Statistical Computing - MATH 6382 - 24174
Fall 2016

Instructor:	Tamer Oraby Office: MAGC 3.428 Phone: 665-3536; E-mail: tamer.oraby@utrgv.edu Web Page: https://faculty.utpa.edu/orabytf/
Office hours:	MW 6:00pm – 7:00 pm, TR 5:00 am – 5:30 pm or by appointment
Meeting time and place	TR 5:55 pm – 7:10 pm at Academic Services Building 1.104
Textbook	Statistical Computing with R, by Maria L. Rizzo. Chapman & Hall/CRC.
Additional reading	1) Computational Statistics, by James Gentle. Springer. 2) Handbook of Computational Statistics, Second Edition, editors: Gentle, Hardle, and Mori. Springer.
Software	R (free, download from www.r-project.org/) OpenBUGS (if time allows, free, download from http://www.openbugs.net/w/Downloads)
Course Description	A course in modern computationally-intensive statistical methods including simulation, optimization methods, Monte Carlo integration, maximum likelihood /EM parameter estimation, Markov chain Monte Carlo methods, resampling methods, non-parametric density estimation.
Prerequisite	Consent of instructor.
Homework:	HW will be assigned from textbook and others every few lectures. They could be handed in in class or be submitted through blackboard under the Homework folder in the navigation bar.
Group work:	You are highly encouraged to study and work in teams and solve the problems together. But please submit your own solution and not a copy of someone else's solution. The latter will not be tolerated.
Midterm:	There will be one midterm exam on **Tuesday 10/11/16**.
Final Exam:	A final exam on **Thursday 12/15/16** from **5:45 to 7:30 PM**.
Project:	You teach! S&E SDE, GP, BDA.
Grading policy	Homework 25%, Project 35%; one midterm exam 20%; Final exam 25%.

Grade Distribution:

90-100% : A	70-79% : C	0-59%: F
80-89% : B	60-69% : D	

Attendance   **Attendance is mandatory. You are required to come to all class-meetings unless you are taking this course online; please come on time.**

Special Accommodations:	If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time.
Drop Policy	According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.
Makeup Policy	In case of illness and in rare cases of other conflicts, students with documented excuses may request to take a makeup exam after scheduled exam. In all cases, makeup must be requested before the regularly scheduled exam.

Important Dates		
	September 1	Last day to add or register for Fall classes
	September 1	Last day to withdraw (drop all classes) for a 80% refund
	September 5	Labor Day Holiday; university closed
	September 14	Last day to drop a class before it appears on the transcript and counts toward the "6-drop" limit.
	October 11	Midterm Exam
	November 17	Last day to drop (DR grade) a class or withdraw (W)
	November 24-25	Thanksgiving Holiday; university closed
	December 8	Study Day; no classes
	December 15	Final Exam 5:45 – 7:30 PM

Electronic Communication Policy:	The university policy requires all electronic communication between the University and students be conducted through the official University supplied systems; namely EMail for email or Blackboard for course specific correspondence. Therefore, please use your UTRGV assigned EMail or Blackboard account for all future correspondence with UTRGV faculty and staff.
Mandatory Course Evaluations	**Mandatory Course Evaluations Period (November 18 – December 8).** Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. **Students who complete their evaluations will have priority access to their grades.** Online evaluations will be available Nov. 18 – Dec. 8, 2016.
Scholastic Integrity	As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:	In accordance with UT System regulations, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

Student Learning Outcomes: After completing this course students will be able

1. To use the software R for different computational and numerical procedures with great deal of proficiency.
2. To learn different methods of generating random variables and apply them correctly.
3. To simulate some stochastic processes.
4. To use numerical and optimization methods needed to carry out some statistical computations.
5. To perform Monte Carlo integration of functions and use it in applications.
6. To understand importance and stratified sampling and their application.
7. To perform maximum likelihood and E/M algorithm for different models.
8. To be able to estimate parameters and test hypothesis as well as perform power analysis using Monte Carlo methods.
9. To learn bootstrap and Jackknife procedures and use them to estimate confidence intervals.
10. To learn different Markov Chain Monte Carlo algorithms, and apply them and check out convergence.
11. (If time permits) To learn how to use OpnBUGS.