

### **PCAF: Artificial Intelligence (B.S.)**

The proposed B.S. in Artificial Intelligence heavily leverages existing ISI and Data Analytics (STQM) courses, [and will require] approximately 8 new courses in Artificial Intelligence.” “[The] degree will be more data science focused and will lightly utilize COB core courses. The target date for implementation is Fall 2020.

I support the proposed B.S. in Artificial Intelligence for the following reasons:

- Outstanding potential to attract students to Ferris. “Artificial Intelligence is one of the fastest growing fields in the world. AI investment in the US is projected to grow from \$8 billion in 2016 to \$47 billion in 2020.” “Berkley created a new Data Sciences Division due to soaring student interest (Chronicle, November 2018). Student enrollment grew from 100 students in 2015 to 1,300 in 2018.”
- Data Science/Artificial Intelligence is significantly underserved in Michigan.
- Outstanding job prospects for graduates. “Data scientist jobs are expected to grow by 40% ... [each] year through 2020. Glassdoor (2019) has identified Data Science as the “highest starting salary career.”

I approve the PCAF giving permission for the faculty to develop the full proposal with the understanding that, over this next budget year (2019-20), the proposers work with the account clerk in the College of Business, Dean Nicol, Kim Wilber and myself to build the projected start-up costs of \$46,500 into the College of Business budget for 2020-21. Then, continue to plan for and build the additional projected costs for Year 2 (\$148,600) and Year 3 (\$309,200) into subsequent College of Business budgets without going into deficit.

 8/20/19

**Directions:** This form should be completed using 11-point font or larger, and should be no longer than six pages (excluding the signature/comment pages and references). For purposes of expediting the preliminary approval process, forms may be forwarded electronically by the initiator and from one administrative level to another.

Name(s) of proposal initiator(s): Greg Gogolin, Ph.D., CISSP, PMP
Department(s)/College(s): ISI, Data Analytics/COB

Type of curriculum change (check one):

<input checked="" type="checkbox"/> New degree
<input type="checkbox"/> New minor requiring new courses/resources
<input type="checkbox"/> New Concentration in existing degree/program
<input type="checkbox"/> Curricular customization of existing program for off-campus cohort group
<input type="checkbox"/> New certificate requiring 3 or more new courses and/or new resources
<input type="checkbox"/> Existing program redirection or shift in emphasis if 3 or more new courses and/or new

1. **Name of degree, major, concentration, certificate, or minor. Briefly describe the curriculum plan/template.** B.S Artificial Intelligence. Initial design heavily leverages existing ISI and Data Analytics (STQM) courses, as well as approximately 8 new courses in Artificial Intelligence. Degree will be more data science focused and will lightly utilize COB core courses. Psychology, Sociology, Ethics and Marketing are relevant in this proposal. List of proposed courses:

DRAFT - V 1.0

Core Computer Courses

	credits
CLOU 131 Cloud Computing Fundamentals	3
CLOU 280 Current Topics in Cloud and Cyber	3
ISIN 300 Link and Visual Analysis	3
ISIN 301 Competitive Theory	3
ISIN 306 Security Informatics (Python)	3
ISIN 325 Database	3
*ISIN 425 Data Structures & Algorithms (unstructured data)	3
ISIN 429 Legal & Ethical Issues	3
*ISIN 406 Advanced Programming	3

Core Stats Courses

STQM 260 Statistics	3
STQM 270 Introduction to Data Mining	3
STQM 285 Foundations of Business Analytics	3



	STQM 322 Inferential Statistics	3
	STQM 342 Data Mining Tools	3
	STQM 375 Programming for Analytics	3
	STQM 421 Applied Linear Statistical Models	3
	STQM 465 Text and Web Mining	3
Core AI		
	*ATIN 3xx AI Concepts and Problem Solving	3
	*ATIN 3xx Machine Learning	3
	*ATIN 3xx Natural Language Processing	3
	*ATIN 4xx Computer Vision (biometrics and graphics)	3
	*ATIN 4xx AI Architecture & Design (cloud resources such as AWS)	3
	*ATIN 4xx Deep Learning	3
	*AITN 380 Emerging Topics in AI	3
	*ATIN 491 Internship	3
	*AITN 499 Capstone	3
Business		
	MKT 321 Principles of Marketing	3
	PROJ 320 Project Management	3
Gen Ed		
	Required: Psychology, Sociology, Gen Ed	40
	* Some sort of (new) Psychology course dealing with influence and perception (Russia in the 2016 election type of thing)	
		124 credits
Degree Total		

\* indicates new course

2. Target date for implementation. Fall 2020
3. Briefly explain the rationale for this initiative. If the initiative involves customization of an existing program for delivery to an off-campus cohort group, also explain the nature of the proposed curricular customization. Artificial Intelligence is one of the fastest growing fields in the world. AI investment in the US is projected to grow from \$8 billion in 2016 to \$47 billion in 2020. Initially the AI program is planned for on campus delivery, although some currently existing courses within the proposal are also offered in online and hybrid environments.
4. Are there similar programs at other Michigan universities? If so, where? What is the enrollment in the other programs? The first BS in Artificial Intelligence in the United

States was offered by Carnegie Mellon University beginning Fall 2018. There is an Artificial Intelligence presence at the University of Michigan, but it is listed as a computer science/electrical engineering option rather than a formal degree program.

5. **Briefly explain any similarities of the proposed initiative (program objectives and/or curriculum) with already established FSU or KCAD programs:** The primary program similarities exist in ISI and Data Analytics, the primary sponsors of this proposal. Peripheral synergies include Computer Information Systems. This proposal would leverage well with the cloud initiatives with Rockford, Forest Hills, Kentwood and Big Rapids Public Schools.
6. **Briefly describe indicators of the employment market for students completing this Initiative, including sources used for employment information/data.** Data Scientist jobs are projected to grow by 40% year over year through 2020. Data Science has been identified as the highest starting salary career (Glassdoor, 2019). In addition to coastal tech hubs, several other cities offer unique tech opportunities, including Huntsville, Alabama and Detroit, Michigan. (Bloomberg, 2019). A FSU Board member has identified AI as an area of interest.
7. **Briefly describe indicators of potential student interest/demand for the new initiative, including sources used for student market information/data.** Carnegie Mellon offered the first BS in AI in 2018 to strong student demand. Dutch universities are experience strong student interest in AI programs. Berkley created a new Data Sciences Division due to soaring student interest (Chronicle, November 1, 2018). Student enrollment grew from 100 in 2015 to 1,300 in 2018. Data Science/Artificial Intelligence is significantly underserved in Michigan.
8. **To what extent will this initiative draw new students to FSU or KCAD? To what extent will it draw students from existing programs?** The ISI program was a new programmatic area for FSU that drew from a new student base. It is anticipated that the proposed AI degree will also be a new programmatic area that also draw from a new, currently underserved, student base. In the past few years AI has grown from a niche area to a dominant business driver with application in cyber security, health care, autonomous vehicles, manufacturing and consumer behavior.
9. **Approximately how many students are expected to enroll? Include rationale for estimates.**

15 students in the first year and 50 students after three years.

Rationale for estimates is dependent on the degree to which FSU markets the program. Given appropriate attention, this could enroll more than the projected students within three years. AI is in a similar position that ISI was when it was deployed in 2007, so projections are based upon the same projections used when ISI was launched.
10. **At which FSU campuses/regional centers or other sites will the initiative be offered?** FSU main campus, with the capability of approximately 50% of the degree capable of being offered online or in a two way interactive video model. Depending on the evolving distance learning ecosystem at Ferris it may be possible to provide a larger portion of the degree online in some fashion.

11. Will Internet or other distance learning technology be used for course/program delivery? Describe. This program will be heavily dependent on cloud technology including leveraging our Amazon Web Services Academy, College of Business rooms 110 & 130, cloud and FSU distance learning technology.

Complete questions 12, 13, 14 in consultation with department administrator and/or dean.

12. Provide a rough estimate of the resources needed to implement the initiative. Please attach a three year budget to include faculty salaries plus benefits, library materials estimate, equipment and classroom materials estimate, and renovation estimate. Budget is at the end of this document.
13. Project the resources that could come from reallocation within the department or college and the new resources that would be required. One Data Analytics faculty member has extensive industry experience in machine learning. Two tenure-track ISI faculty and one adjunct faculty member have extensive database and software development experience. One ISI faculty member is an Amazon Certified Solutions Architect and one is pursuing Amazon Big Data/Machine Learning Certification. Because of the heavy utilization of existing ISI and Data Analytics courses only one AI course would need to be offered the first year (2020/2021) and four courses the second year (2021/2022). A full course schedule would not need to occur until year three (2022/2023).
14. Are there new space needs? If so, how much? How would the space be used? Has existing space been identified? If so, where? Is renovation/remodeling necessary? A series of two grants were received by the ISI program that included developing COB 130 into a facility with synchronous distance education capability. A subsequent grant was received by the ISI program in 2019 allowing COB 110 to be developed into a similar facility. COB 110 was previously underutilized, so the combination of COB 110, 130 and 310 (current Statistics classroom) will provide adequate space needs for the next few years. The Virtual Learning Center is being developed with space for ISI, MISI, Business Data Analytics, Project Management and the proposed Artificial Intelligence program, which will provided enhanced space supporting each program.
15. Is there professional accreditation for the program? Is it required or voluntary? Will accreditation be sought, and when? What will be the one- time and ongoing costs of accreditation? The ISI program is undergoing ABET Accreditation as cyber security accreditation just became offered in 2019. There currently is no Artificial Intelligence accreditation but ABET is the logical accrediting agency and accreditation will be pursued when it is available.
16. Has there been preliminary discussion with other departments/colleges that will be involved in course/program delivery? If yes, what was the feedback? There has been preliminary discussion at the COB level and initial exploratory discussion with other colleges to determine interest in collaboration.

Department Faculty's signature: Greg Gogolin, Ph.D. Digitally signed by Greg Gogolin, Ph.D.  
DN: cn=Greg Gogolin, Ph.D., o=FSU, email=gogolin@fermmedia.cofsu.edu, Date: 2019.07.23 22:40:31 -0400 Date 7/23/2019

Note: Faculty signatories are tenure-track faculty who are involved with initiation of the proposal or who are collaborating with an administrator on the proposal.

Comments:

Department Administrator's signature: J. H. Bejir Date 8/1/19

Note: If this is an interdepartmental initiative, include additional Department Administrator signatures

Comments:

Dean's signature: \_\_\_\_\_ Date 8/1/19

- For cross-college initiatives, include additional signature(s) of Dean(s)
- For existing programs customized for off-campus delivery to a cohort group, include College and EIO Deans' signatures

Comments:

KCAD President's signature: \_\_\_\_\_ Date \_\_\_\_\_  
(KCAD proposals only)

- For KCAD initiatives, include KCAD President's signature

Comments:

Provost's Signature: Paul Blatz Date 8/22/19

Approved - Approval indicates permission to develop the full proposal. It does not assure final approval.

Comments and/or suggestions:

Not approved - Explanation:

c. Initiator(s)

- Department Administrator(s)
- Deans' Council
- University Curriculum Council
- Academic Senate
- VPEIO
- Provost
- FSU Intranet

Program Budget – B.S. Artificial Intelligence

	Year 1	Year 2	Year 3
<b>Salaries</b>			
Advisor	12,000	12,000	12,000
Current ISI adjunct faculty member plus benefits (25% assignment)		18,000	18,000
Adjunct part-time		7,600	15,200
New AI adjunct faculty member plus benefits		72,000	73,000
New AI faculty member plus benefits			140,000
<b>Library materials</b>			
Online (current acceptable)	0	0	0
<b>Facility enhancements</b>			
AI devices	3,500	5,000	10,000
Office materials	1,000	1,000	1,000
Cloud storage	3,000	10,000	10,000
Software	2,000	5,000	10,000
<b>Other</b>			
Faculty Training	10,000	10,000	10,000
AI Competitions	2,000	3,000	5,000
<b>Marketing</b>			
Website development	10,000	2,000	2,000
Materials/giveaways	1,500	1,500	1,500
Website seeding/analytics	1,500	1,500	1,500
	\$46,500	\$148,600	\$309,200

References

Bloomberg, 2019. <https://www.bloomberg.com/news/articles/2019-05-15/big-data-skills-earn-high-pay-for-today-s-college-graduates>  
 Glassdoor, 2019.

# Bloomberg

---

## Highest Paying Jobs for New Grads

<b>Entry-level Job</b>	<b>Base Salary</b>
Data Scientist	95,000
Software Engineer	90,000
Product Manager	89,000
Investment Banking Analyst	85,000
Product Designer	85,000
UX Designer	73,000
Implementation Consultant	72,000
Java Developer	72,000
Systems Engineer	70,000
Software Developer	68,000

Source: Glassdoor