

 FLORIDA ATLANTIC UNIVERSITY	NEW/CHANGE PROGRAM REQUEST Graduate Programs	UGPC Approval _____ UFS Approval _____ Banner _____ Catalog _____
	Department Computer and Electrical Eng and Computer Science College Engineering and Computer Science	
Program Name Minor in Artificial Intelligence	<input checked="" type="checkbox"/> New Program* <input type="checkbox"/> Change Program*	Effective Date <i>(TERM & YEAR)</i> Spring 2021
<p>Please explain the requested change(s) and offer rationale below or on an attachment.</p> <p>We are proposing a minor in Artificial Intelligence (AI) which is open to all graduate students at Florida Atlantic University who are not majoring in Artificial Intelligence. The minor has four graduate-level courses (12 credits) and it is structured into two tracks: Development track and Applications track. The Development track is intended for students proficient in programming who will develop new algorithms and mechanisms in AI. The Applications track is open to the students who have introductory programming skills are interested to learn how to use the tools and algorithms of AI. Please see the catalog entry for more details.</p>		
<p><small>*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.</small></p>		
Faculty Contact/Email/Phone Dr. Hanqi Zhuang/Zhuang@fau.edu/561-297-3413	Consult and list departments that may be affected by the change(s) and attach documentation Mathematical Sciences, ITOM, School of Comm. and Multimedia Studies	
Approved by Department Chair <u>Hanqi Zhuang</u> College Curriculum Chair <u>Ramesh Teegavarapu</u> College Dean <u>Mihaela Cardei</u> UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____	<small>Digitally signed by Hanqi Zhuang DN: cn=Hanqi Zhuang, o=FAU, ou=CEECS, email=zhuang@fau.edu, c=US Date: 2020.06.11 17:03:29 -0400</small> <small>Digitally signed by Ramesh Teegavarapu DN: cn=Ramesh Teegavarapu, o=Florida Atlantic University, ou=Civil, Environmental and Geomatics Engineering, email=teegava@fau.edu, c=US Date: 2020.06.12 07:26:17 -0400</small> <small>Digitally signed by Mihaela Cardei DN: cn=Mihaila Cardei, o=Florida Atlantic University, ou, email=cardei@fau.edu, c=US Date: 2020.06.14 15:14:22 -0400</small>	Date <u>6/11/2020</u> <u>6/12/2020</u> <u>6/14/2020</u> _____ _____ _____ _____

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

Minor in Artificial Intelligence

The minor in Artificial Intelligence (AI) is open to all graduate students at Florida Atlantic University who are not majoring in Artificial Intelligence. The minor is awarded upon graduation from a graduate program at FAU; it is not awarded independently of these degrees.

Requirements for the minor include completion of four graduate-level courses (12 credits) with an average grade of B or better. This minor requires 4 courses which have not been counted in any other minor or certificate within the College of Engineering and Computer Science.

The minor has two tracks: Development track and Applications track. The Development track is intended for students proficient in programming who will develop new algorithms and mechanisms in AI. The Applications track is open to the students who have introductory programming skills are interested to learn how to use the tools and algorithms of AI. Students in both tracks are expected to have completed a statistics course.

Students must ensure that they have the necessary prerequisites for the selected courses. Students cannot apply for both Minor in AI and the Certificate in AI.

Development Track (12 credits)

Required courses (6 credits)

- CAP 6635 Artificial Intelligence
- CAP 6673 Data Mining and Machine Learning

Elective Courses (6 credits)

- Select 2 courses from Table 1.

Applications Track (12 credits)

(not opened to graduate students in the CEECS department, except MSITM major)

Required courses (6 credits)

- CAP 5625 Computational Foundations of Artificial Intelligence
- CAP 6616 Applied Machine Learning

Elective Courses (6 credits)

- Select 2 courses from Table 1.

Table 1 (Electives)

Select two courses from the list below. Additional courses may be used as electives with prior approval of the advisor.

Vision	
Foundations of Vision	CAP 6411
Computer Vision	CAP 6415
Machine Learning for Computer Vision	CAP 6618
Visual Information Retrieval	COP 6728
Data Analytics and Algorithms	
Big Data Analytics with Hadoop	CAP 6780

Social Networks and Big Data Analytics	CAP 6315
Data Mining for Bioinformatics	CAP 6546
Design and Analysis for Engineering Data	CGN 5716
Introduction to Data Science	CAP 5768
Computer Performance Modeling	CEN 6405
Knowledge Management and Reasoning	
Information Retrieval	CAP 6776
Web Mining	CAP 6777
Natural Language Processing	CAP 6640
Semantic Web Programming	COP5859
Machine/Deep Learning	
Introduction to Neural Networks	CAP 5615
Evolutionary Computing	CAP 6512
Deep Learning	CAP 6619
Advanced Data Mining and Machine Learning	CAP 6778
Sparse Learning	CAP 6617
Reinforcement Learning	CAP 6547
Applications	
Robotic Applications	EEL 5661
Computational Advertising and Real-time Data Analytics	CAP 6807
Artificial Intelligence in Medicine and Healthcare	CAP 6683
Intelligent Transportation Systems	TTE 6272
Intelligent Underwater Vehicles 1	EOC 6663
Industrial Automation	EIN 5603C

From:Rainer Steinwandt <RSTEINWA@fau.edu>
Sent:Wednesday, October 7, 2020 9:44 PM
To:Mihaela Cardei <mcardei@fau.edu>
Cc:William Kalies <WKALIES@fau.edu>; Frederick Hoffman <HOFFMAN@fau.edu>; Hanqi Zhuang <zhuang@fau.edu>
Subject:RE: Curriculum items from CEECS

Hello,

Thanks. With this, there are no concerns from math for the proposed minors, certificate, and courses.

Best,
Rainer

From:Mihaela Cardei <mcardei@fau.edu>
Sent:Wednesday, October 7, 2020 9:17 PM
To:Rainer Steinwandt <RSTEINWA@fau.edu>
Cc:William Kalies <WKALIES@fau.edu>; Frederick Hoffman <HOFFMAN@fau.edu>; Hanqi Zhuang <zhuang@fau.edu>
Subject:Re: Curriculum items from CEECS

Hello Rainer,

Thank you for your reply. We met with the curriculum in AI group and we agreed to follow the guidelines from Dr Ivy (see the attached emails on June 19 and July 26) when proposing new courses in AI. These guidelines clarify that other units could develop courses in their specific areas. We agree that CAP 4612 will not be used to block mathematics/statistics courses in (applied) machine learning.

The course CAP6616 was originally proposed for the MSITM program and Big Data Analytics Certificate. These are joint programs with ITOM, and as part of the curriculum revisions we decided to add CAP 6616 and the Business course "ISM 6427: Business Innovation with Artificial Intelligence" to both programs. Many of the MSITM students do not have the background to take the existing course CAP 6673. The 6xxx versus 5xxx course level was discussed in the CEECS department and they decided to keep the 6xxx level, same as the Business course ISM 6427, since this will benefit MSITM students.

For your information, all these items CAP 6616, ISM 6427,MSITM, and the Big Data Certificate are on the UGC Consent/Action Agenda for the Senate meeting on October 12th. The proposed courses CAP 6616 and ISM 6427 are part of the program changes.

I hope my explanation addresses your concerns.

Best regards,
Mihaela

From:Rainer Steinwandt <RSTEINWA@fau.edu>
Sent:Wednesday, October 7, 2020 1:35 PM
To:Mihaela Cardei <mcardei@fau.edu>
Cc:William Kalies <WKALIES@fau.edu>; Frederick Hoffman <HOFFMAN@fau.edu>
Subject:RE: Curriculum items from CEECS

Dear Mihaela,

I hope all is well. From a conversation with Bill about a meeting of the AI curriculum group, I understand that your proposed minor and certificate will not prevent us from contributing to a university-wide minor in Applications of AI, where students are not required to take courses in other Colleges. With this understanding, I am happy to say that we have

- No concerns about the AI certificate, thanks for checking.
- No concerns about the AI minor, thanks for checking.

For the courses:

- Proposed CAP 2500: No concerns, thanks for checking.
- Proposed CAP 4612: Within the SUS, Applied Machine Learning is already taught under an STA prefix (see STA 4634/5635 at FSU), so we would seek confirmation that this course will not be used to block mathematics/statistics courses in (applied) machine learning. If CAP 4612 will not be used to block mathematics/statistics courses in (applied) machine learning, we have no concerns.
- Proposed CAP 6616: This course appears to overlap with the existing and fairly accessible CAP 5768 (taught by two departments), specifically on Machine Learning, Decision Trees, Bayes Learning. Is a new course really needed? The proposed course appears to use the very same book as the existing CAP 6673 and the proposed CAP 4612. In view of the light prerequisite, the 6000-level clarification appears problematic – for graduate students in math, we would not be comfortable accepting this as a 6000-level course.

Best,
Rainer

From:Mihaela Cardei <mcardei@fau.edu>
Sent:Tuesday, September 15, 2020 2:53 PM
To:Frederick Hoffman <HOFFMAN@fau.edu>; Rainer Steinwandt <RSTEINWA@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>; Jerome Haky <hakyj@fau.edu>; Kevin Wagner <kwagne15@fau.edu>; Dan Meeroff <dmeeroff@fau.edu>
Subject:Curriculum items from CEECS

Hello Dr. Hoffman and Dr. Steinwandt,

I am writing regarding the 6 CEECS items that have been discussed yesterday in the UUPC (first 4 items) and Senate meeting (last 2 items):

Certificate in AI
Minor in AI
CAP 2500 Applications of AI
CAP 4612 Applied Machine Learning and Data Mining
Graduate Minor in AI
CAP 6616 Applied Machine Learning

Please find attached the revised forms. As discussed in the meetings, the Department of Mathematical Sciences has been added to the list of departments consulted for these items.

Please let us know if you have any objections on these items.

Best regards,
Mihaela Cardei

From:Tamara Dinev <tdinev@fau.edu>
Sent:Monday, October 5, 2020 7:15 PM
To:Mihaela Cardei <mcardei@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>
Subject:RE: Curriculum items from CEECS

Dear Dr. Hanqi:

ITOM has no objections over your proposed curriculum items.

Best Regards:

Tamara

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Tamara Dinev, Ph.D., Department Chair and Professor
Dean's Distinguished Research Fellow
Department of Information Technology and Operations Management, FL 219
College of Business, Florida Atlantic University
Boca Raton, Florida 33431
tel. (561) 297-3181, email: tdinev@fau.edu
Google Scholar:<https://scholar.google.com/citations?user=YH8QZ-YAAAAJ&hl=en>

From:Tamara Dinev <tdinev@fau.edu>
Sent:Tuesday, September 15, 2020 9:21 PM
To:Mihaela Cardei <mcardei@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>
Subject:RE: Curriculum items from CEECS

Dear Dr. Cardei, Dr. Zhuang:

I will discuss your proposals with the ITOM faculty and get back to you

Best Regards:

Tamara

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Tamara Dinev, Ph.D., Department Chair and Professor
Dean's Distinguished Research Fellow
Department of Information Technology and Operations Management, FL 219
College of Business, Florida Atlantic University
Boca Raton, Florida 33431
tel. (561) 297-3181, email: tdinev@fau.edu
Google Scholar:<https://scholar.google.com/citations?user=YH8QZ-YAAAAJ&hl=en>

From:Mihaela Cardei <mcardei@fau.edu>
Sent:Tuesday, September 15, 2020 7:10 PM
To:Tamara Dinev <tdinev@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>
Subject:Curriculum items from CEECS

Hello Dr Dinev,

CEECS has the following items submitted for approval at the UUPC and Senate committee.

Certificate in AI

Minor in AI

CAP 2500 Applications of AI

CAP 4612 Applied Machine Learning and Data Mining

Graduate Minor in AI

Please let us know if you have any objections on these items.

thanks,
Mihaela

From:Mihaela Cardei <mcardei@fau.edu>
Sent:Thursday, September 17, 2020 2:18 PM
To:William Trapani <wtrapan1@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>; Kevin Wagner <kwagne15@fau.edu>; Michael Horswell <HORSWELL@fau.edu>; Stella Batalama <sbatalama@fau.edu>
Subject:Re: Curriculum items from CEECS

Hello Bill,

Thank you for your prompt reply and support of our proposals. We agree with the two items listed below.

Best regards,
Mihaela

From:William Trapani <wtrapan1@fau.edu>
Sent:Thursday, September 17, 2020 10:53 AM
To:Mihaela Cardei <mcardei@fau.edu>
Cc:Hanqi Zhuang <zhuang@fau.edu>; Kevin Wagner <kwagne15@fau.edu>; Michael Horswell <HORSWELL@fau.edu>
Subject:Re: Curriculum items from CEECS

Good morning Mihaela,

Arts and Letters has two concerns, neither of which can be addressed by the letter of the documents.

1. We would hope there would be a pathway for our courses to be considered and eventually listed in the minor, most likely under what you are calling the "Applications Track" electives. The Table does allow for additional electives per advisor permission so at a minimum we are seeking assurance that those permissions would not be overly restrictive and that our faculty's courses would find a home in the minor. Ideally there would be a commitment to list the courses so that we do not have to worry over individual instructor approval.

2. We are working on advancing our own profile in these areas and we will no doubt be seeking approval for minors and/or certificates of our own. Insofar as we follow Associate Provost Russ Ivy's guidance to Dean's in his June email that such degrees not claim the direct and simplified label "Artificial Intelligence" as their title and that they do not wholly duplicate courses you offer we would anticipate Engineering and Computer Science's support for our degrees/certificates.

We have no specific concerns with the content of the proposed course or of the proposed minor other than the two listed above so assuming we have an understanding on those points Arts and Letters is in support of your proposal(s).

Best,
Bill

William Trapani
Director, School of Interdisciplinary Studies
Dorothy F. Schmidt College of Arts and Letters
Florida Atlantic University

From: Mihaela Cardei <mcardei@fau.edu>
Sent: Tuesday, September 15, 2020 3:44 PM
To: William Trapani <wtrapan1@fau.edu>
Cc: Hanqi Zhuang <zhuang@fau.edu>; Kevin Wagner <kwagne15@fau.edu>
Subject: Curriculum items from CEECS

Hello Dr. Trapani,

I am following up regarding the 2 CEECS items discussed yesterday in the Senate meeting (attached):

CAP 6616 Applied Machine Learning
Graduate Minor in AI

We have revised the forms according to the meeting discussions.

Please let us know if you have any objections on these items.

Best regards,
Mihaela