CECS 455 Syllabus

Darin Goldstein

1 Contact info

- Office: ECS 546
- Phone: (562)985-1507
- Email: daring90808@gmail.com
- Office hours: 12:30-2:00 PM TTh
- Web page: http://www.csulb.edu/~dgoldst2/
- Term: Fall 2017
- Class Meeting Times: Lecture 10:00-11:00 / Lab 11:00-12:15 PM MW (though lecture will be given during lab time)
- Class Location: VEC 519/ ECS 403
- Textbook: Lecture notes will be made available online. Highly recommended: Game Theory, Alive. Anna R. Karlin and Yuval Peres

An excellent reference on game theory is Games of Strategy (Third Edition) by Avanish Dixit, David Reiley Jr., and Susan Skeath. Another good reference is the recent Algorithmic Game Theory by Nisan, Roughgarden, Vazirani, and Tardos.

1.1 Stuff you should already know

- Mathematical maturity: how to evaluate arithmetic and geometric sums, log rules, limits, derivatives, integrals, Lagrangians, elementary probability, etc.
- Computer science maturity: Absolutely everything from CECS 228/328 including MSTs, network flows, NP-completeness, etc.

2 Objectives

The goal of this course is to (a) familiarize the student with the rudimentary elements of algorithmic game theory and (b) introduce several of the high points in the field.
3 How this course will be graded

There will be a total of 4 programming assignments in this course, each worth 15% of the final grade. There will be one midterm exam worth 20% and a final worth 20%.

Homework will be posted online. These homeworks will not be collected. HOWEVER, I will only assign odd problems for the homeworks. The answers to these problems are given in the back of the book. Please be aware that only the answers are given, not the reasoning. This course has a lab associated with it; the purpose of this lab will be to do the problems in the homework for those who want to see the full reasoning behind the answer.

4 Lectures

Some good news for this course is that you will never be explicitly penalized for missing a lecture. I will never give any pop-quizzes. All graded material is mentioned explicitly somewhere in this syllabus. The final exam date for this course is set by the University (totally independently of me and over which I have absolutely no control) and should be available via the University website.

On the other hand, this is definitely a lecture-based course. If you choose to miss a lecture, I will not penalize you for it or hold it against you in any way, but you are fully responsible for any material that I go over. If I mention something in lecture that is not in the book, YOU ARE STILL RESPONSIBLE FOR KNOWING IT. I will not redo a lecture for people that missed it the first time. It is your responsibility to get the notes/information. If you miss any kind of instructions about assignments that are given during lecture (including but not limited to due dates, methods for submission for assignments, etc.), it is STILL your responsibility to be aware of what occurred in lecture.

5 Withdrawal policy

The University allows a student to withdraw from a class up until a certain date for a “serious and compelling reason” with a professor’s signature. I will sign drop forms that list the following reason: “Inability to complete the coursework.” For this course, that will be the instructor's interpretation of a serious and compelling reason.

6 Programming Assignments

All programming assignments are to be written in Java.

When it comes to questions about the assignment: I will answer any question pertaining to what it is you have to do and no questions about how to do it.

You may not consult with anyone other than me and your textbook about the programming assignments unless otherwise explicitly allowed by me via email. I
will never write code for anyone in the class. All coding will be completely left up to you, and you may not use code written by anyone other than you unless authorized by me via email. IF I FIND OUT THAT COLLABORATION HAS OCCURRED ON ANY PROGRAMMING ASSIGNMENT, THE PENALTY IS AN AUTOMATIC F IN THE COURSE FOR ALL PARTIES INVOLVED REGARDLESS OF WHO DID THE ACTUAL WORK. This policy will be rigidly enforced. It is your responsibility to make sure that nobody is able to copy your work. I recommend never leaving a lab computer unattended, never letting anyone see your code, and always deleting your work from any public computer. (If you need a place to save your work, e-mail it to yourself.) If you suspect that your work is being copied (or cheated off of in any way) by someone else, you may let me know by e-mail BEFORE you turn in the assignment and I will take it into account. However, I will not take into account statements about cheating that do not explicitly identify the cheating party.

I reserve the right to call anyone into my office hours or lab time for any reason to explain any issues with your source code (e.g. if your code does not produce an answer that you submitted, if your code too closely matches that of someone else, etc.). Failure to show up for such a meeting will certainly earn a 0 on the assignment and most likely an F in the course depending on the circumstances (e.g. if I suspect cheating is involved). If a student is unable to adequately explain his/her work on a programming assignment, the grade on the assignment may be reduced appropriately.

Note that there are two types of assignments. Either you will have to (a) have your code solve increasing difficult problem instances or (b) resubmit answers until you reach the grade that you are satisfied with. Almost always, you will need to resubmit multiple times for any given assignment.

The programming assignments will be graded as follows: Each assignment is posted online and you may demonstrate the assignment at any time before the deadline. Once the deadline arrives and you have not demonstrated, your project will receive no credit. You will generate and submit your assignments via the server as follows.

1. Log into the server and enter your section and the assignment you’re interested in.

2. Generate an instance of the problem. Your individual problem will arrive to you via email in an attachment named input.zip. (Make sure that your Beachboard emails are up-to-date. Note that if you add the course after the semester has officially begun, you will need to explicitly inform me via email that you are unable to log into the server so that I can add an account for you.)

3. Solve the problem and generate an answer. Zip up your answer and rename it to output.zip.

4. Log back into the server and submit your answer. Once your answer is checked and verified, you will be notified by email. (Note that you may have to do this step several times.)
5. Once you are satisfied with your grade and have generated and solved as
many instances as necessary, you will zip up all of your source files into
a single zip file named src.zip. (All that is required is to go into your
Java project and literally zip up the src folder.) You will then submit it
via the server page. Do not bother emailing code to me! Only .java files
will be accepted. If your src folder contains anything but .java files, your
submission will be rejected. Any assignment that doesn’t have a valid
code submission by the deadline will be counted as a 0.

The programming assignments will be graded on a scale of 0 to 4. (You can
think of a 4 as an A, 3 as a B, etc.)

IF YOU LEAVE YOUR DEMONSTRATION FOR THE LAST MINUTE,
IT IS VIRTUALLY CERTAIN THAT YOU WILL NOT BE ABLE TO GET
ANY CREDIT FOR THE ASSIGNMENT!!! The server can only handle a
certain load at any given time, and if you leave your demonstrations for the last
minute, the server may be unable to check your submission. This is not the
fault of the server, and you will not receive any credit nor will any extensions
be granted based on the inability of the server to check your assignment. It is
your responsibility to budget the time necessary to check your solutions! Plan
ahead or plan to not get credit.

If you have any questions or comments about the rules, it is your responsibil-
ity to let me know about them IMMEDIATELY so that they can be straightened
out.

Requests for late submissions will not be entertained.

7  Exams

The final exam is at a date and time assigned by the University over which
I have absolutely no control. You may not leave the room during an exam.
During exams, you may not communicate with anyone other than me. You
may not use any communication device (cell phones, etc.) during an exam. In
particular, all cell phones are required to be turned off during an exam. Failure
to observe these rules will result in an F in the course.

The policies I will follow in terms of exam grading are as follows.

• Partial credit will only be given out for steps LEADING TO THE COR-
RECT ANSWER. The answer itself is meaningless without clear reason-
ing. This means that if your reasoning is incorrect or not explicitly on
the page, the ANSWER BY ITSELF WILL NOT BE COUNTED AS
CORRECT.

• Write out every step of your reasoning. If it is not on the page, you will
not get credit for it.

• Clearly mark out anything you don’t want graded. If it is on your page and
not crossed out, it will be graded as if it’s part of your answer. If there is
more than one answer on your page, I WILL GRADE THE INCORRECT ANSWER. Points may be deducted for anything incorrect written on the page that is not crossed out even if the final answer is correct.

- Exam questions are not required to look anything like the homework questions. Exams will be given to test whether you are able to APPLY the knowledge that you have learned.

It is the student’s responsibility to notify the instructor in advance of any need for accommodation of a disability that has been verified by the University.

Your grades will be available on Beachboard as soon as possible after grading has been completed.

8 Cheating

Cheating on any graded material in the course will lead to an automatic grade of F in the course. The University Honors committee will also be notified and ejection from the Honors program is possible/probable. I don’t give warnings.

9 The final word

If there is anything on this page that you have a question or comment about, it is very important to let me know about it on the FIRST DAY OF CLASSES. After the first day of classes, I will assume that you are aware of the grading policies. Any grading misunderstandings you have after the first day of classes are your responsibility. Good luck.

10 Course topics

1. Dominated/dominating strategies
2. Bitcoin I
3. Bitcoin II
4. Bitcoin III
5. Backward induction: Introduction
6. Backward induction I
7. Backward induction II
8. Nash equilibria I
9. Nash equilibria II
10. Nash equilibria III
11. Pareto optimality versus Nash equilibrium
12. Trembling hand stability
13. Correlated equilibria

Midterm
14. Email uncertainty
15. Arrow’s theorem
16. Introduction to mechanism design
17. Gale-Shapley I
18. Gale-Shapley II
19. Gale-Shapley III
20. House Allocation Problem I
21. House Allocation Problem II
22. Price of anarchy/stability
23. Price of anarchy/stability II
24. Yao’s Lemma
25. Yao II
26. Weak to Strong Learning

11 Assignment due dates

In the order they are given, the due dates are as follows: (Because nothing needs to be turned in by hand, all assignments are due on a Friday.)

1. Sept. 21
2. Oct. 13
3. Nov. 3
4. Nov. 24