

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

1. Course title/number, number of credit hours	
Introduction to Data Science and Analytics CAP4773	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: COP 3530 Data Structures and Algorithm Analysis and STA 4821 Stochastic Models for Computer Science with minimum grade of C; or permission of the instructor.	
3. Course logistics	
<i>Term:</i> This is a classroom lecture course. <i>Class location and time:</i>	
4. Instructor contact information	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Taghi M Khoshgoftaar., Professor Engineering East Bldg., Room 511 TBA 561-297-3994 khoshgof@fau.edu
5. TA contact information	
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, classification and prediction models.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	To enable students to understand basic concept of data science and analytics tools and techniques with an emphasis on real world applications.
<i>BSCS program outcomes</i>	Proficiency in the areas of data science, data analytics and machine learning.
8. Course evaluation method	
Homework assignments worth 50% total Course project 20% Exam 30%	
9. Course grading scale	
Grading Scale: 90 and above: "A", above 85 but below 90: "B+", 80-85: "B", above 75 but below 80: "C+", 70-75: "C", above 65 but below 70: "D+", 60-65: "D", above 55 but below 60: D-, 55 and below: "F."	

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10. Policy on makeup tests, late work, and incompletes

Assignments are to be submitted on time, with possible point penalties for late submissions. In no case will an assignment be accepted after the graded papers for that assignment have been returned to the students. However, appropriate accommodations will be made for students having a valid medical excuse for being unable to work on an assignment during its two week period.

Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.

11. Special course requirements

NA

12. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones, are to be disabled in class sessions, and laptops are only to be used for note taking and related activities.

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

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

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<http://www.fau.edu/counseling/>.

16. Honor code policy

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 unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

17. Required texts/reading

- (1) Data Mining: Practical Machine Learning Tools and Techniques, by I.H. Witten and E. Frank
- (2) Python for Data Analysis, by Wes McKinney
- (3) Selected articles and papers are posted on the course web site or CANVAS.

18. Supplementary/recommended readings

NA

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

Topics:

1. Introduction --- Data science and analytics (week 1)
2. Input: Concepts, instances, attributes (week 1)
3. Output: Knowledge representation (week 2)
4. Algorithms: The basic methods (week 3-4)
5. Divide and conquer: Constructing decision trees (week 4)
6. Credibility: Evaluating what's been learned (week 5)
7. Introduction to Weka (JAVA based machine learning tool), R and Scikit-learn (machine learning in Python) – (week 6-7)
8. Implementations: Real machine learning schemes (week 7)
9. Regression models for numeric prediction (week 8-9)
10. Introduction to experimental design (week 10)
11. One-factor and two-factor designs (week 10-12)
12. Case studies (week 13)
13. Project presentations by students (week 14-15)