another's test or examination; discussion of answers or questions on an examination or test, unless such discussion is specifically authorized by the instructor; taking or receiving copies of an exam without the permission of the instructor; using or displaying notes, "cheat sheets," or other information devices inappropriate to the prescribed test conditions; allowing someone other than the officially enrolled student to represent same.*"

Plagiarism, per University policies is defined as (684.3)

> "... the act of using the ideas or work of another person or persons as if they were one's own without giving proper credit to the source. Such an act is not plagiarism if it is ascertained that the ideas were arrived through independent reasoning or logic or where the thought or idea is common knowledge. Acknowledgement of an original author or source must be made through appropriate references; i.e., quotation marks, footnotes, or commentary."

University policies state (684.2): "Cheating requires an "F" course grade and further attendance in the course is prohibited." (appeal process is also outlined, see the web site above for details.). Plagiarism, per university policies (684.4) can be treated as a form of cheating, although a level of discretion is given to the instructor, allowing the instuctor to determine the causes of plagiarism and effect other means of remedy. It is the obligation of the instructor to inform the student that a penalty is being assessed in such cases.

Course Policies

All homeworks are to be completed by each student **individually**. Lab assignments are to be completed by the appropriate units (individual, pair, group), and no code/solution-sharing between units is permitted. Students are encouraged to discuss class content among themselves but NOT in a manner that constitutes plagiarism and cheating as defined above (e.g., you can solve together a problem from the textbook that had not been assigned in the homework, but you should solve assigned problems individually).