Michigan Tech

Office Memo

Office of the Provost and
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TO: Richard Koubek, President

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

DATE: February 21, 2020

SUBJECT: Senate Proposal 28-20

Attached is Senate proposal 28-20, "Recommendation: The College of Computing requests to establish a Department of Applied Computing," which the Senate passed at their February 19, 2020 meeting.

I appreciate the feedback presented to me by the University Senate, and I recommend that you acknowledge this recommendation.

I concur ___X___   do not concur_____   with this recommendation.

_____   2/27/20
Richard Koubek, President   Date

DATE:	February 20, 2020
TO:	Richard Koubek, President
FROM:	Michael Mullins University Senate President
SUBJECT:	Proposal 28-20
COPIES:	Jacqueline E. Huntoon, Provost & Senior VP for Academic Affairs

At its meeting on February 19, 2020, the University Senate approved Proposal 28-20, "Recommendation: The College of Computing requests to establish a Department of Applied Computing". Feel free to contact me if you have any questions.

The University Senate of Michigan Technological University

Proposal 28-20

Recommendation: The College of Computing requests to establish a Department of Applied Computing

Date: January 24, 2020

To: Adrienne Minerick, Dean, College of Computing

From: Daniel R. Fuhrmann, Director, CNSA/MERET/HI Division

Re: Establishment of a Department of Applied Computing

The faculty members in the Computer Network and System Administration (CNSA)/Mechatronics, Electrical, and Robotics Engineering Technology (MERET)/Health Informatics (HI) Division of the College of Computing recommend the establishment of a Department of Applied Computing within the College, and that the faculty and academic programs currently in the CNSA/MERET/HI Division transition into the new Department.   Creation of such a department will place the CNSA/MERET/HI faculty and programs in a structure that is recognized by the University, removing any ambiguity about faculty status, reporting lines, procedures for tenure, promotion, and reappointment, and responsibility for academic programs.   It will further strengthen the College of Computing by having two academic departments with distinct and complementary missions, giving it a unique brand identity in Michigan and nationwide and creating a strong value proposition for prospective students.   This in turn will contribute to the University's aim to have the College of Computing play a central role in the growth of Michigan Tech over the next 10-20 years and beyond.

Rationale

When the College of Computing was launched on July 1, 2019, there were two faculty groups that were brought together: the faculty of the Department of Computer Science, formerly part of the College of Sciences and Arts, and the faculty in the programs in Computer Network and System Administration, Electrical Engineering Technology, and Health Informatics, formerly part of the School of Technology.   On the launch date of July 1, the internal structure of the College was not yet decided.   While discussions regarding structure were ongoing, the interim solution of creating a "Division," led by a "Division Director" for the CNSA, MERET, and HI faculty, was put in place.   The words "division" and "director" are not standard in the Michigan Tech vernacular and hence the meaning and the status of this particular group has been uncertain for over six months.   It was widely understood that the College structure, with one department and one division, was temporary and that a long-term solution was needed.

The department structure at Michigan Tech is well-known and well-understood, and indeed that it has served the university well.   The mission of an academic department, the role of the department chair, the processes for tenure, promotion, and reappointment are all things with which we are familiar.   We know how to work within that system to promote faculty success and positive

student outcomes.   The recognition of the value of the academic departments was central to the decision to keep the Department of Computer Science relatively intact as it transitioned from the College of Sciences and Arts to the new College of Computing.

There are two compelling reasons for the CMH Division to become an academic department.   The first is one of size.   None of the constituent groups within the CMH Division has sufficient numbers of faculty or students to become economically sustainable as a standalone department.   Second, there are tremendous opportunities of synergy across the CMH programs, and their combined potential to be leaders in technological disruptions aimed to improve industry and society.   One of the central tenets of the discussion that led to the creation of the College of Computing was the convergence of physical technology and cyber technology, often embodied in the term "Fourth Industrial Revolution" or the closely-related paradigm of "Industry 4.0."   In the proposed Department of Applied Computing we have opportunities realize that convergence in our own scholarly activity.   For example, in the MERET group we are creating a new BS in Mechatronics, bringing together the physical technologies of electrical and mechanical systems with computing technologies of artificial intelligence and cybersecurity.   The CNSA group will expand its expertise from enterprise Information Technology (IT) to cybersecurity for both enterprise and industrial applications.   The HI group is bringing enterprise IT solutions as well as artificial intelligence and data analytics to problems in the healthcare industry, including those that touch on traditional engineering disciplines such as biomedical engineering and medical imaging.   The faculty and the academic programs in the proposed Department of Applied Computing have the potential to be much more than the sum of the parts.

The name of the proposed department is broad and leaves room for expansion and evolution of our mission.   It makes clear two important facts.   First, in our educational and research programs, we will emphasize practical *applications*, turning out students with hands-on experience and encouraging close faculty relationships with industry.   Second, all of our programs have a significant *computing* component.   While the name is not fully descriptive of all the programs included within the department, it has the advantage of being clean and succinct.   We avoid the temptation of creating a more precise but overly long department name.

Mission and Vision

The mission of the proposed Department of Applied Computing is to offer academic programs and conduct applied research in computer network and system administration, cybersecurity, electrical engineering technology, mechatronics, and health informatics.

The faculty in the proposed Department of Applied Computing supports President Koubek's vision of university growth to 10,000 students.   We see the College of Computing playing a central role in that growth, perhaps *the* most important role.   As one of five colleges at Michigan Tech, we project

having responsibility for some 20% of the student body, or 2000 students in round numbers.   As the smaller of two departments within the College, we feel that growth in Applied Computng to 500 students and some 25 tenured/tenure-track and non-tenure track faculty, at a 20:1 student-faculty ratio, is within the realm of possibility.

Beyond simply numbers of students and faculty, however, is the vision for what a Department of Applied Computing can bring to the College of Computing and to Michigan Tech.   We see a department that has a very clear computing focus and has a natural home in the new College, but which has a mission and vision that is distinct from, and complementary to, those of the Department of Computer Science.   Our domain of expertise will be the *application* of the foundations of computing and computer science to the domains of computer networks, system administration, cybersecurity, industrial control and automation, and health informatics.   We see growth areas in the technologies often associated Industry 4.0, such as the Industrial Internet of Things (IIoT), robotics, cloud computing, and digital twins.   We also see growth opportunities in new technologies associated with health care, such as artificial intelligence in health (esp. medical imaging), mobile health applications, and information governance and risk assessment.   We can provide a bridge to other units on campus with related interests, such as the new Department of Mechanical and Manufacturing Engineering Technology, the Department of Electrical and Computer Engineering, the Department of Mechanical Engineering-Engineering Mechanics, the Department of Biomedical Engineering, and the College of Business.   In realizing this vision, we believe that we offer the College of Computing a unique identity, an opportunity for branding, and a value proposition for prospective students that is consistent with the mission and vision of Michigan Tech, and unique in the State of Michigan.

Structure and Governance

There will be three groups within the Department of Applied Computing, as shown in the table below, along with the academic degree programs for which they are responsible.   Faculty members may belong to more than one group.   Each of these groups will have a leader, and the group leaders and the department chair will work together in administering the academic programs. The department chair and the three group leaders will form the departmental Executive Committee. The Executive Committee will work to coordinate all the department programs with a goal for building synergy and improving communication across the group boundaries.

CNSA	MERET	HI
BS in Computer Network and System Administration	BS in Electrical Engineering Technology	MS in Health Informatics
BS in Cybersecurity (joint w/ CS)	BS in Mechatronics (joint w/ MET, CS, and CNSA)	
Minor in Cybersecurity	MS in Mechatronics	
	Minor in Data Acquisition and Industrial Control	

More details about the governance and processes of the new department will be available in the charter once it is written by the department faculty and approved by university administration.

Support

The faculty in the CMH Division, which includes 10 full-time faculty members, 1 part-time faculty member, and 1 faculty member with a minority joint appointment, favor the proposed formation of the Department of Applied Computing by a vote of 11 in favor, 0 against, and 1 abstention.   The vote comes with a proviso that University Marketing and Communications carry out a due diligence process to determine if the name "Applied Computing" is appropriate for the combination of programs for which the department is responsible and the image that we wish to project.

Immediate Action Items

We recommend that the new Department of Applied Computing begin operation under the new structure on July 1, 2020.

There are two important tasks remaining in the Spring 2020 semester, the writing of a charter and the selection of a chair.   These must take place sequentially.   Following the approval of this recommendation by the Michigan Tech Board of Trustees, which we optimistically anticipate happening at their meeting on Friday, February 28, 2020, the CMH Division faculty will work to prepare a departmental charter and submit it to the university administration for approval within 30 days.   The charter will include provisions for the selection of a department chair.   Immediately following the approval of the charter, the search process for a chair or an interim chair will begin, with the goal of having someone prepared to assume this role at the July 1 launch date.

Date: January 27, 2020

To: Jacqueline Huntoon, Provost and Senior Vice President for Academic Affairs

From: Adrienne R. Minerick, Dean, College of Computing

Re: Establishment of a Department of Applied Computing

I concur with the recommendation from the Director of the Division of Computer Network and System Administration (CNSA)/Mechatronics, Electrical, and Robotics Engineering Technology (MERET)/Health Informatics (HI).   The faculty vote is strongly in favor of the establishment of the Department of Applied Computing.

The faculty and academic programs currently within the CNSA/MERET/HI Division would then transition directly into the Department of Applied Computing once established, thus enabling a uniformity in reporting structure and procedures within the newly established College of Computing.

The memo from the CNSA/MERET/HI Division Director, Dr. Dan Fuhrmann, outlines the challenges associated with providing a unique identity for each of the academic programs while investing in a governance and reporting structure that is resource efficient.   I have thus advised the faculty within the CNSA/MERET/HI Division to develop a documented growth plan for the next five years for each of their degree programs.   This plan should identify resource pinch points such that strategic decisions can be made.   Thus, I recommend that three important tasks remain in the Spring 2020 semester: writing of a charter, selection of a chair, and development of a 5-year growth plan.

In summary, I support the recommendation that, once approved, a new Department of Applied Computing begin operation on July 1, 2020.