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|  FLORIDA ATLANTIC UNIVERSITY | COURSE CHANGE REQUEST Graduate Programs | | UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner _____ Catalog _____ |
| | Department CEECS College Engineering and Computer Science | | |
| Current Course Prefix and Number CAP 6617 | Current Course Title Sparse Learning | | |
| <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: Graduate standing for CEECS students, and instructor's approval for students from other major. 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: 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 _____ McCardie 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 and Electrical Engineering and Computer Science
Florida Atlantic University
Course Syllabus**

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| 1. Course title/number, number of credit hours | |
| Sparse Learning – CAP 6617 | 3 credit hours |
| 2. Course prerequisites, corequisites, and where the course fits in the program of study | |
| Prerequisites: Graduate standing for CEECS students, and instructor's approval for students from other major. | |
| 3. Course logistics | |
| Term: TBA | |
| Class location and time: TBD | |
| 4. Instructor contact information | |
| <i>Instructor's name</i> | Dr. Hanqi Zhuang |
| <i>Office address</i> | Engineering East (EE-96) Bldg. |
| <i>Office Hours</i> | TBD |
| <i>Contact telephone number</i> | 561-297-3413 |
| <i>Email address</i> | zhuang@fau.edu |
| 5. TA contact information | |
| <i>TA's name</i> | N/A |
| <i>Office address</i> | N/A |
| <i>Office Hours</i> | N/A |
| <i>Contact telephone number</i> | N/A |
| <i>Email address</i> | N/A |
| 6. Course description | |
| This course introduces new concepts, theory, algorithms and applications of sparse representation and modeling, and their relationship with deep learning. Topics covered include mathematical preliminaries, L1 optimization, pursuit algorithms, sparse representation classifiers, sparse dictionary learning, sparse deep learning and applications. | |
| 7. Course objectives/student learning outcomes/program outcomes | |
| <i>Course objectives</i> | The goal of this class is for students to gain theoretical foundation and hands-on experiences on sparse learning. At the end of the class, students should be able to understand the fundamentals of sparse dictionary learning and sparse deep learning, algorithmic and implementation details and should be able to apply sparse models to their research problems. |
| 8. Course evaluation method | |
| Homework set 1- | 15% |
| Homework set 2- | 15% |

**Department of Computer and Electrical Engineering and Computer Science
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| Middle term project - | 35% |
| Final project - | 35% |

In the middle term project, students will apply Sparse Representation Classifier for an object recognition task. In the final project, each of the students will design a sparse deep neural network for an application of the choice.

9. Course grading scale

Grading Scale:
90 and above: "A", 85-89: "A-", 76-84: "B+", 70-75: "B", 66-74: "C+", 60-65: "C", 50-59: "D", 49 and below: "F."

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

No makeup tests will be given, except with documentation from a Doctor. Late assignments will only be accepted and graded, if excused by me. Blackboard will allow you to submit an assignment after the due date and time. However, Blackboard will mark a late assignment late. Incomplete grades will only be given if the student is passing the class and has proper documentation for the reason of the incomplete.

11. Special course requirements

None

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

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/

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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

Sparse and Redundant Representations from Theory to Applications in Signal and Image Processing, Michael Elad, Springer 2010.

18. Supplementary/recommended readings

None

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

Topics

1. Introduction (week 1)
2. Mathematical Preliminaries (week 2-3)
3. Basics of Sparse Representation (week 4)
4. Lo and L1 Optimization (week 5)
5. Optimization Algorithms (weeks 6-7)
6. Sparse Representation Classifier (week 8)
7. Dictionary Learning (weeks 9-10)
8. From Sparse Learning to Deep Learning (weeks 11-12)
9. Sparse Transfer Learning (week 13)
10. Case Studies (weeks 14-15)