

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF SCIENCE
DEPARTMENT OF MATHEMATICAL SCIENCES

Course #: STAT 5329
Course Title: Statistical Programming
Credit Hrs: 3.0
Term: Fall 2018
Course Meetings & Location: MW 3:00 – 4:20 pm in Bell Hall Computer Lab
Prerequisite Courses: Department approval required
Course Fee: N/A
Instructor: Dr. Michael Pokojovy
Office Location: Bell Hall 227
Contact Info: Phone: (915) 747-6761
E-mail address: mpokojovy@utep.edu
Fax # 915-747-6502 (Math Department)
Emergency Contact: 915-747-5761 (Math Department)
Office Hrs: MW 1:00 pm – 2:00 pm, by appointment or on a drop-in basis
Textbook(s), Materials: Required: none
Recommended: 1) Delwiche, L.D. and Slaughter, S.J. (2012). The Little SAS Book: A Primer, 5th ed., SAS Institute Inc., Cary, NC
2) SAS Institute (2018). SAS Certification Prep Guide: Base Programming for SAS 9, 4th ed., SAS Institute Inc., Cary, NC
3) Matloff, W. (2011). The Art of R Programming: A Tour of Statistical Software Design, No Starch Press, San Francisco, CA
4) Venebles, W., Smith D. and the R Core Team (2018). Introduction to R, available at cran.r-project.org/doc/manuals/r-release/R-intro.pdf

Course Description and *Contents:*
Learning Outcomes: This course introduces students to the principles and concepts of statistical programming in SAS and R. Students will be able to manipulate data, create summary reports and lists, edit and interactively debug code, manage complex data sets, transform and generate data, create effective graphics for data visualization, create user-defined functions and SAS macros, handle various data formats, and learn the fundamentals of resampling methods in SAS and R.

Course Activities/Assignments: Each class period will have in-class work completed within the period. Additionally, bi-weekly assignments will be given. A midterm and final exam will also be administered during the semester.

Assessment of Course Objectives: A grading rubric will be used for the bi-weekly assignments. There will be a mid-term and final in-class exam. Daily in-class assignments are graded for completeness only. There is a minimum score (40%) that you are expected to obtain on both the midterm and final exams. If the mean of both exams does not exceed 40%, then the homework grade will be dropped from your course grade.

Course Schedule: Important dates:

- Duration: 8/27/2018 – 12/5/2018
- Midterm exam: Week 8
- Final exam: Mon, 12/10/2018 at 1:00 pm – 3:45 pm
- Course drop deadline: Fri, 11/2/2018 (No “W” are guaranteed for dropping the course after this date!)
- Grades officially available online: Wed, 12/19/2018

Tentative schedule:

Week 1: Getting Started in SAS; SAS syntax

Week 2: SAS Data Sets

Week 3: Reading in Data; Validating and Cleaning Data

Week 4: Manipulating Data; Combining Data; SAS reports

Week 5: Input and outputting Data; Processing and Restructuring Data

Week 6: Combining Data v2; SAS Macros

Week 7: Extra SAS topics or handling simulations in SAS

Week 8: R Intro, help and packages & *Midterm exam* (in-class)

Week 9: vectorized calculations, matrices and arrays

Week 10: lists and data frames, programming structures

Week 11: simulations and efficient programming

Week 12: permuting and bootstrapping

Week 13: creating R functions (packages?)

Week 14: final topics & *Final exam*

- Grading Policy: 5% In-class assignments, turned in occasionally
25% Two midterm exams (there is an in-class and take-home portion)
25% Final exam (there is an in-class and take-home portion)
45% Weekly homework assignments

The usual grading scale will be used for this course (90–100% = A, 80–89% = B, 70–79% = C, 60–69% = D, 0–59% = F). Academic performance in this class will be the only factor used in determining the course grade. No extra credit work will be available to improve on any grade.

- Make-up Policy: If class is missed for a valid and documented reason (as deemed by the instructor) and the instructor is informed beforehand, the daily in-class assignments may be made-up for full credit. All other assignments must be turned in on time.

- Attendance Policy: You are expected to attend class so that you may turn in the in-class assignments and bi-weekly homework assignments. Late arrivals are not permitted. Eight absences without prior notice and justification will result in student’s drop from the class list with an “F.” Being late by 10 minutes or more or leaving the classroom before the class is dismissed will be considered an absence.

Academic Integrity Policy: The University policy is that all suspected cases or acts of alleged scholastic dishonesty must be referred to the OSCCR for investigation and appropriate disposition. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the 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. Each student is responsible for notice of and compliance with the provisions of the Regents' Rules and Regulations, which are available for inspection electronically at <http://www.utsystem.edu/bor/rules/homepage.htm>

All students are expected and required to obey the law, to comply with the Regents' Rules and Regulations, with System and University rules, with directives issued by an administrative official in the course of his or her authorized duties, and to observe standards of conduct appropriate for the University. A student who enrolls at the University is charged with the obligation to conduct himself/herself in a manner compatible with the University's function as an educational institution.

Any student who engages in conduct that is prohibited by Regents' Rules and Regulations, U. T. System or University rules, specific instructions issued by an administrative official or by federal, state, or local laws is subject to discipline, whether such conduct takes place on or off campus or whether civil or criminal penalties are also imposed for such conduct.

Civility Statement: This is a class where participation is required. You will be seated in front of a computer all class period and you are expected to follow the lecture/discussion and at various times complete in-class assignments. You are not allowed to browse the Internet during class time or work on any other material. If you regularly do not complete in-class assignments in a satisfactory manner, participate in class, or if you work on other material in class you will have points deducted from your in-class assignments portion of your grade.

Please do not use cell phones, iPods, MP3 players, blue tooth devices, etc. during class. Cell phones and pagers should be set to silent or vibrate, and any calls should be taken outside of class. Please do not wear headsets or blue tooth devices during class. Please don't talk in class. Cell phone calculators may not be used on quizzes or exams. Active participation in class is expected, teamwork in class will be implemented.

Disability Statement: If a student has or suspects she/he has a disability and needs an accommodation, he/she should contact The Center for Accommodations and Support services (CASS) at 747-5148 or at <cass@utep.edu> or go to Room 106 Union East Building. The student is responsible for presenting to the instructor any CASS accommodation letters and instructions.

Military Statement: If you are a military student with the potential of being called to military service and/or training during the semester, please contact me by the end of the first week of class

College of Science Policies: All grades of Incomplete must be accompanied by an Incomplete Contract that has been signed by the instructor of record, student, Department Chair, and the Dean. Although UTEP will allow a maximum of one year to complete this contract, the College of Science requests it be limited to month based upon completion data. A grade of Incomplete is only used in extraordinary circumstances confined to a limited event such as a missed exam, project, or lab. If the student has missed a significant amount of work (e.g., multiple assignments or tasks), a grade of Incomplete is not appropriate or warranted.

Disclaimer:

This syllabus may be subject to changes if these are deemed necessary by the instructor.
Despite of all efforts, this syllabus may contain typos and mistakes.

Appendix: Summary of Grading Criteria

Criterion	Approx. % of Grade	Excellent (100%)	Adequate (80%)	Poor (60%)	Not Met (0%)
Program Specifications / Correctness	50%*	No errors, program always works correctly and meets the specification(s).	Minor details of the program specification are violated, program functions incorrectly for some inputs.	Significant details of the specification are violated, program often exhibits incorrect behavior.	Program only functions correctly in very limited cases or not at all.
Readability	20%	Code is clean, understandable, and well-organized.	Minor issues with consistent indentation, use of whitespace, variable naming, or general organization.	At least one major issue with indentation, whitespace, variable names, or organization.	Major problems with at three or four of the readability subcategories.
Documentation	5%	Code is well-commented.	One or two places that could benefit from comments are missing them or the code is <i>overly</i> commented	File header missing, complicated lines or sections of code uncommented or lacking meaningful comments.	No file header or comments present.
Code Efficiency	20%	Code uses the best approach in every case.	Code uses poorly-chosen approaches (though correct in result) in at least one place.	Code uses poorly-chosen approaches (though correct in result) in at least two places.	Many things in the code could have been accomplished in an easier, faster, or otherwise better fashion.
Assignment Specifications	5%	No errors	Minor details of the assignment specification are violated, such as files named incorrectly or extra instructions slightly misunderstood.	Minor details of the assignment specification are violated, such as files named incorrectly or extra instructions significantly misunderstood.	Significant details of the specification are violated, such as extra instructions ignored or entirely misunderstood.