

NOTICE OF INTENT

Form No. BAAC-01

Section 1007.33(5)(d), Florida Statutes (F.S.), and Rule 6A-14.095, Florida Administrative Code (F.A.C.), outline the requirements for Florida College System baccalaureate program proposals. The completed Notice of Intent form, incorporated in Rule 6A-14.095, F.A.C., Site Determined Baccalaureate Access, shall be submitted by the college president to the chancellor of the Florida College System at ChancellorFCS@fldoe.org.

CHECKLIST

The notice of intent requires completion of the following components:

- Program summary
- Program description
- Workforce demand, supply, and unmet need
- Planning process

FLORIDA COLLEGE SYSTEM INSTITUTION INFORMATION

Institution Name:	Miami Dade College (MDC)
Institution President:	Madeline Pumariega

PROGRAM SUMMARY

1.1	Program name.	Applied Artificial Intelligence
1.2	Degree type.	<input checked="" type="checkbox"/> Bachelor of Science <input type="checkbox"/> Bachelor of Applied Science
1.3	How will the proposed degree program be delivered? (check all that apply).	<input checked="" type="checkbox"/> Face-to-face (F2F) (Entire degree program delivered via F2F courses only) <input type="checkbox"/> Completely online (Entire degree program delivered via online courses only) <input checked="" type="checkbox"/> Combination of face-to-face/online (Entire degree program delivered via a combination of F2F and online courses)
1.4	Degree Classification of Instructional Program (CIP) code (6-Digit).	11.0102 - Artificial Intelligence
1.5	Anticipated program implementation date.	08/01/2023
1.6	What are the primary pathways for admission to the program? Check all that apply.	<input checked="" type="checkbox"/> Associate in Arts (AA) <input checked="" type="checkbox"/> Associate in Science (AS) <input type="checkbox"/> Associate in Applied Science (AAS) If you selected AS/AAS, please specify the program: Associate in Science (AS) in Applied Artificial Intelligence (<i>In Parallel Development</i>)
1.7	Is the degree program a STEM focus area?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.8	List program concentration(s) or track(s) (if applicable).	Not applicable

PROGRAM DESCRIPTION

2.1 This section is the **executive summary** of this notice of intent. We recommend providing an abbreviated program description including but not limited to: the program demand, current supply, and unmet need in the college's service district; primary pathways to program admission; overview of program curriculum; career path and potential employment opportunities; and average starting salary. We encourage approximately 300 words for a sufficient description.

The Bachelor of Science (BS) degree in Applied Artificial Intelligence is designed to meet the demand for artificial intelligence (AI) professionals and will support the prosperity and growth of businesses in Florida. Through a comprehensive curriculum, students in this program will acquire the knowledge and skills needed for the practical applications of AI. They will learn about ethical standards and socially responsible practices in the implementation of AI systems and data-driven decision making. Course work includes Computer Vision, Natural Language Processing, Machine Learning, Applied Optimization Theory and Decision Making, AI Automation, Applied Simulation, Data Structures, and AI Capstone.

Teaching and hands-on learning will be enhanced by the facilities, equipment, and artificial intelligence technologies offered at the MDC state-of-the-art AI Center while students pursue a structured and continued academic pathway. This program is suited for Associate in Arts (AA) or Associate in Science (AS) students who meet the admission requirements and are interested in gaining a BS degree in Artificial Intelligence. Graduates of this baccalaureate degree will be prepared for immediate entry into the workforce as AI Analysts, Natural Language Processing Specialists, Computer Vision Analysts, Machine Learning Specialists, and AI Programmers. The curriculum also prepares students to continue their education towards an advanced AI degree.

The Florida Department of Economic Opportunity (DEO) reports a much faster than average job growth increase (23.2%) for the combined SOC codes of 15-1245 (Database Administrators and Architects), 15-1251 (Computer Programmers), 15-1256 (Software Developers and Software Quality Assurance Analysts and Testers), 15-1299 (Computer Occupations, all other), and 15-2098 (Data Scientists and Mathematical Science Occupations, All Other). There are a total of 1,033 annual job openings projected for these occupations in Workforce Development Area 23, with an average hourly wage of \$45.58 and an average annual salary of \$94,815¹. Currently, none of the institutions in Miami Dade College's local service area offer CIP 11.0102 – Artificial Intelligence, allowing the proposed program to fulfill the workforce demand of these occupations.

WORKFORCE DEMAND, SUPPLY, AND UNMET NEED

¹ *Employment Projections*. (n.d.). Florida Department of Economic Opportunity. Retrieved September 26, 2022, from <https://www.floridajobs.org/workforce-statistics/data-center/statistical-programs/employment-projections>

3.1 Describe the workforce demand, supply, and unmet need for graduates of the program that incorporates, at a minimum, the shaded information from Sections 3.1.1 to 3.1.4. For proposed programs without a listed Standard Occupational Classification (SOC) linkage, provide a rationale for the identified SOC code(s). If using a SOC that is not on the CIP to SOC crosswalk, please justify why the SOC aligns with the baccalaureate program.

Applied artificial intelligence is a new and emerging field where jobs with new titles, such as Artificial Intelligence Analysts or Artificial Intelligence Programmers continue to emerge as the applications of AI evolves. Employability of graduates in this developing field is tethered to the depth of their skills and knowledge of AI tools and technologies, and the hands-on experience this program offers. The conducted crosswalk² for the new CIP 11.0102 (Artificial Intelligence) generated SOC codes 15-2051 (Data Scientists) and 15-1252 (Software Developers), which reflects the occupations graduates of this program will be prepared to fill. These are not yet used by the Florida Department of Economic Opportunity, thus 15-1256 (Software Developers and Software Quality Assurance Analysts and Testers) and 15-2098 (Data Scientists and Mathematical Science Occupations, All Other) offers the closest match. Further analysis also generated 15-1251 (Computer Programmers), 15-1245 (Database Administrators and Architects), and 15-1299 (Computer Occupations, all other) as occupations that closely aligns with the emerging profession and on which MDC completed its workforce demand.

A compilation from the Florida Department of Economic Opportunity (DEO) (*Table 3.1.1*) and Lightcast™ labor market analytics (*Table 3.1.2*) demonstrate the aforementioned occupations have a much faster than average job outlook (2021-2029) with DEO projecting a combined growth of 23.2% and Lightcast projecting growth at 21.8%³. There are a total of 1,033 annual job openings projected by the DEO with an average hourly wage of \$45.58 and an average annual salary of \$94,815 in Workforce Development Area 23. Currently, none of the institutions in Miami Dade College's local service area that offer CIP 11.0102 – Artificial Intelligence. Given that no graduates have been produced, the unmet need is projected at 1,033.

² *The Classification of Instruction Programs – CIP2020/SOC2018 Crosswalk* (n.d.). National Center for Education Statistics. Retrieved September 26, 2022, from <https://nces.ed.gov/ipeds/cipcode/default.aspx?y=56>.

³ Lightcast. (n.d.). Retrieved September 26, 2022, from <https://a.economicmodeling.com/analyst>

DEMAND: FLORIDA DEPARTMENT OF ECONOMIC OPPORTUNITY (DEO) EMPLOYMENT PROJECTIONS

3.1.1 The Excel spreadsheet below is set up with predefined formulas. To activate the spreadsheet, right click within the spreadsheet, go to “Worksheet Object”, and then “Open”. To exit, save any changes and exit out of the spreadsheet. Alternatively, double click anywhere on the table. To exit the spreadsheet, single click anywhere outside of the table.

CLICK [HERE](#) FOR INSTRUCTIONS FOR COMPLETING THE DEMAND SECTION

Occupation			Number of Jobs				Salary		Education Level	
Name/Title	SOC Code	County/Region	2021	2029	**Level Change	***Total Job Openings	Average Hourly Wage	Annualized Salary	FL	BLS
Database Administrators and Architects	15-1245	Region 23	910	1,073	17.91	655	\$ 46.29	\$ 96,283	A	B
Computer Programmers	15-1251	Region 23	1,378	1,545	12.12	879	\$ 39.50	\$ 82,160	PS	B
Software Developers and Software Quality Assurance Analysts and Testers	15-1256	Region 23	5,894	7,977	35.34	5,486	\$ 42.61	\$ 88,629	B	B
Computer Occupations, all other	15-1299	Region 23	1,639	1,863	13.67	1,165	\$ 42.61	\$ 88,629	PS	B
Data Scientists and Mathematical Science Occupations, All Other	15-2098	Region 23	81	111	37.04	82	\$ 56.91	\$ 118,373	B	B
								\$ -		
								\$ -		
								\$ -		
								\$ -		
								\$ -		
								\$ -		
						Total		\$ 45.58	\$ 94,815	

*Please replace the “Base Year” and “Projected Year” headers with the years reflected in the projections portal (e.g., Base Year is 2019, Projected Year is 2027).

**Please note that the “Level Change” column in Table 3.1.1 corresponds to the “Percent Growth” employment projections data produced by the DEO.

***Please note that the “Total Job Openings” columns is preset to be divided by 8.

DEMAND: OTHER ENTITY INDEPENDENT OF THE COLLEGE – Lightcast™

3.1.2 The Excel spreadsheet below is set up with predefined formulas. To activate the spreadsheet, right click within the spreadsheet, go to “Worksheet Object”, and then “Open”. To exit, save any changes and exit out of the spreadsheet. Alternatively, double click anywhere on the table. To exit the spreadsheet, single click anywhere outside of the table.

Occupation			Number of Jobs				Salary		Education Level	
Name/Title	SOC Code	County/Region	2021	2029	Level Change	Total Job Openings	Average Hourly Wage	Annualized Salary	FL	BLS
Database Administrators	† 15-1242	Region 23	515	573	11.26	376	\$ 46.81	\$ 97,365	B	B
Database Architects	† 15-1243	Region 23	293	336	14.68	224	\$ 59.72	\$ 124,218	B	B
Computer Programmers	15-1251	Region 23	896	895	-0.11	496	\$ 47.50	\$ 98,800	B	B
Software Developers	† 15-1252	Region 23	6,093	7,723	26.75	5,616	\$ 48.18	\$ 100,214	B	B
Computer Occupations, all Other	15-1299	Region 23	537	690	28.49	496	\$ 37.74	\$ 78,499	B	B
Data Scientists	† 15-2051	Region 23	1,442	1,690	17.20	1,152	\$ 31.37	\$ 65,250	B	B
								\$ -		
								\$ -		
								\$ -		
								\$ -		
								\$ -		
						Total	1045	\$ 45.22	\$ 94,058	

*Please replace the “Base Year” and “Projected Year” headers with the corresponding years reported.

† Based on the National Center for Education Statistics (NCES) CIP 2020 to SOC 2018 crosswalk, the correct SOC codes for CIP 11.0102 Artificial Intelligence are 15-1252 for Software Developers and 15-2051 for Data Scientists. Similarly, the updated SOC codes for Database Architects and Database Administrators are 15-1243 and 15-1242, respectively. Data from Lightcast is available using the updated SOC codes.

ESTIMATES OF UNMET NEED

3.1.4 The Excel spreadsheet below is set up with predefined formulas. To activate the spreadsheet, right click within the spreadsheet, go to “Worksheet Object”, and then “Open”. To exit, save any changes and exit out of the spreadsheet. Alternatively, double click anywhere on the table. To exit the spreadsheet, single click anywhere outside of the table.

CLICK [HERE](#) FOR INSTRUCTIONS FOR COMPLETING THE ESTIMATES OF UNMET NEED SECTION: If institutions do not have data available for completers in the service district, please report statewide data. You may note these are statewide figures.

	Demand	Supply		Range of Estimated Unmet Need							
	(A)	(B)	(C)	(A-B)	(A-C)						
	Total Job Openings	Most Recent Year	5-year average or average of years available if less than 5 years	Difference	Difference						
DEO	1,033	0	0	1033	1033						
Lightcast	1,045	0	0	1045	1045						

3.2 Describe any other evidence of workforce demand and unmet need for graduates as selected by the institution, which may include qualitative or quantitative data and information not reflected in the data presented in Sections 3.1.1 to 3.1.4, such as local economic development initiatives, emerging industries in the area, or evidence of rapid growth.

Artificial intelligence (AI) has grown at impressive rates in recent years with many experts predicting it to contribute to the fourth industrial revolution affecting all industries and society at large⁴. From healthcare to banking, AI solutions are already transforming many facets of these industries with its capabilities to increase productivity and operational efficiencies. Reflecting the need of virtually all businesses to maintain a competitive edge, Gartner reports a 270% growth in use of AI technologies just in the past four years⁵. As AI technologies proliferate, so will the need for institutions of higher learning to create a robust AI workforce that supports local industries. The proposed BS in Applied AI is poised to contribute to an AI-enabled workforce that can contribute to the effective use of predictive analytics, leveraging smart chatbots and the implementation of AI tools for automation, to name a few. The program was designed in close collaboration with an Artificial Intelligence Team of business representatives who have prescribed the knowledge and skills they expect “right-skilled” graduates to possess 24-48 months into the future.

According to LinkedIn’s 2021 Jobs on the Rise U.S. Report, one job category that continued to flourish in spite of the often-devastating impact the Covid-19 pandemic had on the economy was artificial intelligence practitioners, listing it as the top emerging job trend in its report⁶. This is representative of the job growth in the South Florida region (Miami-Dade, Broward, and Palm Beach Counties) with a Lightcast analysis conducted for job openings in calendar 2021 through 8 months of 2022 using “artificial intelligence” in the job titles. 100 positions were posted with varying titles, such as Artificial Intelligence Analysts, Artificial Intelligence Programmers, and Artificial Intelligence Engineers. Companies represented by the job postings included but were not limited to Deloitte, Baptist Health, Accenture, Booz Allen Hamilton, and Anthem Blue Cross. It is noteworthy to mention that few AI positions have AI in the title, many still use the traditional Software Engineers, Data Scientist/Analysts, Programmers or Database Architects/Administrators.

⁴ Oosthuizen, R. (n.d.). The Fourth Industrial Revolution – Smart Technology, Artificial Intelligence, Robotics and Algorithms: Industrial Psychologists in Future Workplaces. National Institute of Health. Retrieved September 28, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9301265/>.

⁵ Partida, D. (2021, April 21). The Top 6 Ways AI Is Improving Business Productivity. Techopedia. Retrieved September 30, 2022, from <https://www.techopedia.com/the-top-6-ways-ai-is-improving-business-productivity-in-2021/2/34505>

⁶ Jobs on the Rise Report, United States. LinkedIn Talent Solutions. (2021). Retrieved September 27, 2022, from <https://business.linkedin.com/talent-solutions/resources/talent-acquisition/jobs-on-the-rise-us>

3.3 If the education level for the occupation identified by the Florida Department of Economic Opportunity (DEO) or the Bureau of Labor Statistics (BLS) presented in Sections 3.1.1 to 3.1.2 is below or above the level of a baccalaureate degree, provide justification for the inclusion of that occupation in the analysis.

Both the Florida Department of Economic Opportunity (DEO) and the Bureau of Labor Statistics (BLS) identifies the baccalaureate as the level of education for SOC codes 15-1256 (Software Developers and Software Quality Assurance Analysts and Testers) and 15-2098 (Data Scientists and Mathematical Science Occupations, All Other). Although the DEO specifies an Associate degree as the educational requirement for 15-1245 (Database Administrators and Architects), and post-secondary for 15-1251 (Computer Programmers) and 15-1299 (Computer Occupations, all other), the U.S. Bureau of Labor Statistics (BLS) indicates that a bachelor's degree is the entry-level education required. This requirement was further validated by the Lightcast workforce analysis on table 3.1.2, where all aforementioned SOC codes require a Bachelor's degree.

3.4 Describe the career path and potential employment opportunities for graduates of the program.

Students enrolled in the Associate in Science (AS) in Applied Artificial Intelligence will have a structured and continued academic pathway leading to the BS in Applied Artificial Intelligence. The program is also suited for Associate in Arts (AA) or other Associate in Science (AS) students who meet the admission requirements and are interested pursuing a baccalaureate in Applied Artificial Intelligence. Graduates of this program will be prepared for immediate entry into the workforce as AI Analysts, Natural Language Processing Specialists, Computer Vision Analysts, Machine Learning Specialists, AI Programmers, and other related positions that are expected to continue to emerge. The BS in Applied AI was also designed to prepare students for graduate level work in Artificial Intelligence.

PLANNING PROCESS

4.1 Summarize the internal planning process. In timeline format, please describe the steps your institution took in completing the internal review and approval of the baccalaureate program. For example, summarize actions taken by the academic department proposing the degree, any non-academic departments, the college-wide curriculum committee, the college president, the Board of Trustees and any other areas.

Fall 2021

- Developed and piloted AI Thinking course with an enrollment of 30 students.
- Awarded NSF grant AI for All to start the development of undergraduate programs in AI at Miami Dade College.

Spring 2022

- The Artificial Intelligence Discipline Committee was formed and begun meeting regularly to discuss plans towards the creation of a baccalaureate degree in Applied AI.
- AI Discipline Committee identified workforce demand and a pathway to careers in applied artificial intelligence.
- Faculty utilized knowledge, skills, and abilities evaluated and prioritized by the Artificial Intelligence Discipline Committee to develop curriculum.
- Lower division coursework that feeds the baccalaureate was drafted.
- Hosted professional development workshop—Leveraging Artificial Intelligence to Advance Student Success—for 300 MDC faculty to raise AI awareness and interest.

Summer 2022

- AI Discipline Committee met regularly to continue discussion and work towards the creation of a baccalaureate degree in Applied AI.
- AI Discipline Committee met with Aaron Burciaga, Chair of Global Analytics Certification Board, Senior Practice Manager, US Federal Partner Professional Services at Amazon Web Services (AWS) to review the knowledge, skills, and abilities all graduates must contain upon successful completion of the baccalaureate degree in Applied AI.
- AI Discipline Committee met to prioritize course offerings and identify sequencing for the baccalaureate degree in Applied AI courses.
- AI Discipline Committee met to identify the required math courses for the baccalaureate degree in Applied AI.
- AI Discipline Committee met to review upper division courses and ensure competencies/learning outcomes are mapped to prioritized applied AI knowledge, skills and abilities.
- AI Discipline Committee met to finalize the pathway and lower division course work that leads to the baccalaureate in Applied AI.

Fall 2022

- AI Discipline Committee met regularly to review and discuss Applied AI baccalaureate degree curriculum.
- AI Discipline Committee met with Prof. Habib Matar from Chandler Gilbert Community College to review and discuss proposed AI curriculum.
- AI Discipline Committee met to finalize draft curriculum in preparation for a meeting with the AI Advisory Committee.
- Submitted Notice of Intent through the Curriculum Approval Process.

4.2 Summarize the external planning process with the business and industry community. In timeline format, please describe your institution's interactions and engagements with external stakeholders, including but not limited to industry advisory boards meetings, discussions with advisory committees, briefings from local businesses, consultations with employers, and conducting paper and online surveys.

Fall 2021

- Miami Dade College partnered with AI4All to introduce and prepare students for careers in the burgeoning AI industry. The program connects participants with an approachable introduction to AI, internships, career-readiness resources, and a supportive on-campus peer community.

Spring 2022

- Miami Dade College received \$15M from James L. Knight Foundation, Miami-Dade County, City of Miami and Miami Downtown Development Authority to expand technology programs, including a baccalaureate in Applied AI.
- The Artificial Intelligence Advisory Committee was created to assist with the development of applied AI curriculum. This committee is comprised of renowned industry professionals from companies such as IBM, Intel, AWS, and McDonalds. These leaders follow the Business Industry Leadership Team (BILT) model, which consists of engaging industry as equal partners in curriculum development, student support, and workforce development.
- AI Advisory Committee first meeting launched with a Kick-Off, where valuable insights were shared about the knowledge, skills, and abilities (KSA) required by employers from graduates of an applied AI industry baccalaureate.
- KSAs were solidified and prioritized via vote by the Artificial Intelligence Advisory Committee.
- Partnered with Intel to implement the Intel® AI for Workforce Program. This program is aimed at educating the next generation of technologists, engineers and inventors in artificial intelligence, and help them launch successful careers in their chosen fields.

Summer 2022

- Survey sent to Artificial Intelligence Advisory Committee members to obtain feedback regarding the required math competencies in support of the Applied AI baccalaureate degree.

Fall 2022

- Opening of AI Center at Miami Dade College North Campus. The purpose of the AI Center is to serve as a hub for AI innovation in the county and beyond.
- Held an AI Advisory Committee Meeting to obtain feedback and share MDC's progress toward the development of a baccalaureate in Applied AI.
- APPRiSe Notification submitted.
- September 30, 2022 – Received Letter of Support from Industry Partner Roy E. Lowrance, CEO & Founder of Applied Data Science LLC.

- October 05, 2022 – Received Letter of Support from Industry Partner Aaron D. Burciaga, Chairman, DataPrime.

<p>4.3 List external engagement activities with public and nonpublic postsecondary institutions. This list shall include meetings and other forms of communication among external postsecondary institutions regarding evidence of need, demand, and economic impact.</p>
<p>4.3.1 Public Universities in College's Service District</p>
<p>Date(s): September 30, 2022</p> <p>Institution(s): Florida International University (FIU)</p> <p>Activity Descriptions and Outcomes: Miami Dade College (MDC) President Madeline Pumariega received a Letter of Support from FIU Interim Provost, Executive Vice President, and Chief Operating Officer, Dr. Elizabeth M. Bejar in support of the BS in Applied Artificial Intelligence.</p>
<p>Date(s): September 30, 2022</p> <p>Institution(s): Florida International University (FIU)</p> <p>Activity Descriptions and Outcomes: Manuel Perez, Dean for the School of Engineering, Technology and Design at MDC contacted the Deans of the Colleges of Arts and Sciences, Engineering and Computing, and Health Sciences and Technology to notify them of MDC's intent to submit a proposal for an Applied Artificial Intelligence baccalaureate degree.</p>
<p>4.3.2 Regionally Accredited Institutions in College's Service District</p>
<p>Date(s): September 30, 2022</p> <p>Institution(s): Florida Atlantic University (FAU)</p> <p>Activity Descriptions and Outcomes: Miami Dade College (MDC) President Madeline Pumariega received a Letter of Support from FAU Associate Dean for Graduate Studies and Professor, Dr. Mihael Cardei in support of the BS in Applied Artificial Intelligence.</p>
<p>Date(s): April 2022</p> <p>Institution(s): Palm Beach State College (PBSC)</p> <p>Activity Descriptions and Outcomes: MDC's School of Engineering and Technology Leadership Team met Department Chair of Accounting, Business, Office Administration and Computer Science Cluster Co-Chair to exchange resources and inform of MDC's intention to develop an Associate in Science Applied Artificial Intelligence framework to the Florida Department of Education.</p>
<p>4.3.3 Institutions outside of College's Service District (If applicable)</p>
<p>Date(s): September 2021</p> <p>Institution(s): University of Florida (UF)</p>

Activity Descriptions and Outcomes:

Professor Diego Alvarado from University of Florida met with MDC faculty to discuss the need for AI curriculum and University of Florida's approach to create an interdisciplinary AI curriculum to address the demand to better prepare its students. Professor Alvarado shared competencies for two courses: Fundamentals of AI, and AI Ethics.

Date(s): October 05, 2022

Institution(s): University of Florida (UF)

Activity Descriptions and Outcomes:

Miami Dade College (MDC) President Madeline Pumariega received a Letter of Support from UF Dean for UF Herbert Wertheim College of Engineering, Cammy R. Abernathy in support of the BS in Applied Artificial Intelligence.

Date(s): September 30, 2022

Institution(s): Barry University, University of Miami, St. Thomas University

Activity Descriptions and Outcomes:

Manuel Perez, Dean for the School of Engineering, Technology and Design at MDC contacted the Deans of the Colleges of Arts and Sciences, Engineering and Computing, and Health Sciences and Technology to notify them of MDC's intent to submit a proposal for an Applied Artificial Intelligence baccalaureate degree.