

Math 5370 (3 credits)
CRN 26825
MW 4:30-5:50, CRBL C201

GAME THEORY
Syllabus

Spring 2019

Instructor: **Dr. Art Duval**

office: **Bell Hall 303**

phone: **747-6846**/office (24hrs./day; if I'm not in, please leave a message)

747-6502/fax (include a cover sheet with my name, please)

545-1788/home (9am–9pm only, please)

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<http://www.math.utep.edu/Faculty/duval/home.html>

Office hours: **Mon, Wed, 10:00–11:00; Tue, Thu, 1:00–2:00**. Please feel free to come by my office any time during scheduled office hours. You are welcome to visit at other times, but in that case you might want to make an appointment, just to make sure that I will be there then. You can make an appointment simply by talking to me before or after class, by calling me at my office or at home, or by sending e-mail.

You may also ask any questions directly via phone or e-mail. If I'm not in when you call, please leave a message on the voice-mail or answering machine with your name, number, and a good time for me to call you back. I will try to respond to your phone or e-mail message as soon as possible.

Website: <http://www.math.utep.edu/Faculty/duval/class/5370/191/home.html>

Here you will find this syllabus with relevant links, including homework and reading assignments for the whole semester, as they are announced. Other resources may become available.

Prerequisites: We will use some calculus, some elementary probability, and some basics of matrix operations. We will also be reading and writing proofs. So you should be comfortable with all of these.

COURSE OBJECTIVES: Upon successful completion of the course, you will be able to set up and perform computations, such as equilibria and strategies on specific games. You will know and understand the theory of zero-sum and non-zero-sum games, and cooperative games, in general. You will be able to prove simple results in game theory. You will be better able to independently read advanced mathematics.

Specific topics include: Combinatorial games, zero-sum games, non-zero-sum games, and Nash equilibria. Cooperative games, and social choice (voting) theory.

Textbook: **Game Theory, Alive**, by **Anna R. Karlin and Yuval Peres**, Chs. **1, 2, 4, 12, 13, and parts of Chs. 3 and 5**. We will skip some sections, as announced in class.

You will spend a substantial amount of time outside of class reading the textbook. The course will be structured to encourage and support you in this endeavor. In-class activities will center around our making use of what you have read outside of class.

GRADES:

Homework and Participation: For each section of material we encounter, there will be three kinds of homework, as follows (more details are on a separate handout):

Advance preparation (10%) You will read the section carefully, write responses to reading questions, create some of your own questions, and reflect. The written part of this assignment will be due *before* we discuss the material in class.

Warmup exercises (10%) On the *day of* our class discussion over the material, we will discuss easier warmup exercises. You will prepare your answers, in writing, before class, and the class will share answers in small groups or whole class discussions.

I expect everyone to attend and participate actively in class, in particular to speak up during class discussion with questions and ideas, and to work well with others. Your active participation in class will constitute a substantial part of this part of your grade for the course.

Main exercises (40%) *After* our class discussion over the material, you will turn in clearly-written solutions to harder homework problems. These will generally be due weekly.

Written assignments (for all three kinds of homework) will not be accepted after they are due, except in extenuating circumstances that you explain to me as soon as possible. Incomplete homeworks will be accepted, though, so please turn in whatever work you have completed when homework is due. You are encouraged to work together on your homework, but you must write up your solutions by yourself.

Exams:

Midterm (15%) The midterm will cover all material we have discussed to that point, and will be on

Wed., 6 Mar.

Final (25%) The final exam will be comprehensive over all material we discuss in class. The final will be on

Mon., 13 May, 4:00–6:45 p.m.

Makeup exams can be given only in extraordinary and unavoidable circumstances, and with advance notice.

Once you begin an exam, you will not be allowed to leave the classroom until you have finished the exam. There will be no bathroom breaks. If you have a medical reason for needing more frequent bathroom breaks, please provide documentation in advance.

POLICIES:

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged scholastic dishonesty to be referred to the Office of Student Conduct and Conflict Resolution for investigation and appropriate disposition. See Section II.1.2.2.1 of the Handbook of Operating Procedures.

Attendance: Due to the course structure, attendance is mandatory. There is no particular penalty for missing a particular class, but you cannot get a good participation grade if you miss too many classes. I will usually “excuse” an absence if you tell me about it in advance, or, in cases of emergencies, as soon as possible afterwards. My goal is for class meetings and activities to complement, rather than echo, the textbook, and thus for every class to be worth attending.

Drop date: The deadline for student-initiated drops with a W is Friday, April 5. After this date, you will not be able to drop the class (as per the Dean’s office). Furthermore, a grade of incomplete is only for extraordinary circumstances, such as a missed exam.

I hope everyone will complete the course successfully, but if you are having doubts about your progress, I will be happy to discuss your standing in the course to help you decide whether or not to drop. You are only allowed three enrollments in this course, and students enrolled after Fall 2007 are only allowed six withdrawals in their entire academic career, so please exercise the drop option judiciously.

Courtesy: We all have to show courtesy to each other, and the class as a whole, during class time. Please arrive to class on time (or let me know when you have to be late, and why); do not engage in side conversations when one person (me, or another student) is talking to the whole class; turn off your cell phone (or, for emergencies, at least set it to not ring out loud), and do not engage in phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148, cass@utep.edu, or Union East room 106. You are responsible for presenting to me any CASS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time, due to exceptional circumstances such as military service and/or training, or childbirth, please let me know as soon as possible.