

**Department of Computer & Electrical Engineering
and Computer Science
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours		
Tools for Data Science - CAP 2751		3 credit hours
2. Course prerequisites, co-requisites, and where the course fits in the program of study		
Prerequisites: None		
3. Course logistics		
Term: Fall 2020 TBA		
4. Instructor contact information		
<i>Instructor's name</i>	Dr. Michael DeGiorgio	
<i>Office address</i>	EE 418 (Engineering East (96) building)	
<i>Office Hours</i>	TBA	
<i>Contact telephone number</i>	561-297-003	
<i>Email address</i>	mdegiorg@fau.edu	
5. TA contact information		
<i>TA's name</i>	TBA	
<i>Office address</i>		
<i>Office Hours</i>		
<i>Contact telephone number</i>		
<i>Email address</i>		
6. Course description		
This course will focus on data manipulation, curation, visualization, exploration, interpretation, and modeling using standard packages and tools employed in the field of data science, as well as best practices for maintaining data and software using version control.		
7. Course objectives/student learning outcomes/program outcomes		
<i>Course objectives</i>	<p>In this course, students will:</p> <ol style="list-style-type: none"> 1. Apply packages in the R software suite that are commonly used in data science to manipulate, curate, visualize, explore, and model data. 2. Identify patterns and draw conclusion from visualized data. 3. Employ best practices when processing data ranging from small clean datasets to large messy datasets, while effectively maintaining data and software through GitHub. 	
<i>Student learning outcomes & relationship to ABET objectives</i>	This course will satisfy ABET 2, 4, and 6.	
8. Course evaluation method		
Homework assignments	40%	<ul style="list-style-type: none"> ○ Homework assignments will consist of the R suite of packages and tools to manipulate, curate, visualize, explore, and model data. ○ Exams will focus on key concepts revolving around data interpretation and manipulation.
Midterm exam 1	20%	
Midterm exam 2	20%	
Final exam	20%	

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9. Course grading scale
Grading Scale: 93 and above: "A", 90-92: "A-", 87-89: "B+", 83-86: "B", 80-82: "B-", 77-79: "C+", 73-76: "C", 70-72: "C-", 67-69: "D+", 63-66: "D", 60-62: "D-", 59 and below: "F."
10. Policy on makeup tests, late work, and incompletes
<i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements. <i>Late assignments</i> will be graded with a penalty of 10% of the maximum possible grade for each day after the assignment's due date, up to a maximum of 3 days late (i.e., 30% penalty), beyond which the assignment will receive a grade o (zero). <i>Incomplete grades</i> are given only if there is solid evidence of medical or otherwise serious emergency situation <u>and</u> the student is currently passing the class.
11. Special course requirements
N/A
12. Classroom etiquette policy
Students are required to comply with all requirements specified in the student code of conduct and not in any way disrupt the class or prevent other students from benefiting from the class. Students are to speak and behave respectfully to each other and to all FAU faculty and staff.
13. Attendance policy statement
Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.
14. Disability policy statement
In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/ .
15. Counseling and Psychological Services (CAPS) Center

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Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

16. Code of Academic Integrity policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#). If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy—but be sure the college policy does not conflict with the University Regulation.

17. Required texts/reading

Textbooks (**REQUIRED**):

1. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*, by Hadley Wickham and Garrett Grolemund. O'Reilly, 2017, ISBN-13: 978-1491910399.
2. *ggplot2: Elegant Graphics for Data Analysis*, by Hadley Wickham. Springer, 2009, ISBN-13: 978-0387981406.

18. Supplementary/recommended readings

Additional reading materials will be provided during the semester.

19. Course topical outline, including dates for exams/quizzes, papers, completion of reading

1. Introduction to R and RStudio (weeks 1 and 2)
2. Working with packages (week 3)
3. Data visualization with `ggplot2` (weeks 4 and 5)
4. Data transformation with `dplyr` (weeks 5 and 6)
5. Exploratory data analysis with `ggplot2` and `dplyr` (weeks 7 and 8)
6. Version control with GitHub (week 9)
7. Manipulating and tidying tables with `tibble` and `tidyr` (week 10)
8. Processing relational data with `dplyr` (weeks 11 and 12)
9. String processing with `stringr` (weeks 12 and 13)
10. Manipulating dates and times with `lubridate` (week 13)
11. Modeling basics with `modelr` (weeks 14 and 15)