

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Undergraduate Programs	UUPC Approval <u>10-11-21</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Electrical Engineering and Comp Science College Engineering and Computer Science	
Current Course Prefix and Number CAP 4773	Current Course Title Introduction to Data Science and Analytics	
<i>Syllabus must be attached for ANY changes to current course details. See Checklist. Please consult and list departments that may be affected by the changes; attach documentation.</i>		
Change title to: Change prefix From: _____ To: _____ Change course number From: _____ To: _____ Change credits* From: _____ To: _____ Change grading From: _____ To: _____ Change WAC/Gordon Rule status** Add <input type="checkbox"/> Remove <input type="checkbox"/> Change General Education Requirements*** Add <input type="checkbox"/> Remove <input type="checkbox"/> <small>*Review Provost Memorandum</small> <small>**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See WAC Guidelines.</small> <small>***General Education criteria must be indicated in syllabus and approval attached to this form. See GE Guidelines.</small>	Change description to: Change prerequisites/minimum grades to: (COP 2220 or COP 2034) and (EEE 4541 or STA 4821 or STA 2023) or permission of instructor with a "C" or better Change corequisites to: Change registration controls to: Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).	
Effective Term/Year for Changes: Spring 2022	Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Hanqi Zhuang, zhuang@fau.edu, 561-297-3413		
Approved by Department Chair _____ College Curriculum Chair <u>Dan Meeroff</u> College Dean <u>Fred Bloetscher</u> UUPC Chair <u>Dan Meeroff</u> Undergraduate Studies Dean <u>Edward Pratt</u> UFS President _____ Provost _____	Date _____ 9/23/2021 _____ 10-4-21 _____ 10-4-21 _____ 10-11-21 _____ 10-11-21 _____ _____	

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

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

1. Course title/number, number of credit hours	
Introduction to Data Science and Analytics - CAP 4773	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: (COP 2220 or COP 2034) and (EEE 4541 or STA 4821 or STA 2023) or permission of instructor with a "C" or better	
3. Course logistics	
Term: TBD Class location and time:	
4. Instructor contact information	
Instructor's name Office address Office Hours Contact telephone number Email address	TBD
5. TA contact information	
TA's name Office address Office Hours Contact telephone number Email address	TBD
6. Course description	
This course deals with the principles of data science and analytics. Topics covered include statistical analysis of data, measurement techniques and tools, machine learning methods, knowledge discovery and representation, and classification and prediction models.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	In this course, students will: <ol style="list-style-type: none"> Learn fundamental principles of data science and its applications Use R programming to wrangle, visualize, and explore data Apply a variety of statistical learning techniques to data in R Write a report describing findings of a data analysis project
Student learning outcomes & relationship to ABET 1-7 outcomes	Upon successful completion of this course, students will be able to: <ol style="list-style-type: none"> Define and differentiate key terminology in data science (ABET 1) Perform data wrangling, visualization, and exploration in R (ABET 1) Apply a diversity of statistical learning techniques in R (ABET 1) Select appropriate statistical learning techniques to address targeted questions (ABET 6) Present interpretations of findings in a written report (ABET 6) ABET Outcomes:

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

	<ol style="list-style-type: none"> 1. An ability to identify, formulate, and solve complex computing/engineering problems by applying principles of computing, engineering, science, and mathematics (Problem solving) 6. An ability to apply engineering/computer science theory and hardware/software development fundamentals to develop and conduct appropriate experimentation, analyze and interpret data, and use computing/engineering judgment produce engineering/computing-based solutions/conclusions (Experimentation and/or simulation) 	
8. Course evaluation method		
Homework (5 total, 15% each)	75%	Hands-on data analysis in R
Final paper	25%	Written report of a data analysis project
9. Course grading scale		
A [90-100]	A- [87-90]	B+ [83-87]
B [80-83]	B- [77-80]	C+ [73-77]
C [70-73]	C- [67-70]	D+ [63-67]
D [60-63]	D- [51-60]	F [0-51]
10. Policy on makeup tests, late work, and incompletes		
<p>Late Assignments Policy –</p> <p>Make-up Policy for Tests: Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from participating in the exam.</p> <p>Incomplete Grade Policy Incomplete grades are against the policy of the department. Unless there is solid evidence of a medical or otherwise serious emergency situation and the student is currently passing the class, incomplete grades will not be given.</p>		
11. Special course requirements		
N/A		
12. Classroom etiquette policy		
To enhance and maintain a productive atmosphere for learning, personal communication devices such as cell phones are to be disabled during class sessions.		
13. Attendance policy statement		
<p>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. After two full weeks of face to face instruction with consecutive 'no show' of any students in person in the classroom, the modality of this course section may be changed to remote instruction only at the discretion of the university.</p> <p>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</p>		

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

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 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

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](#).

17. Required texts/reading

Textbook: An Introduction to Statistical Learning. Gareth James, Daniella Witten, Trevor Hastie, and Robert Tibshirani, 2017, Springer, ISBN-13: 978-1461471370

18. Supplementary/recommended readings

TBD

19. Course topical outline (and associated readings)

- Data wrangling and exploration
 - Data visualization
 - Data transformations
 - Exploratory data analysis
- Supervised learning with linear models
 - Linear regression and hypothesis testing
 - Logistic regression for classification
- Model and feature selection
 - Cross-validation
 - Regularization
- Supervised learning with nonlinear models
 - Tree-based methods for regression and classification
- Unsupervised learning

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

- o Dimensionality reduction with principal components analysis
- o Prototype clustering with K-means clustering
- o Hierarchical clustering