

 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		Confirmed _____ Banner Posted _____ Catalog _____
Current Course Prefix and Number CAP 5615		Current Course Title Introduction to Neural Networks	
<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: _____ <small>*Review Provost Memorandum</small>		Change description to: Change prerequisites/minimum grades to: COP 3530 Data Structures and Algorithm Analysis Change corequisites to: Change registration controls to: Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
Effective Term/Year for Changes: Fall 2019		Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Dr. Xingquan Zhu / xzhu3@fau.edu / 561-297-3452			
Approved by Nurgun Erdol <small>Digitally signed by Nurgun Erdol DN: cn=Nurgun Erdol, o=FAU, ou=CEECS, email=erdol@fau.edu, c=US Date: 2019.02.01 12:47:42 -0500</small>		Date	
Department Chair _____		_____	
College Curriculum Chair _____		2/4/19	
College Dean _____		2/4/2019	
UGPC Chair _____		2/27/19	
UGC Chair _____		2/27/19	
Graduate College Dean _____		3/1/19	
UFS President _____		_____	
Provost _____		_____	

Email this form and syllabus to UGPC@fau.edu one week before the UGPC meeting.

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

1. Course title/number, number of credit hours	
Introduction to Neural Networks – CAP5615	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisite: COP 3530 (Data Structures and Algorithm Analysis)	
3. Course logistics	
Term: Class location and time:	
4. Instructor contact information	
Instructor's name Office address Office Hours Contact telephone number Email address	Xingquan (Hill) Zhu Engineering East (EE-96) Bldg., Room 509 561-297-3452 xzhu3@fau.edu
5. TA contact information	
TA's name Office address Office Hours Contact telephone number Email address	N/A
6. Course description	
This course teaches students the principles of neural networks, neural network architectures, and learning mechanisms. It also teaches students hands-on experiences in designing/implementing neural networks to solve real-world problems, such as digital character classification or face recognition. Students will learn basic architectures of supervised and unsupervised neural networks and how neural networks can be used for applications such as classification. The course will also cover deep learning networks, and deep learning applications.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	<ol style="list-style-type: none"> 1. Learn fundamental concepts of artificial neural networks, classification models, Bayes networks, and advanced learning framework, such as deep learning. 2. Develop abilities to analyze artificial neural networks. 3. Develop the basic understanding of Back Propagation for weight updating in neural networks. 4. Develop the ability to design basic learning systems.
Student learning outcomes	<ol style="list-style-type: none"> 1. Proficiency in the areas of software design and development, data

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<i>& relationship to ABET objectives</i>	structures, and operating systems 2. An ability to plan and execute an engineering design to meet an identified need																		
8. Course evaluation method																			
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 75%;">Homework</td> <td style="width: 20%; text-align: right;">45%</td> </tr> <tr> <td>2.</td> <td>Mid-Term</td> <td style="text-align: right;">15%</td> </tr> <tr> <td>3.</td> <td>Term Project</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>4.</td> <td>Final Exam</td> <td style="text-align: right;">15%</td> </tr> <tr> <td>5.</td> <td>Student Presentation</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>6.</td> <td>Participation</td> <td style="text-align: right;">5%</td> </tr> </table>		1.	Homework	45%	2.	Mid-Term	15%	3.	Term Project	10%	4.	Final Exam	15%	5.	Student Presentation	10%	6.	Participation	5%
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9. Course grading scale																			
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10. Policy on makeup tests, late work, and incompletes																			
<p><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</p> <p><i>Late work</i> is subject to late penalty.</p> <p><i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of 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																			
<p>All homework assignments and all lab work in this course must be INDIVIDUAL effort. Please take the time to read the documentation. You are responsible for the information outlined in it. Please see the instructor, any teaching assistant, or Engineering Student Services tutoring for assistance. Check the Where to Find Help Section on Blackboard.</p>																			
12. Classroom etiquette policy																			
<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>																			
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.</p>																			

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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 ³ 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 <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. Texts/reading

Textbook:

- [Deep Learning](#), Ian Goodfellow, Yoshua Bengio, and Aaron Courville, The MIT Press, 2016

18. Supplementary/recommended readings

Reference books:

1. [Neural Networks for Pattern Recognition](#), Christopher M. Bishop, Clarendon Press, 1996 (Online version available)
2. [Pattern Recognition and Machine Learning](#) Christopher M. Bishop, Springer, October, 2007, (Online version available)

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

Weekly Schedule	Topics
Week 1	Introduction, R programming
Week 2	Introduction to pattern recognition and machine learning
Week 3	Decision tree learning [homework 1]
Week 4	R for decision tree learning
Week 5	Bayes learning
Week 6	R for Bayes learning [homework 2]
Week 7	Single perceptron learning
Week 8	Multi-layer feedforward neural networks [homework 3]
Week 9	Multi-layer feedforward neural networks for face recognition [mid-term]
Week 10	Radial basis function networks [homework 4]
Week 11	Support vector machines
Week 12	Intro to deep learning [term project]
Week 13	Convolutional neural networks
Week 14	Student presentation
Week 15	Student presentation and review