

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____
	Department Computer and Electrical Eng. and Comp. Sci. College Engineering and Computer Science		
Current Course Prefix and Number CAP 5625		Current Course Title Computational Foundations of Artificial Intelligence	
<i>Syllabus must be attached for ANY changes to current course details. See Guidelines. 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: _____ Academic Service Learning (ASL) ** Add <input type="checkbox"/> Remove <input type="checkbox"/>		Change description to: Change prerequisites/minimum grades to: COP 2220 or COP 2034 or permission of the instructor Change corequisites to: Change registration controls to: Graduate Standing or Senior Standing	
* Review Provost Memorandum ** Academic Service Learning statement must be indicated in syllabus and approval attached to this form.		Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
Effective Term/Year for Changes: Fall 2021		Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Hanqi Zhuang, zhuang@fau.edu, 561-297-3413			
Approved by Department Chair _____ Hanqi Zhuang College Curriculum Chair _____ Francisco Presuel-Moreno College Dean _____ <i>McCarder</i> UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date _____ _____ 3/4/2021 _____ _____ _____ _____	
<small>Digitally signed by Hanqi Zhuang Date: 2021.03.04 08:59:28 -05'00'</small>		<small>Digitally signed by Francisco Presuel-Moreno DN: cn=Francisco Presuel-Moreno, ou=Florida Atlantic University, ou=Ocean and Mechanical Engineering, email=fpresuel@fau.edu, c=US Date: 2021.03.04 09:51:35 -05'00'</small>	
<small>Digitally signed by MHeida Carder DN: cn=MHeida Carder, ou=Florida Atlantic University, ou=email-carder@fau.edu, c=US Date: 2021.03.04 13:54:09 -05'00'</small>			

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

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

1. Course title/number, number of credit hours		
Computational Foundations of AI (CAP 5625)	3 credit hours	
2. Course prerequisites, corequisites, and where the course fits in the program of study		
COP 2220 or COP 2034 or permission of the instructor		
3. Course logistics		
Term: TBA Class location and time: TBA		
4. Instructor contact information		
Instructor's name	Michael DeGiorgio	
Office address	Engineering East (Building 96), Room 418	
Office Hours	Thursday 1:30pm-3:30pm and by appointment	
Contact telephone number	561-297-0003	
Email address	mdegiorg@fau.edu	
5. TA contact information		
TA's name	N/A	
Office address	N/A	
Office Hours	N/A	
Contact telephone number	N/A	
Email address	N/A	
6. Course description		
This course covers the mathematical and programming foundations of artificial intelligence (AI) and machine learning (ML) using contemporary programming languages and tools. As a result, students develop familiarity with mathematical methods (and associated notation, software packages and libraries) that are widely used in AI and ML projects and literature.		
7. Course objectives/student learning outcomes/program outcomes		
Course objectives	By the end of the course, students will be able to: Understand the mathematical foundations of machine learning. Demonstrate proficiency in solving machine learning problems. Identify and apply statistical and computational models to machine learning problems. Analyze the performance of particular machine learning models, and justify their use and limitations.	
Student learning outcomes & relationship to ABET 1-7 outcomes	N/A	
8. Course evaluation method		
Two programming assignments	40% (20% each)	
Data analysis assignment with report	30%	
Written survey of special topics	20%	
Presentation of special topic	10%	
9. Course grading scale		
93-100 A	80-82 B-	67-69 D+
90-92 A-	77-79 C+	63-66 D
87-89 B+	73-76 C	60-62 D-
83-86 B	70-72 C-	0-59 F
10. Policy on makeup tests, late work, and incompletes		
Makeup exams 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 exams will be administered and proctored		

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

<p>by department personnel unless there are other pre-approved arrangements <i>Incomplete grades</i> are against the policy of the department, unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.</p>
<p>11. Special course requirements</p>
<p>None</p>
<p>12. Classroom etiquette policy</p>
<p>University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.</p>
<p>13. Attendance policy statement</p>
<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.</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 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.</p>
<p>14. Disability policy statement</p>
<p>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/.</p>
<p>15. Counseling and Psychological Services (CAPS) Center</p>
<p>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/</p>
<p>16. Code of Academic Integrity policy statement</p>
<p>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.</p>
<p>17. Required texts/reading</p>
<p><i>The Elements of Statistical Learning: Data Mining, Inference, and Prediction</i>, by Trevor Hastie, Robert Tibshirani, and Jerome Friedman. Springer, 2009, 2nd Ed, 2009, ISBN-13: 978-0-3878-4857-0. ** Free ebook from author website https://web.stanford.edu/~hastie/ElemStatLearn/</p>
<p>18. Supplementary/recommended readings</p>
<p><i>An Introduction to Statistical Learning: with Applications in R</i>, by Gareth James, Daniela Witten, Trevor</p>

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Florida Atlantic University
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Hastie, and Robert Tibshirani. Springer, 2017, ISBN-13: 978-1-4614-7137-0.

** **Free ebook** from author website <http://faculty.marshall.usc.edu/gareth-james/ISL/>

Pattern Recognition and Machine Learning, by Christopher M. Bishop. Springer, 2006, ISBN-13: 978-0-3873-1073-2.

** **Free ebook** from author website <https://www.microsoft.com/en-us/research/people/cmbishop/>

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

Lecture 1: Introduction

Lecture 2: Linear regression

Lecture 3: Linear and non-linear regression and model selection

Lecture 4: Feature selection and regularization

Lecture 5: Advanced regularization techniques

Lecture 6: Principal components analysis and regression

Lecture 7: Discriminant analysis

Lecture 8: Logistic regression

Lecture 9: Support vector machines

Lecture 10: Neural networks

Lecture 11: Random forests and boosting

Lecture 12: Unsupervised learning

Final lectures: Student presentations on special topics in machine learning

Week 6

Programming assignment 1 due

Week 9

Programming assignment 2 due

Week 12

Report for data analysis assignment due

Week 14

Written survey of special topics due

Week 14 and/or final exam week

Special topic presentations