

The University Senate of Michigan Technological University

Proposal 16-24

Establishment of a New Graduate Certificate in Artificial Intelligence (AI) for Business Information Systems

(Voting Units: Academic Only)

Submitted by: College of Business

Basic Program Information

Primary Contact: Jeffrey Wall, Associate Professor of MIS, College of Business

Program Degree Type: Graduate Certificate

Program Title: Graduate Certificate in Artificial Intelligence (AI) for Business Information Systems

Planned Implementation Date: Fall 2024

Program Location/Modality: Campus/face-to-face or remote/synchronous

Target Student Population:

The new certificate is targeted toward existing graduate students in the Tech MBA, Master's in Accounting, Master's in Engineering Management, Master's in Data Science, and Master's in Applied Computer Science programs where some of the courses in the proposed certificate are required or elective courses in these Master's programs. The new certificate also provides a foundation for degrees in Financial Technology, Business Computing, AI for Business, or other Master's degrees that could be proposed to target new student populations. Further, the certificate provides another business option for the 9-12 credits of Application Area Electives for the new Master's in Applied Computer Science program.

General Description and Characteristics of the Program:

General Description: The certificate in AI for Business Information Systems is a 9-credit graduate certificate designed to support graduate students in business programs to explore how information technology and AI can support business strategy and operations. The certificate is also designed to support graduate students in Data Science and Applied Computer Science programs who wish to explore the application of data science and computing to business. The certificate also presents an opportunity to create future stackable graduate degrees related to business technology, such as Financial Technology, Business Computing, AI for Business, etc.

Catalog Description: The certificate in AI for Business Information Systems prepares students to understand how information technology, AI, and machine learning can be used within organizations to support strategic and operational business objectives.

Rationale:

Information systems sit at the intersection of business, AI, and information technology. A graduate certificate in AI for Business Information Systems will provide students completing computing and business degrees with information about how to use information technology and AI to support business strategy and operations.

Further, the Data Science Executive Committee that advises on curricular changes to the Master's in Data Science program has long requested that the MIS faculty elevate some courses to the graduate level to provide Data Science students with 5000-level elective courses. This proposal includes two new graduate level courses in MIS (using dual-listing with 4000-level MIS courses) to support this request.

The proposed certificate can also act as part of future stackable Master's degree programs at the intersection of business, computing, and AI.

Related Programs:

Within MTU:

- a) ***Certificate in Accounting Analytics*** – a 9-credit certificate that focuses on the use of analytics within accounting. One of the elective courses for the Accounting Analytics certificate is also contained in the AI for Business Information Systems certificate, namely BA 5200.
- b) ***Certificate in Data Science Foundations*** – a 9-credit certificate that focuses on the utilization of computing and mathematics to answer questions with data. One of the elective courses for the Data Science Foundations certificate is also contained in the AI for Business Information Systems certificate, namely BA 5200.
- c) ***Certificate in Forensic Accounting*** – a 9-credit certificate that focuses on accounting audits and forensic accounting examinations. One of the elective courses for the Forensic Accounting certificate is also contained in the AI for Business Information Systems certificate, namely BA 5200.

At Other Institutions:

- a) **[Graduate Certificate in Artificial Intelligence at George Washington U](#)** – a 12 credit graduate certificate (9 required credits with 3 elective credits) focused on AI for business.
- b) **[Graduate Certificate in Artificial Intelligence for Business at Deakin U](#)** - a 4 unit graduate certificate focused on AI and machine learning for business.
- c) **[Certificate in Management Information Systems at Oakland U](#)** – a 15

credit graduate certificate (3 required credits with 12 elective credits) cutting across a variety of MIS topics.

- d) [**Certificate in Enterprise Systems \(SAP\) at Central Michigan U**](#) – a 16 credit graduate certificate that prepares students to work with the SAP enterprise resource planning system.
- e) [**Specialization in Management Information Systems at Michigan State U**](#) – a 15 credit graduate specialization (9 required credits with 6 elective credits) cutting across a variety of MIS topics.
- f) [**Certificate in Information Technology Governance at Eastern Michigan U**](#) – a 15 credit graduate certificate (9 required credits with 6 elective credits) cutting across a variety of MIS topics.

Projected Enrollment:

The following table shows projected enrollment for the certificate

Academic Year	Projected Enrollment	
	<i>On Campus</i>	<i>Remote</i>
2024-2025	2-4	2-4
2025-2026	4-6	4-6
2026-2027	7-15	7-15
2027-2028	10-20	10-20

It is expected that around 60 percent of this enrollment will come from Data Science Master’s students interested in business domain knowledge, 30 percent of the enrollment will come from students in business Master’s programs interested in more business-technical knowledge, and 10 percent will come from other areas. This is based on interest expressed in the BA 5200 course.

The courses for the graduate certificate can support the increase in enrollment without further faculty lines.

There is also the potential to offer an asynchronous online certificate in the future if market analysis suggests it as a viable option. However, that option will require an additional faculty line and is not currently under consideration.

Curriculum Details

Learning Goals:

Upon successful completion of the graduate certificate, students will be able to:

- 1) Evaluate the strategic business value of an information technology with AI-enabled features
- 2) Utilize AI and machine learning to solve a business problem or answer a business question
- 3) Manage an information systems project with AI-enabled features

Assessment Plan:

The following table shows the anticipated assessment plan. Assessment primarily takes place in the two required courses.

Learning Outcome	Assessment Location	Assessment Type
Evaluate the strategic business value of an information technology with AI-enabled features	BA 5200 – Information Systems Management and Data Analytics	Papers and essays
Utilize AI and machine learning to solve a business problem or answer a business question	MIS 5000 – Emerging Technologies	Course project and programming assignments
Manage an information systems project with AI-enabled features	BA 5200 – Information Systems Management and Data Analytics	Course project and reflection papers

Curriculum Design:

Total credits required: 9 credits

Required Courses (6 credits):

BA 5200 Information Systems Management and Data Analytics (3 credits): offered yearly in the Fall and Spring semesters. Remote synchronous capabilities already utilized in this course with existing campus technology.

MIS 5000 Emerging Technologies (3 credits):

offered yearly in the Fall semester. Remote synchronous capabilities can be utilized for this course with existing campus technology.

Pre-requisites: (MIS 2100 and MIS 3200) or (CS 2321 and CS 3141) or BA 5200(C) or UN 5550(C)

Elective Courses (select 3 credits):

MIS 4400 Business Intelligence and Data Analytics (3 credits):

offered yearly in the Spring semester. Designed to support graduate students. It is currently taken by many graduate students in the Data Science program. Remote synchronous capabilities have been utilized for this course with existing campus technology.

MIS 5100 IS Projects (3 credits):

offered yearly in the Spring semester. Remote synchronous capabilities have been used for this course with existing campus technology.

Pre-requisites: (MIS 2100 and MIS 3100 and MIS 3200) or (CS 2321 and CS 3141 and CS 3425) or (MIS 2100 and MIS 3100 and MA 3720) or BA 5200 or UN 5550

New Course Descriptions:

The following new courses, which are listed in the curriculum design, will be offered for the certificate. All other courses already exist. To maximize utilization of existing MIS faculty lines and courses, the new 5000-level MIS courses will be dual listed with existing 4000-level MIS courses. The 4000-level variants of these courses already exist; only the 5000-level dual listed course is new. New course add forms and sample syllabi were submitted with this proposal.

MIS 4000/5000 Emerging Technologies:

Focuses on understanding IT for competitive advantage and as an agent of transformation. Topics include managing IT infrastructure and architecture, facilitating information distribution throughout the enterprise, business applications for machine learning and artificial intelligence, and other emerging trends and technologies.

This new 5000 level course includes different learning outcomes and additional readings and assignments for the graduate students to elevate the level of the content.

MIS 4100/5100 Information Systems Projects:

MIS capstone course. Applies IS practices and artifacts as solutions to business problems using student-led project teams under faculty supervision. Students develop a working prototype of a business solution using good design and management practices.

This new 5000 level course includes different learning outcomes and additional assignments and leadership requirements for the graduate students to elevate the level of the content.

Model Schedule:

The program can be completed in 2 semesters

Fall start:

Fall	Spring
BA 5200 (3 credits): required MIS 5000 (3 credits): required	MIS elective credit (0-3 credits)

Spring start:

Spring	Fall
BA 5200 (3 credits): required MIS elective credit (0-3 credits)	MIS 5000 (3 credits): required MIS elective credit (0-3 credits)

Faculty Qualifications:

[Dr. Mari Buche](#) – Professor of Management Information Systems

[Dr. Jeffrey Wall](#) – Associate Professor of Management Information Systems

The MIS faculty have all taught graduate-level MIS courses at Michigan Tech and

have taught or supervised remote synchronous graduate courses, including hybrid courses with face-to-face and remote synchronous students.

Resources Needed to Support the New Program

Library and Other Learning Resources Needed:

No additional library or learning resources are needed beyond those currently offered.

Suitability of Existing Space, Facilities, and Equipment:

BA 5200 and other undergraduate courses have supported face-to-face, remote synchronous, and hybrid face-to-face/remote synchronous modes with existing classroom spaces.

Program Costs:

As the certificate is currently designed to support existing graduate students by utilizing existing courses or dual listed courses, no new resources are required for the certificate. If the certificate is later used within a Master's degree to attract new students, marketing costs will be incorporated into that Master's degree proposal.

Again, there is the potential to offer an asynchronous online certificate in the future if market analysis suggests it as a viable option. A future asynchronous option may require additional faculty resources at that time. An asynchronous version of BA 5200, one of the required courses for the certificate, is already under development in support of the online MBA program.