FAU

FLORIDA ATLANTIC UNIVERSITY

NEW COURSE PROPOSAL
Graduate Programs

Department CEECS

College College of Engineering and Computer Science
(To obtain a course number, contact erudolph@fau.edu)

UGPC Approval _____
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner Posted _____
Catalog _____

Prefix CAP **Number** 6683	*(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)* **Lab Code**	**Type of Course** Lecture	**Course Title** Artificial Intelligence in Medicine and Healthcare

| **Credits** *(Review Provost Memorandum)*

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Effective Date *(TERM & YEAR)*
Fall 2019 | **Grading** *(Select One Option)*

Regular ⦿

Sat/UnSat ◯ | **Course Description** *(Syllabus must be attached; see Guidelines)*
This course introduces the underlying concepts, methods, and the potential of intelligent systems in medicine. It explores the application of artificial intelligence (AI) and machine learning methods, techniques, and tools to specific areas in medicine and healthcare. As a research and project-based course, students will have opportunities to identify and specialize in particular AI methods, clinical/healthcare applications, and relevant tools. |

Prerequisites Graduate standing or permission of instructor	**Corequisites** N/A	**Registration Controls** *(Major, College, Level)* Graduate Students in the College of Engineering & Computer Science

Prerequisites, Corequisites and Registration Controls are enforced for all sections of course

Minimum qualifications needed to teach course: Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.)	**List textbook information in syllabus or here** Artificial Intelligence in Medical Imaging, by Erik R. Ranschaert, Sergey Morozov, Paul Algra. 2019 Springer - ISBN-13: 978-3319948775.
Faculty Contact/Email/Phone Oge Marques/omarques@fau.edu/(561) 297-3857	**List/Attach comments from departments affected by new course** College of Medicine

Approved by		**Date**
Department Chair	_(signature)_	3/8/19
College Curriculum Chair	_(signature)_	3/11/19
College Dean	_(signature)_ MCardu	3/11/2019
UGPC Chair	_(signature)_	3/27/2019
UGC Chair	_(signature)_	3/27/19
Graduate College Dean	_(signature)_ Khaled Sobh	3/27/2019
UFS President		
Provost		

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

GRADUATE COLLEGE

MAR 1 2 2019

Received

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

1. Course title/number, number of credit hours	
Artificial Intelligence in Medicine and Healthcare – CAP 6683	3 credit hours

2. Course prerequisites, corequisites, and where the course fits in the program of study

Graduate standing or permission of instructor

3. Course logistics

Term: Fall 2019
Room: TBD;
Time: TBD;
Final Exam: TBD

4. Instructor contact information

Instructor's name	Oge Marques
Office address	Engineering East (EE-96) Bldg., Rm. 441
Office Hours	TBD
Contact telephone number	(561) 297-3857
Email address	omarques@fau.edu

5. TA contact information

TA's name	TBD
Office address	TBD
Office Hours	TBD
Email address	TBD

6. Course description

This course introduces the underlying concepts, methods, and the potential of intelligent systems in medicine. It explores the application of artificial intelligence (AI) and machine learning methods, techniques, and tools to specific areas in medicine and healthcare. As a research and project-based course, students will have opportunities to identify and specialize in particular AI methods, clinical/healthcare applications, and relevant tools.

7. Course objectives/student learning outcomes/program outcomes

Course objectives	By the end of the course, students will be able to:
	1. Understand models of human and artificial intelligence, specifically computational models of intelligence.
	2. Identify and apply appropriate intelligent system models and computational tools to specific problems in medicine and healthcare.
	3. Analyze the performance of specific AI and machine learning models as applied to biomedical problems and justify their use and limitations.
	4. Effectively communicate and disseminate knowledge in any science or engineering domain in the context of computing, systems, and/or biomedical applications.

8. Course evaluation method

Project: 60%; Paper reviews and research critiques (3): 30%; Quizzes (2): 10%
A semester-long project will involve identification of method(s) and a biomedical problem of interest, selection of appropriate tools and datasets, systematic review of pertinent literature, application and evaluation of the methodology, interpretation of results, and development of a comprehensive research manuscript. Students will also read, summarize, critique, and discuss relevant scholarly papers assigned by the instructor.

9. Course grading scale

Grading Scale:
90 and above: "A", 86-89: "A- ", 82-85: "B+", 80-83: "B", 76-79: "B- ", 72-75: "C+", 68-71: "C", 64-67: "C-", 60-63: "D+", 56-59: "D", 52-55: "D- ", 51 and below: "F."

GRADUATE COLLEGE

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CAP 6683 Artificial Intelligence in Medicine and Healthcare
Fall 2019
Dr. Oge Marques

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 by department personnel unless there are other pre-approved arrangements

Incomplete grades 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.

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. 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)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585) —and follow all SAS procedures.

14. 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

15. Counseling and Psychological Services 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. Required texts/reading

Artificial Intelligence in Medical Imaging, by Erik R. Ranschaert, Sergey Morozov, Paul Algra. 2019 Springer - ISBN-13: 978-3319948775.

17. Course topical outline

DATE	TOPIC
Week 1	-Course Introduction -Unique characteristics and challenges in medicine and healthcare - History and status quo of intelligent and expert systems in medicine -Paper Review Assignment (PRA) 1 posted
Week 2	- Risk stratification, patient outcome prediction, disease progression modeling -Project posted
Week 3	- Clinical decision-making and intelligent systems to support evidence-based medicine -PRA 1 due; PRA 2 posted
Week 4	- Phenotype and clinical/bio-marker discovery and their relevance to personalized medicine
Week 5	- Tools and technologies for implementing AI methods -PRA 2 due; PRA 3 posted

Week 6	- Tools and technologies for implementing AI methods - Project Milestone 1 (progress update)
Week 7	- How to develop AI applications -PRA 3 due
Week 8	- How to develop AI applications -Quiz 1
Week 9	- Deep learning and machine learning in biomedical imaging
Week 10	- Deep learning and machine learning in biomedical imaging - Project Milestone 2 (progress update)
Week 11	- The role of medical image computing and machine learning in healthcare
Week 12	- Artificial intelligence in medicine: validation and study design
Week 13	- The role of AI in clinical trials - Project Milestone 3 (progress update)
Week 14	- Ethical, legal, and social issues of AI in medicine and healthcare
Week 15	- Ethical, legal, and social issues of AI in medicine and healthcare - Project due
Final Exam	Quiz 2

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March 12, 2019

To Whom It May Concern:

This letter affirms that the Charles E. Schmidt College of Medicine has no objections or concerns related to the proposal for a new course, CAP 6683 - Artificial Intelligence in Medicine and Healthcare, for the upcoming Master's in Artificial Intelligence in the College of Engineering and Computer Science and that it does not present any conflict with our college's curriculum.

We believe this is a timely and relevant topic and wish Dr. Marques and his colleagues success with the new course.

Thank you,

Phillip M. Boiselle, MD
Dean and Professor