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

Course #: STAT 4370  
Course Title: Statistical Programming  
Credit Hrs: 3  
Term: Spring 2020  
Course Meetings & Location: Online and in class exams  
Prerequisite Courses: Department Approval Required  
Course Fee: (if applicable) NA  
Instructor: Amy Wagler  
Office Location: Bell Hall 311  
Contact Info:  
744-6847 # Phone number  
awagler2@utep.edu E-mail address  
744-6502 Fax #  
Office Hrs: TBA  
Textbook(s), Materials:  
Required: none  
Suggested: The Art of R Programming, Matloff  
Primer on Scientific Programming with Python, Hans Petter Langtangen  

Course Objectives (Learning Outcomes): Introduces students to the principles and concepts of programming in R and Python. 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, handle various data formats, and learn the fundamentals of resampling methods in R and Python.  

Course Activities/Assignments: Each week will require in-class work completed by the end of the week. Additionally, tri-weekly assignments are given. A midterm for R and final exam for Python will also be administered during the semester.  

A grading rubric will be used for the tri-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:

Week 1: R Intro, help and packages
Week 2: vectorized calculations, matrices and arrays
Week 3: lists and data frames, programming structures
Week 4: simulations and efficient programming
Week 5: permuting and bootstrapping
Week 6: creating R functions (packages)
Week 7: final topics and MIDTERM EXAM (in class)
Week 8: Python Introduction: basics, variables, and operators
Week 9: Loops and conditionals
Week 10: Functions and Data Visualization
Week 11: Lists, Strings and Tools for Statistical Modeling
Week 12: Stings and Control flow
Week 13: File I/O and Modules
Week 14: Analysis of algorithms and FINAL EXAM (in class)

Grading Policy:

20% Weekly Lab assignments
20% Midterm Exam (there is an in-class and take-home portion)
20% Final Exam (there is an in-class and take-home portion)
40% Homework Assignments (about 5)

Make-up Policy: If the class is missed for a valid and documented reason, 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 homework assignments.

Academic Integrity Policy: Please see http://academics.utep.edu/Default.aspx?tabid=23785

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 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.

Disability Statement: If a student has or suspects she/he has a disability and needs an accommodation, he/she should contact the Disabled Student Services Office (DSSO) at 747-5148 or at <dss@utep.edu> or go to Room 106 Union East Building. The student is responsible for presenting to the instructor any DSS 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 course of the semester, you are encouraged to contact me as soon as possible.

UTEP College of Science Policies: The UTEP Spring 2017 drop deadline is February 26, 2018. The College of Science will remain aligned with the University and not approve any drop requests after that date.

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