NEW/CHANGE PROGRAM REQUEST
Graduate Programs

FAU
FLORIDA ATLANTIC UNIVERSITY

UGPC Approval _____
UFS Approval _____
Banner _____
Catalog _____

Department Electrical Engineering and Computer Science (EECS)

College Engineering and Computer Science

Program Name		Effective Date
Professional Artificial Intelligence Graduate Certificate	☐ New Program*	*(TERM & YEAR)*
	✔ Change Program*	Fall 2022

Please explain the requested change(s) and offer rationale below or on an attachment.

EECS department is proposing a self-supporting version of its existing program, the Professional Artificial Intelligence Graduate Certificate. This program is designed specifically for working professionals and will allow them to attain a certification in AI while continuing their professional career. The admission requirements and the curriculum specifications are detailed in the attached document.

*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.

Faculty Contact/Email/Phone	**Consult and list departments that may be affected by the change(s) and attach documentation**
Hanqi Zhuang / zhuang@fau.edu / 561-297-3413	

Approved by		**Date**
Department Chair	_(signature)_	9/22/2021
College Curriculum Chair	_(signature)_	09/22/2021
College Dean	M Carder _(signature)_	9/25/2021
UGPC Chair	Christopher Beetle _(signature)_	Oct 22, 2021
UGC Chair	PRB _Paul R. Peluso (Oct 22, 2021 15:47 EDT)_	Oct 22, 2021
Graduate College Dean	Robert W. Stackman _Robert W. Stackman (Oct 22, 2021 16:41 EDT)_	Oct 22, 2021
UFS President		
Provost		

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

Professional Artificial Intelligence Graduate Certificate

The Artificial Intelligence Graduate Certificate Professional Program is designed specifically for working professionals. Professionals will be able to advance their careers with an accelerated graduate program and obtain an advanced degree while continuing to work in their professional careers. The course offering format includes evenings, weekends and online material using Canvas. This degree requires 12 graduate credits. The duration of each course is four weeks or one of the FAU semester/mini-mester course duration. Students will be able to complete the program in one year or less.

Admission Requirements
To qualify for unconditional or full acceptance into the Graduate Certificate in Artificial Intelligence Professional Program, applicants are required to meet all the admission requirements for the Graduate Certificate in Artificial Intelligence program.

Conditional admission may be available under extraordinary circumstances for applicants who show high promise to successfully complete the program and who have received a bachelor's degree from a regionally accredited institution, but who fall short of the GPA and/or the GRE requirement. In these cases, the admissions committee will review the application carefully and consider all aspects including, but not limited to, grade trends, mature work experience, work accomplishment and promotion, type and rigor of the undergraduate degree program, references and letters of recommendation.

Degree Requirements
Degree requirements are the same as those of the Graduate Certificate in Artificial Intelligence program.

Program Fees
The Graduate Certificate in Artificial Intelligence Professional Program is a full-service, all-inclusive program. The fees cover all program costs including tuition, course materials and graduation activities.

Application Process and More Information
To apply or receive more information about this program, visit the Electrical Engineering and Computer Science website or call 561-297-3855.

FLORIDA ATLANTIC UNIVERSITY

Proposal for For-Credit Self-Supporting Program

This form must be completed and submitted to Continuing Education/Office of the Provost. New degrees, or an existing degree with a different curriculum tied to Self-Supporting delivery, must be approved through the normal faculty governance process.

College or Academic Unit: College of Engineering and Computer Science (COECS)

Department/School of Academic Unit: Department of Electrical Engineering and Computer Science (EECS)

Name of Degree: Artificial Intelligence Graduate Certificate

Specialized track (if applicable): Professional

CIP Code: NA

Proposed Implementation Date: Fall 2022

1. Describe the operation and delivery format of the program. Include information of the uniqueness of the program, the target audience, and enrollment projections. Please provide information on data for enrollment projection.

The Department of Electrical Engineering and Computer Science (EECS) in the College of Engineering and Computer Science (COECS) at FAU is proposing a Professional Artificial Intelligence (AI) Graduate Certificate.

The course offering format includes evenings, weekends, and online material. The Professional AI Graduate Certificate has 12 credits, and the curriculum structure is similar to the existing AI Graduate Certificate. Each course duration is 4 weeks. The expected completion time is 2 semesters. Students will participate in the program in cohort. Students will start the program at the beginning of Fall/Spring/ Summer semesters, or at the beginning of an 8-week mini-mester during the Fall/Spring semesters.

The targeted audience includes, but is not limited to, working professionals in South Florida. They will be able to gain knowledge and skills in the concepts, technologies and applications of artificial intelligence while continuing their professional careers. This certificate program should enroll approximately 10 students the first year with an ongoing enrollment of 20 students in year five and thereafter.

Enrollment Projections for the AI Graduate Certificate:

Year	Head Count	Credit Hours	FTE*
2022	10	120	3.75
2023	10	120	3.75
2024	12	144	4.5
2025	15	180	5.625
2026	20	240	7.5

Term Full-Time Equivalent enrollment (FTE) is based on FAU definition, which divides credit hours by 32: https://www.fau.edu/iea/pdf/sasva/Data_Dictionary_10-29-2019.pdf

2. State the tuition for the program and explain the process used to determine the proposed self-supporting tuition rate. Include information on similar programs being offered elsewhere and their self-supporting tuition rates. Attach market analysis for proposed program, include assessment of need and projected workforce demand.

The tuition for the proposed Artificial Intelligence Graduate Certificate is the same for in-state and out-of-state students. This tuition will be at the same as FAU's current tuition for approved self-supporting programs in offered in the College of Engineering and Computer Science. This tuition is set at $800 per credit. Students will complete the 12 credits certificate for a total tuition cost of $9,600.

3. Provide a listing of the curriculum for the present E&G program and the curriculum for the proposed self-supporting program. Is the curriculum for both programs the same?

The curriculum is the same as the E&G Curriculum and consist of 12 credits.

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

Development Track (12 credits)		
Required courses (6 credits)		
Artificial Intelligence	CAP 6635	3
Data Mining and Machine Learning	CAP 6673	3

Elective courses (6 credits). Select two courses from the Elective Table		
Applications Track (12 credits). _(Not open to graduate students in the Department of Electrical Engineering and Computer Science, except for students in the M.S. with Major in Information Technology and Management (MSITM))_		
Required courses (6 credits)		
Computational Foundations of Artificial Intelligence	CAP 5625	3
Applied Machine Learning	CAP 6610	3
Elective courses (6 credits). Select two courses from the Elective Table		

Elective Table

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

Introduction to Neural Networks	CAP 5615	3
Introduction to Data Science	CAP 5768	3
Data Mining for Bioinformatics	CAP 6546	3
Sparse Learning	CAP 6617	3
Machine Learning for Computer Vision	CAP 6618	3
Deep Learning	CAP 6619	3
Natural Language Processing	CAP 6640	
Reinforcement Learning	CAP 6629	3
Artificial Intelligence in Medicine and Healthcare	CAP 6683	3
Advanced Data Mining and Machine Learning	CAP 6778	3
Computer Performance Modeling	CEN 6405	3
Robotic Applications	EEL 5661	3
Industrial Automation	EIN 5603C	3
Intelligent Underwater Vehicles	EOC 6663	3
Design and Analysis for Engineering Data	CGN 5716	3
Intelligent Transportation Systems	TTE 6272	3

4. Discuss the impact of the program on existing FAU programs.

   a. **Explain how the unit will ensure that sufficient courses, paid through auxiliary funds are available to meet student demand and facilitate completion of each program submitted for consideration.**
   The professional Artificial Intelligence Graduate Certificate contains courses that are already offered in FAU's approved self-supporting programs in the College of Engineering and Computer Science. These programs are managed in a cohort format, which will ensure that a sufficient number of courses are prescheduled and available to meet student demand and facilitate completion of students enrolling in the Artificial Intelligence Graduate Certificate. The schedules of the courses in this certificate will be pre-set.

   b. **Will any similar E&G courses be eliminated or scaled back if this program is implemented.**
   The current Artificial Intelligence Graduate Certificate will not be eliminated or scaled back. The program offerings will run side-by-side.

5. Will this program increase the state's fiscal liability or obligation? Will the self-supporting program cohort supplant or diminishing productivity of an existing E&G funded degree program in the same discipline?
This self-supporting program will not increase the state's fiscal liability or obligation. The Self-supporting program track cohort should not supplant or diminish the productivity an existing E&G funded degree program in the same discipline.

6. How will offering the proposed Self-Supporting program aligns with the mission of FAU (Race to Excellence 2015-2025). Outline how this program assists the University in achieving its performance metrics. Include information on assessment of need and projected workforce demand.

The professional Artificial Intelligence Graduate Certificate aligns with the University's mission of pursuing excellence in teaching and actively engaging with the community. The program will assist the university in increasing graduates in areas of strategic emphasis and expand graduate enrollment. The proposed program is aligned with the strategic plan of the University to grow research activities and education in engineering, artificial intelligence and data analytics. The self-supporting tuition programs also contributes to the University's strategic goal of enriching the educational experience by strengthening and expanding graduate programs at FAU, as well as meeting professional and workforce needs.

Over the past years, there has been dramatic progress in the rise of artificial intelligence (AI) and its use in the development of systems that can reason and respond to increasingly complex situations. To become competitive, companies and corporations will have to embrace AI to some extent. These technological innovations are made possible by engineers, scientists, and other professionals with knowledge and expertise in the latest advancements in the field of AI.

Workforce Demand:

The demand for university graduates level skills in artificial intelligence is strong. Over the past years, there has been dramatic progress in the rise of artificial intelligence (AI) and its use in the development of systems that can reason and respond to increasingly complex situations. AI is everywhere and the changes enabled by this technology have just begun. AI is transforming every segment of American industry. It is making agriculture more precise and efficient, revealing new medical technologies and bringing the prospect of autonomous transportation and advanced manufacturing closer to reality. The AI Graduate Certificate is designed to allow working professionals in the region to continue working full-time while they pursue their degree. We expect the certificate to be popular among our corporate educational partner JM Family Enterprises. JM Family Enterprises has enrolled 48 students Graduate Certificate in Big Data Analytics Certificate since the inception of the corporate educational partnership in Fall 2019. AI will provide an additional avenue for training its employees.
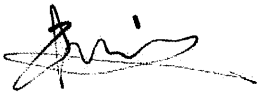
7. Identify any prerequisites or restrictions for acceptance into this program.

This certificate program is open to students with a bachelor's degree in any academic area and who are not majoring in Artificial Intelligence. Students are expected to have completed a statistics course before stating the certificate courses. Students must satisfy the prerequisites for each course in the program. The average GPA of all four courses counted in the program must be 3.0 or better. This certificate requires four courses that have not been counted in any other minor or certificate program within the College of Engineering and Computer Science.

8. How will the unit monitor the quality and success of the self-supporting program? Provide specific metrics, evaluation methods, and frequency of evaluation.

- Number of students enrolled: The number of students enrolled in each semester will vary. Students can start the program at the beginning of Fall/Spring/ Summer semesters, or at the beginning of an 8-week mini-mester during the Fall/Spring semesters. Enrollment is a function of market demand and economic conditions, as well as a prospective student's self-assessment of their time and availability to commit to a program.

- Number of students graduating: The program structure reinforces timely graduation rates. The number of students for each program during each calendar year will be evaluated.
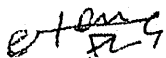
- Student satisfaction: A satisfaction score will be reported for each course. The score will measure a composite of items including program content, pedagogical effectiveness of the professor, and administrative services provided to the student.

9/21/2021

Department Chair/School Director   Date

09/22/2021

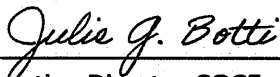**College Curriculum Committee**   Date

Digitally signed by Mihaela Cardei
DN: cn=Mihaela Cardei, o=Florida
Atlantic University, ou,
email=mcardei@fau.edu, c=US
Date: 2021.09.22 12:14:13 -04'00'

9/22/2021
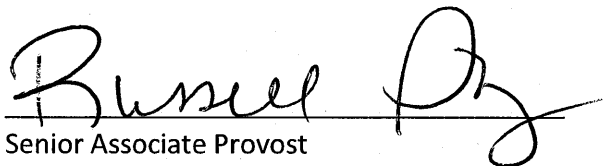
Dean College of Engineering and Computer Science   Date

9/30/2021

Executive Director COCE   Date

10/4/21

Senior Associate Provost   Date

University Curriculum Committee   Date

University Faculty Senate   Date

Chief Financial Officer   Date

_____   _____

Provost or Designee   Date

College of Engineering and Computer Science - Professional Certificate in Artificial Intelligence

Year 1		10 Students
Total Course Revenues ($800 per credit for 12 credits per student)	$	96,000
Total Revenue and Local Fees[1]	$	(8,173)
COECS Course Revenues	$	**87,827**
Total Direct Expenses[2]	$	(47,700)
Total Indirect Expenses[3]	$	(15,050)
Total Auxiliary Overhead Fee and Provost Fee from Program[4]	$	(8,904)
Program Result - Year 1	$	**16,173**

Year 2		10 Students
Total Course Revenues ($800 per credit for 12 credits per student)	$	96,000
Total Revenue and Local Fees[1]	$	(8,173)
COECS Course Revenues	$	**87,827**
Total Direct Expenses[2]	$	(47,700)
Total Indirect Expenses[3]	$	(15,050)
Total Auxiliary Overhead Fee and Provost Fee from Program[4]	$	(8,904)
Program Result - Year 2	$	**16,173**

Year 3		12 Students
Total Course Revenues ($800 per credit for 12 credits per student)	$	115,200
Total Revenue and Local Fees[1]	$	(9,808)
COECS Course Revenues	$	**105,392**
Total Direct Expenses[2]	$	(49,500)
Total Indirect Expenses[3]	$	(15,050)
Total Auxiliary Overhead Fee and Provost Fee from Program[4]	$	(9,160)
Program Result - Year 3	$	**31,682**

COECS Program Result - First 3 Years	$	**64,028**
FAU 3 Year Revenue from Rev Fees/Local Fees/Aux. Overhead/Provost Fee	$	**53,122**
Yearly Program Result Year 4 and thereafter	$	**47,027**

We expect the College of Engineering and Computer Science to spend 80% of the yearly cash balance adding additional overhead revenues to the University.

Budget Details:

[1]Revenue and Local Fees:
  - Local fees per credit for athletics ($19.27), financial aid ($15.18), activity & service ($12.32), health ($9.42), capital improvement ($6.76), technology ($5.16)
  - Gross revenue fee at 0% for the first three years, then 5.5% from year 4

[2]Direct Expenses:
  - Faculty salary at $9,000 per class plus FICA
  - Meals expense at $40 per day on weekends per student
  - Books, materials and parking estimated at $145.00 per student per class

[3]Indirect Expenses:
  - Coordinator at $10,050 per year for admissions, registration, and student services (total S&B is $60,300 to be split across several programs)
  - Recruiting and marketing expense at $5,000 per year for flyers, online advertisements, etc.

[4]Aux Overhead and Provost Fees:
  - Provost fee at 3% of expenditures
  - Auxiliary overhead fee at 11.19% of expenditures