Michigan Tech

Office of the Provost and
Senior Vice President for Academic Affairs

Office Memo

Phone: (906) 487-2440
Fax: (906) 487-2935

TO: Richard Koubek, President

FROM: Jacqueline E. Huntoon, Provost & Senior Vice President for Academic Affairs

DATE: November 15, 2021

SUBJECT: Senate Proposal 5-22

Attached is Senate proposal 5-22, "Proposal for a Minor in Business IT Solutions," and a memo stating the Senate passed this proposal at their November 10, 2021 meeting. I have reviewed this memo and recommend approving this proposal.

I concur_____X_____   do not concur_____   with this recommendation.

_____   11/16/21
Richard Koubek, President   _____
                                                                      Date

DATE:	November 11, 2021
TO:	Richard Koubek, President
FROM:	Sam Sweitz University Senate President
SUBJECT:	Proposal 5-22
COPIES:	Jacqueline E. Huntoon, Provost & Senior VP for Academic Affairs

At its meeting on November 10, 2021, the University Senate approved Proposal 5-22, "Proposal for a Minor in Business IT Solutions". Feel free to contact me if you have any questions.

The University Senate of Michigan Technological University

Proposal 5-22

(Voting Units: Academic)

Proposal for a Minor in Business IT Solutions

1. Date of Proposal:
02/22/2021

2. Proposer(s) Contact Information:
- *Primary Contact:* Jeffrey Wall, Associate Professor of Management Information Systems, COB, jdwall@mtu.edu
- Mari Buche, Professor of Management Information Systems and Associate Dean, COB, mwbuche@mtu.edu
- Kelly Steelman, Associate Professor of Cognitive and Learning Sciences, steelman@mtu.edu
- Marika Seigel, Associate Professor of Rhetoric and Technical Communication, Humanities, maseigel@mtu.edu
- Mary Raber, Professor of Practice, Pavlis Honors College, mraber@mtu.edu

3. Interdisciplinary Programs:
N/A

4. General Description:
The College of Business (COB) with the support of IDEA Hub proposes the creation of a new minor in Business IT Solutions. The Minor in Business IT Solutions will provide students with a foundational knowledge about how IT systems and business processes are designed, implemented, used, and managed in organizational settings to produce business value. Students will learn to analyze business problems and propose and design processes and technical solutions to remedy the problems. Students apply knowledge through hands-on learning experiences in the classroom.

Catalog Description:

The Minor in Business IT Solutions provides students with a foundational knowledge about how IT systems and business processes are developed, used, integrated, and managed in organizational settings to produce value for businesses and customers. Students learn to analyze business problems and propose and design processes and technical solution integrations to remedy those problems. Students apply knowledge through hands-on learning experiences in the classroom.

Learning Goals:

Although each course in the minor has its own set of learning objectives, the larger objectives that students should meet after completing the minor, particularly through the required courses, include:

- Identify how computing is used and managed within organizations to meet customer needs and produce business value.

- - Introduced in MIS 2000 and reinforced in MIS 3200, which are core requirements for the minor.
  - Model data based on an understanding of a specific business domain and implement a database based on the data models. Query and manipulate data within the database.
    - Introduced in MIS 3100 and reinforced in MIS 3200, which are core requirements for the minor.
  - Demonstrate fundamental skills in writing computer programs using industry standard programming languages.
    - Introduced through MIS 2100 or one of the CS courses listed under the programming requirements.

5. Title of Program:
Minor in Business IT Solutions

6. Rationale:
The Management Information Systems (MIS) Corporate Advisory Board in 2019 suggested that the MIS area should develop a minor for students across campus. The board believes that the minor will help to round out students' technical knowledge by providing access to the business-side of computing. The minor is widely applicable to students in other disciplines who wish to use information technologies within the organizations they will work for, or to ensure that their IT departments are providing IT solutions that meet the needs of their respective departments.

7. Related Programs:
The Business IT Solutions minor is distinct from other minors on campus. The most closely related minor currently offered at Michigan Tech is the Computer Science minor. However, there is no major overlap in courses even though the proposed Business IT Solutions minor includes options for counting Computer Science programming courses (e.g., CS 1090, CS 1111, 1121, or 1131) instead of MIS 2100 (Intro to Business Programming) for the programming requirement. The courses in the Computer Science minor pertain more to nuanced aspects of software engineering, such as data structures, discrete structures, etc. The proposed Business IT Solutions minor focuses more on how computing and its integration into business processes are used to generate value within organizations and for customers. The Business IT Solutions minor also focuses more on how to analyze business requirements through interviews, observation, cost-benefit analyses, etc. to ensure that system designs meet business users' needs and benefit organizations.

The proposed minor aligns with the University's mission in the strategic plan to deliver "action-based education." As depicted in the learning objectives below, students will engage in IT projects to create databases and information systems to support business objectives. The minor also aligns with some of the University's Learning Goals, including Goal 6 (i.e., Information Literacy) and Goal 7 (i.e., Technology). Further, the minor aligns with the College of Business (COB) mission to provide experiential learning through the projects conducted in several of the proposed courses. The minor also aligns with the COB values to produce business-savvy STEM graduates, by offering a business perspective on computing and process design to STEM students.

Many universities with a degree in Information Systems Management, Management Information Systems, Computer Information Systems, or related programs also offer an associated minor. The minors at these schools serve the same purpose as the minor described in this proposal. Because of the large number of such minors, we do not provide an exhaustive list. Some programs include:

- Michigan State University has a minor in Information Technology (https://broad.msu.edu/undergraduate/programs/information-technology-minor/).
- Eastern Michigan University has a minor in Computer Information Systems (https://catalog.emich.edu/preview_program.php?catoid=25&poid=11692&returnto=5096).
- Western Michigan University has a minor in Computer Information Systems (http://catalog.wmich.edu/preview_program.php?catoid=7&poid=1494&returnto=183).
- Northern Michigan University has a minor in Information Systems (https://www.nmu.edu/bulletin/programs?processtype=self&action=ProgsByAlpha&phase=phase5&elementid=&subaction=1254168729).
- University of Michigan Dearborn has a minor in Information Systems Management/Information Technology Management (https://umdearborn.edu/cob/undergraduate-programs/majors-minors-curriculum/minors).

8. Projected Enrollment:

We expect the enrollment in the minor to reach a peak of 10-15 students enrolled at any given time, starting with 2-5 students in the first year.

9. Curriculum Design:

The following are the required and elective courses for the minor. No courses are offered online. No new courses are being proposed.

Required Courses (12 credits)

Core required courses (9 credits) – complete the three courses from this list.

Course Number	Course Title	Credit(s)	Offering
MIS 2000	IS/IT Management	3	Yearly in Fall & Spring
MIS 3100	Business Database Management	3	Yearly in Spring
MIS 3200	Systems Analysis and Design	3	Yearly in Fall

Required Programming Course (3 credits) – select one course from this list.

Course Number	Course Title	Credit(s)	Offering
CS 1090	Intro to Computing Principles	3	Yearly in Fall & Spring
CS 1111	Intro to Programming in C/C++	3	Yearly in Fall
CS 1121	Intro to Programming I	3	Yearly in Fall & Spring
CS 1131	Accelerated Intro to Programming	5	Yearly in Fall
MIS 2100	Intro to Business Programming	3	Yearly in Fall

Elective Courses (6 credits)

Select at least two courses from one of the elective areas below.

Elective Area: Usability and Human Factors in IT Design

Course Number	Course Title	Credit	Offering

MIS 2200	Web Programming	3	Every other year Spring
MIS 3500	User-Centered Design	3	Every other year Spring
HU 2642	Intro to Digital Media	3	Yearly in Fall
HU 3120	Technical and Professional Communication	3	Yearly in Fall & Spring
HU 4628	Usability Evaluation and User Experience Design	3	Yearly in Spring
PSY 3850	Human Factors Psychology	3	Every other year Spring
PSY 4015	Cognitive Task Analysis Methods	3	Every other year Fall

Elective Area: Systems Thinking for Design

Course Number	Course Title	Credit	Offering
MIS 3500	User-Centered Design	3	Every other year Spring
MIS 4000	Emerging Technologies	3	Every other year Fall
ENG 1505	Introduction to Systems Engineering	1	Yearly in Spring
ENG 2505	Low Fidelity Systems Modeling	3	Yearly in Spring

Elective Area: Data and IT

Course Number	Course Title	Credit	Offering
MIS 4400	Business Intelligence	3	Every year
MIS 4000	Emerging Technologies	3	Every other year Fall
MA 2330	Introduction to Linear Algebra	3	Yearly in Fall & Spring
MA 3740	Statistical Programming and Analysis	3	Yearly in Fall & Spring

Total Credit Required = 18 credits

Prerequisites

Courses listed in this minor have the following prerequisites. Concurrency is illustrated by the letter C:

MIS 2000: CS 1121 or CS 1131 or ENG 1101 or (ENG 1001 and ENG 1100) or SAT 1200
MIS 2100: N/A
MIS 2200: MIS 2100 or CS 1121 or CS 1131
MIS 3000: MIS 2000
MIS 3100: MIS 2000(C)
MIS 3200: MIS 2000(C)
MIS 4400: MIS 2000 and (MIS 3100 or CS 3425)
MIS 3500: MIS 2000
MIS 4000: MIS 3100 and MIS 3200
MIS 4200: MIS 2000 or CS 1111 or CS 1121 or CS 1131
CS 1111: N/A
CS 1121: MA 1031(C) or MA 1032(C)
CS 1131: MA 1031 or MA 1032 or MA 1160(C) or MA 1161(C)
HU 3120: UN 1015 and (UN 1025 or Modern Language - 3000 level or higher)
HU 2642: N/A
HU 4628: HU 3120 and UN 1015 and (UN 1025 or Modern Language - 3000 level or higher)

PSY 3850: PSY 2000
PSY 4015: PSY 2000
ENG 1505: ENG 1001 or ENG 1101 or CS 1121 or CS 1131 or MIS 2100
ENG 2505: ENG 1505(C) and MA 2160 and (ENG 1102 or CS 1121 or CS 1131 or MIS 2100)
MA 2330: MA 1160 or MA 1161 or MA 1135
MA 3740: MA 2710 or MA 2720 or MA 3710 or MA 3715

Enrollment Restrictions
The Business IT Solutions minor will not be available to students majoring in any degree offered by the College of Business (COB). COB students should complete a dual major in MIS as opposed to the minor.

10. New Course Descriptions:
No new courses are required for the proposed minor

11. Model Schedule:
The program could be completed in as little as two years, with the ability to be completed at a more comfortable pace over four years. MIS courses do not have long prerequisite chains. As long as a student takes MIS 2000 early, the remaining courses can be taken in a variety of sequences. The table below shows some possibilities.

Year 1	Year 1
Fall	Spring
MIS 2000 (3 credits) **or** MIS 2000 and elective course (6 credits)	MIS 3100 (3 credits) **or** MIS 3100 and elective course (6 credits)
Year 2	Year 2
Fall	Spring
MIS 3200 and Programming requirement or elective course (6 credits)	Programming or elective course (3 credits)

12. Library and Other Learning Resources:
Many of the MIS courses are taught in computing labs, primarily Chem Sci 108. Other than these existing labs used for the MIS degree program, no other library or lab resources are required for the minor.

13. Description of Available/Needed Equipment:
No additional equipment is necessary.

14. Program Costs:
MIS courses have adequate space for additional students. With current MIS faculty and open faculty lines, our courses can sustain an additional 15-20 students in the minor given the current number of MIS majors. Given expected enrollments in the program, we should still have space in MIS courses for growth of the major as well.

We foresee no additional costs with the creation of the minor.

15. Accreditation Requirements:
Will be designed in accordance with AACSB accreditation standards.

16. Planned Implementation Date:
We seek to implement the minor as early as Fall 2022.