

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____
	Department CEECS College Engineering and Computer Science		
Current Course Prefix and Number EEL 6682		Current Course Title Intelligent Control	
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.			
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: None Change corequisites to: Change registration controls to:	
* 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: Spring 2021		Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Hanqi Zhuang/zuang@fau.edu/ 297-3413			
Approved by Department Chair _____ Hanqi Zhuang College Curriculum Chair _____ Francisco Presuel-Moreno College Dean _____ <i>McCardi</i> UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date _____ _____ 10/25/2020 _____ _____ _____ _____	

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	
Intelligent Control / EEL 6682	3 # of credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: None	
3. Course logistics	
Term: Class location and time:	
4. Instructor contact information	
Instructor's name Office address Office Hours Contact telephone number Email address	
5. TA contact information	
TA's name Office address Office Hours Contact telephone number Email address	
6. Course description	
Recent trends related to learning and decision-making capabilities of intelligent control systems using neural networks and fuzzy logic. Emphasis on controller design for industrial applications.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	<p>This course aims at providing graduate students a comprehensive view of recent developments in computational intelligent design techniques using neural networks and Fuzzy logic. Various schemes are critically analyzed in order to provide a framework for students' projects. Upon completion of this course, the student should be able to:</p> <ul style="list-style-type: none"> • Know the concept of Neural Network, Fuzzy Logic and Evolutionary Computation (EC). • Learn about the application of NN, FL and EC to industrial process • Design intelligent Systems. • Evaluate the design according to the provided criterions

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

<i>Student learning outcomes & relationship to ABET 1-7 objectives</i>	Upon completion of this course, the student should be able to: <ul style="list-style-type: none"> • Know the concept of Neural Network, Fuzzy Logic and Evolutionary Computation • Learn about the application of NN, FL and EC to industrial process • Design intelligent Systems • Evaluate the design according to the provided criterions 	
8. Course evaluation method		
Computer Projects -	20 %	<i>Note:</i> The minimum grade required to pass the course is C.
Homework -	20 %	
Midterm -	24 %	
Final Examination -	24 %	
Attendance-	12%	
9. Course grading scale		
Grading Scale: 90 and above: "A", 87-89: "A-", 83-86: "B+", 80-82: "B", 77-79: "B-", 73-76: "C+", 70-72: "C", 67-69: "C-", 63-66: "D+", 60-62: "D", 51-59: "D-", 50 and below: "F."		
10. Policy on makeup tests, late work, and incompletes		
-No make-up Test -Student will lose the entire 12 attendance grade points if she/he misses more than 2 classes or discussion sessions		
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 and laptops, are to be disabled in class sessions.		
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		

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

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

Class notes

18. Supplementary/recommended readings

Intelligent Control Systems Using soft Computing Methodologies by Ali Zilouchian and Mo. Jamshidi (recommended, not required)

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

1. Introduction and motivation.
2. Engineering System design: Conventional approaches.
3. Intelligent Control : Needs, Visions and issues.
4. Learning and decision making for intelligent systems
4. Neural Network and Intelligent Control.
5. Supervised and unsupervised learning.
6. Systems modeling using Neural Networks.
7. Industrial applications of Intelligent Control using NN:
 - * *Temperature control system*
 - * *Inverse pendulum balancer*
 - * *Trailer truck Backer-upper*
 - * *Manufacturing*
 - * *Desalination technology*
 - * *Computer Networking*
 - * *Chemical processes*

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

- * *Oil refinery processes*
- * *Aircraft control*
- * *Other industrial applications*

8. Fuzzy Set and Fuzzy logic.

9. Knowledge based motion systems with fuzzy logic.

10. Industrial applications of Intelligent Control fuzzy Logic.

- * *Steam Engine: First Application of Fuzzy Control*

- * *Washing Machine*

- * *Temperature control system*

- * *Inverse pendulum balancer*

- * *Trailer truck Backer-upper*

- * *Servo Motor*

- * *Robot manipulators*

- * *Traffic Flow*

- * *Automatic flight Control*

- * *Subway systems.*

- * *Automatic Focusing Systems*

- * *Car Engine*

11. Combining ANNs and fuzzy logic: trade off and classes of applications.

12. Case studies.