The University Senate of Michigan Technological University

Proposal 78-21

(Voting Units: Academic)

Proposal for a new Bachelor of Science degree in Human Factors

Department of Cognitive and Learning Sciences

1. **Date submitted:** 3/30/21

2. **Contact:**

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3. **Interdisciplinary support:** This proposal was developed in consultation with IDEA Hub's interdisciplinary education task force and is supported by the 21st Century Education Tech Forward Initiative.

4. **General description and characteristics of the program:**

   The proposed Human Factors (HF) Program requires 120 credits (plus co-curricular credits). It includes 43 core credits in human factors, 20-24 credits within one of four technical specialization areas, 12 elective credits in cognition, visual design, cultural competency, and usability; 8-10 credits of free electives, 24 credits of HASS (STEM requirements are embedded in the program), and 7 credits of a culminating experience.

   Program learning objectives are adapted from ABET student outcomes and are aligned with BCPE (Board of Certification in Professional Ergonomics) Core Competencies[1] in human factors analysis, design, implementation, and validation. Note that human factors is not an

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[1] https://www.bcpe.org/wp-content/uploads/BCPE-2019-Core-Competencies-3.25.20.pdf

ABET accreditable program; there is no accrediting agency for undergraduate human factors programs.

By the completion of this program, students will be able to:

a. identify, formulate, and address complex socio-technical problems by applying human factors methods, principles, regulations, guidelines, and standards.

b. apply human-centered design practices to identify requirements and produce solutions that enhance performance, safety, comfort, and well-being.

c. communicate effectively within multi-disciplinary teams and to a range of stakeholders and via multiple modalities.

d. recognize ethical and professional responsibilities in human factors research and design and make informed decisions through a systems approach that takes into account the global, economic, environmental, and societal contexts that impact human-technology interaction.

e. function effectively within a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

f. conduct user research and evaluation, analyze and interpret human performance data, and apply the results as part of an iterative design process.

g. acquire and apply new knowledge as needed, using appropriate learning strategies.

5. **Title of Program:** Human Factors (B.S.)

6. **Rationale:** Human factors psychology is an applied field of study that broadly covers how we work, use technology, and interact within small and large socio-technical systems. It encompasses and overlaps with a number of related specializations, such as ergonomics, engineering psychology, human-systems engineering, cognitive engineering, UI/UX, human-computer interaction, usability, industrial/organizational psychology, and human-centered design. Human factors is a necessary discipline in order to explore the central role that humans play in the 4th industrial revolution, and how technology can serve us and improve work, society, and life. Core skills of human factors practitioners are frequently listed among critical skills companies need[2]. The MTU department of Cognitive and Learning Sciences has offered a Ph.D. in Applied Cognitive Science and Human Factors since 2010, and our graduates are successfully working in academia, industry, and government laboratories. The purpose of the proposed program is to leverage the specialization we already have among faculty, graduate students, and courses to offer a

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[2]
https://www.linkedin.com/business/learning/blog/top-skills-and-courses/the-skills-companies-need-most-in-2020and-how-to-learn-them
https://www.uxdesigninstitute.com/blog/want-a-career-in-ux/

specialized course of study at the undergraduate level that is unique in the State of Michigan and the Midwest in general. This program will provide training that will permit graduates to leverage MTU's connections to industry in Michigan and the Midwest for internship and job placement, and will also provide additional students to complete the coursework-only and accelerated master's degree programs in Applied Cognitive Science and Human Factors.

7. **Related Programs:**

a. At Michigan Tech

At MTU, the main related undergraduate program is the BS in psychology, which is a general-purpose psychology degree focusing broadly on the science and practice of psychology. Although the proposed Human Factors major draws upon courses from the current psychology curriculum, the set of required courses in each major will differ by at least 50%. The department of Cognitive and Learning Sciences also offers graduate degrees in Applied Cognitive Science and Human Factors, including an accelerated coursework masters degree. We do not anticipate the proposed degree program will compete with the accelerated or research-only masters degree programs, but rather help recruit students into those programs as the masters degree provides additional higher-level coursework. Within other departments at MTU, there is some minimal overlap with undergraduate majors in communication studies, scientific/technical communication, computer science, social sciences, and medical devices/instrumentation (minor). We do not see the proposed program as competing with any of these other programs for students. Rather, we hope that other related programs may be able to take advantage of the more regular course offerings in human factors to enhance their majors or minors.

b. At other institutions

This major is comparable to several types of programs at other institutions: (1) human factors undergraduate tracks or concentrations in engineering psychology, human factors psychology, human-systems engineering, and similar program names, in departments without a graduate degree in psychology human factors; (2) UX/UI degrees or HCI focused undergraduate degrees, often offered in engineering, computer science, or other related departments.

Programs comparable to the proposed program are in category 1: undergraduate psychology majors with a track or concentration in human factors or a related topic. Nationally, there are 5 psychology departments offering undergraduate human factors or engineering psychology bachelor's degrees, and an additional 6 that offer certificates or concentrations as part of their psychology programs (normally specifying 4-5 specific courses that are needed; see Table 1). Of these 11 programs, 7 are at departments that have human factors graduate programs, but there are just 3 that offer both undergraduate and graduate degrees in human factors: MTU would join this small group that offers human factors undergraduate degrees in a department with a research identity and graduate-level programs in human factors. No programs exist in the state of Michigan or in the Great Lakes region, and the closest geographically are certificates offered at [Penn State Behrend](#) and

Wichita State University. Thus, the proposed program is filling a specialty niche (unlike our undergraduate psychology degree) and provides a unique program of training that cannot be matched within Michigan or nearby universities. Many of these undergraduate programs (with the exception of one at Embry-Riddle) are essentially a core of psychology courses with a heavy focus on cognitive science and perception, along with a handful of relevant courses in allied departments (engineering, computer science, design, etc.).

Table 1. Undergraduate majors and certificates in human factors psychology

University	Program Type	Program Name	HF Grad Program?
Central Florida	BS	BS in Psych.; Human Factors Track	MS/PhD
CSU East Bay	BS	BS in Psych. w/ Ergonomics and HF Option	No
Embry-Riddle	BS	BS in Human Factors Psychology	PhD
Georgia Tech	BS	BS in Psych. w/certificate in Eng. Psych	MS/PhD
Old Dominion	BS	BS in Psych. w/ HF Interest area	MS/PhD
Tufts	BS	BS in Engineering Psych.	No
George Mason	UG Certificate	Certificate in HF and Applied Cognition	MS/PhD
Penn State Behrend	UG Certificate	Human Factors certificate (any major)	No
Wichita State	UG Certificate	Certificate in HF Psychology (any major)	MS/PhD
University of Houston Clear Lake	UG Certificate	Certificate in Human Factors	MS
University of Utah	UG Certificate	Human Factors certificate (any major)	No

There is also a growing set of more specialized undergraduate degree programs focusing on UX/UI, human-centered design, and other similar topics. These degrees are often housed in engineering departments, computer science departments, or in design institutes. In addition, many offerings in this area involve short-course and online professional development certificates (completed in less than a week) which are a different market, with a focus on the

creative design process rather than the psychological foundations of human factors. Several undergraduate majors are being offered that focus specifically on one or another of our 4 specializations. Three geographically close programs that illustrate missions similar to different focuses of our major include: (1) a [User Experience B.S.](#) at the Milwaukee School of Engineering; (2) a [Human-centered Design concentration](#) at the NMU School of Art and Design; and (3) a [BS in Information with a focus on UX design](#) at the University of Michigan School of Information. Using these programs as representative examples, they differ from one another, but involve specialized courses relying on the strengths of the institutions they are housed within. The MSOE program involves extensive courses on communication, user experience, and design, and involves only 2 psychology courses. The NMU program involves 5-6 design-related courses with a single class in human factors. The UMSI program involves 6 courses on HCI/UX and 4 additional core courses in the information science major. Thus, these courses of programs are somewhat narrower than our proposed program course of study, with a stronger focus on design practice than on the study of the psychological foundations of human factors. Each of these programs represent universities that MTU competes with for recruiting students, but for which MTU currently has no similar degree. The proposed HF degree provides similar training to these programs.

8. **Projected capacity:**

Eight faculty (6 full-time T/TT faculty, 1 split appointment T/TT faculty, 1 lecturer) currently support a psychology major (N= 52), a psychology minor (N= 54), graduate programs in Applied Cognitive Science and Human Factors (N=26), and numerous courses per semester on the general education list. Given the current size of our faculty, we have the ability to accommodate the addition of 40 human factors students into our existing courses. Some courses (PSY 2800, PSY 3800, and PSY 4010) will need to be restricted to majors or have their capacities raised by 6-8 students per year. For PSY 2800 and PSY 4010, an increase in capacity would also mean that the courses would need to be relocated from Meese to classrooms elsewhere on campus that can accommodate 30+ students. To grow our overall undergraduate programs (psychology and human factors) beyond 100 students will require additional resources, which may include a faculty line to support additional sections and expanded course offerings and/or GTA grading support to facilitate larger class sections.

9. **Curriculum Design:**

Required courses - To obtain a B.S. degree in Human Factors, students will be required to take a minimum of 86-88 credits fundamental to understanding humans, technology, and the design of human-technological systems. This will include 43 credits in core human factors courses; 12 credits of elective courses in four areas: Cognition, Cultural Competency, Usability, and Visual Design; and 20-24 credits in a chosen technical concentration area (Systems Thinking and Design, Human-Computer Interface Design, Innovation and Human-Centered Design), or a self-designed emphasis area with the approval of the CLS undergraduate program committee). Students are also required to take 39 credits of general education, including 24 credits of HASS general education courses and 15 credits of STEM general education courses. Note that the STEM courses are embedded within the human

factors core and technical concentration areas. Finally, students will take 10-14 credits of free electives and 7 credits representing a culminating experience, for a total degree requirement of 120 credits. In line with university requirements, three credits of co-curriculars are also required.

Human Factors Core: 15 course, 43 credits

- BL 2010/2011: Anatomy and Physiology (4 cr) **[STEM]**
- HF 1000 Introduction to the Human Factors Major (1 cr)
- HF 2000 Introduction to Engineering Psychology and Human Performance (3 cr)
- KIP 4250 Ergonomics (3 cr)
- PSY 2720 Statistics for Behavioral Sciences or MA 2720 Statistical Methods (4 cr) **[STEM]**
- PSY 2800 Critical Thinking for Social and Behavioral Sciences (3 cr)
- PSY 3000 Research Methods & Statistics I (3 cr)
- PSY 3001 Research Methods & Statistics II (3 cr)
- PSY 3700 Industrial Organizational Psychology (3 cr)
- PSY 3800 Environmental Psychology (3 cr)
- PSY 3850 Human Factors Psychology (3 cr)
- PSY 4010 Cognitive Psychology (3 cr)
- PSY 4015 Cognitive Task Analysis (3 cr)
- PSY 4160 Sensation and Perception (3 cr)
- PSY 4500 Seminar (1 cr)

Cognitive Elective: 1 course, 3 credits (choose 1)

- PSY 3060 Brain and Behavior (3 cr)
- PSY 4110 Learning and Memory (3 cr)
- PSY 4750 Judgment and Decision Making (3 cr)

Cultural Competency Elective: 1 course, 3 credits (choose 1)

- HU 3400 Topics in Diversity Studies (3 cr)
- HU 3401 Gender and Culture (3 cr)
- HU 3410 Introduction to Diversity Studies in the United States (3 cr)
- HU 3701 Philosophy of Technology (3 cr)
- PSY4340 Culture & Cognition (3 cr)
- PSY3720 Social Psychology (3 cr)
- SS 2100 Introduction to Cultural Anthropology (3 cr)
- SS 2510 Gender and the Past (3 cr)
- SS 2700 Introduction to Sociology (3 cr)
- SS 3105 Native American and Indigenous Communities (3 cr)
- SS 3270 Archaeology of the African Diaspora (3 cr)
- SS 3750 Social Inequality (3 cr)

Usability Elective: 1 course, 3 credits (choose 1)

- HU 4628 Usability Evaluation and User Experience Design (3 cr)
- PSY 4080 Usability Assessment (3 cr)

Visual Design Elective: 1 course, 3 credits (choose 1)

- ART 1100 Drawing I (3 cr)
- ART 1110 Art + Design Studio (3 cr)
- HU 2633 Fundamentals of Digital Imaging (3 cr)
- HU 2645 Graphic and Information Design (3 cr)

Free Electives: 10 - 14 credits

Students may select any courses to meet this requirement.

Concentration Requirement: 20-24 credits

Students must complete all requirements in one of four concentration areas: Systems Thinking and Design, Human-Computer Interface Design, Innovation and Human-Centered Design, or Applications. All concentration areas include one mathematics course, at least one programming-intensive course drawn from the restricted STEM list, and a minimum of 6 credits of upper-division courses. The concentrations are intentionally aligned with existing minors in disciplines that contribute heavily to the interdisciplinary field of human factors, therefore encouraging and enabling students to pursue a minor without increasing their time at Michigan Tech. (Note that completing a concentration does not, alone, complete a minor; students who choose to pursue an aligned minor may need to use some free electives or general education courses to do so.) The Applications Concentration is modeled after the BS in Computer Science Applications Concentration which allows students to design and name their own focus area with the permission of the CLS undergraduate program committee.

Concentration Area Option 1: Systems Thinking and Design (20-23 cr)

One of the following (4-6 cr) **[STEM]:**

- MA 1030 College Algebra I AND MA 1031 College Algebra II with Trigonometry (6)
- MA 1032 Precalculus (4)
- MA 1120 Single-Variable Calculus with Integrated Precalculus I (4)
- MA 1160 Calculus with Technology I (4)
- MA 1161 Calculus Plus with Technology I (5)

One of the following (2-3) **[STEM, restricted]**:

- ENG 1101 Engineering Analysis and Problem Solving (3) (requires MA 1160 co-req)
- ENG 1001 Engineering Problem Solving (2) (requires MA 1031 co-req)

- CS 1121 Introduction to Programming I (requires MA 1031 co-req)
- CS 1131 Accelerated Introduction to Programming (requires MA 1031 pre-req)
- MIS 2100 Introduction to Business Programming (no prerequisites)

All of the following (8 cr):

- ENG 1505 Introduction to Systems Engineering (1)
- ENG 2505 Introduction to Low Fidelity Systems Modeling (3)
- ENG 3505 Low Fidelity Systems Modeling (1)
- ENG 4505 Systems Analysis, Modeling, and Design (3)

One of the following (3 cr):

- ENG 4300/OSM 4300 Project Management (3)
- ENG 4510 Sustainable Futures I (3 cr)

Three credits from the following list (3 cr):

- ENT 3953 Ignite: Ideate, Innovate, Create! (1 cr)
- ENT 3958 Ethics in Engineering Design and Implementation (1 cr)
- ENT 3963 Deliver: Explore, Develop, Execute! (1 cr)
- ENT 3983 The Culture of Continuous Improvement (1 cr)
- HON 3300 Innovation through Human Centered Design (3 cr)

Concentration Area Option 2: Human-Computer Interface Design (22 cr)

One of the following (4 cr) **[STEM]:**

- MA 1135 Calculus for Life Sciences (4 cr)
- MA 1160 Calculus with Technology I (4 cr)
- MA 1161 Calculus Plus with Technology 1 (4 cr)

All of the following (18 cr)

- CS 1121 Introduction to Programming I* (3 cr) **[STEM, restricted]**
- CS 1122 Introduction to Programming II* (3 cr)
- CS 2311 Discrete Structures (Requires MA1135|MA1160|MA1161) (3 cr)
- CS 2321 Data Structures (3 cr)
- CS 3141 Team Software Project (3 cr)
- CS 4760 User Interface and Design Implementation (3 cr)

*May be substituted with CS 1131 (5 cr)

Concentration Area Option 3: Innovation and Human-Centered Design (21-24 cr)

One of the following (4-6 cr) **[STEM]:**

- MA 1030 College Algebra I AND MA 1031 College Algebra II with Trigonometry (6 cr)
- MA 1032 Precalculus (4 cr)
- MA 1120 Single-Variable Calculus with Integrated Precalculus I (4 cr)
- MA 1135 Calculus for Life Sciences (4 cr)
- MA 1160 Calculus with Technology I (4 cr)

Choose a pair of courses (6 cr):

- MIS 2100 Introduction to Business Programming (3 cr) **[STEM, restricted]** and
- MIS 2200 Web Programming (3 cr)

OR

- CS 1121 Introduction to Programming I (3 cr) **[STEM, restricted]** and
- CS 1122 Introduction to Programming II (3 cr)

Select three courses from the following (9 cr):

- MKT 3000 Principles of Marketing (3 cr)
- MKT 3200 Consumer Behavior and Culture (3 cr)
- MGT 4600 Management of Technology and Innovation (3 cr)
- ENG 4300/OSM 4300 Project Management (3 cr)

Choose one of the following (2-3 cr)

- HON 3300 Innovation through Human Centered Design (3 cr)

OR

- ENT 3953 Ignite: Ideate, Innovate, Create! (1 cr) AND
- ENT 3963 Deliver: Explore, Develop, Execute! (1 cr)

Concentration Area Option 4: Application Area (21-24 cr)

Students may identify and name their own concentration area. The concentration must include at least 21 credits, with one mathematics course from the STEM list, one programming-intensive course drawn from the restricted-STEM list, and a minimum of 6-credits of upper-division courses. The application area must have a theme related to human factors and be approved by the CLS undergraduate program committee.

General Education Requirements: 39 credits

Students will complete 15 credits of STEM, including 4 credits from the university approved Mathematics list and a minimum of 7 credits from the approved Science list, including one lab science course. STEM credits are embedded within the major and concentration requirements and are noted with the label [STEM] in the sections above.

Students will take an additional 24 credits (including 6 credits of upper division courses) of core and HASS courses, distributed as follows:

- UN 1015 Composition (3 cr)
- UN 1025 Global Issues (3 cr) or 3000-level or higher Modern Language Course (3 cr)
- Creative and Critical Thinking (3 cr from an approved list)
- Social Responsibility and Ethical Reasoning (3 cr from an approved list)
- Communication and Composition (3 cr from an approved list)
- Humanities and Fine Arts (3 cr from an approved list)
- Social and Behavioral Sciences (EC/PSY/SS) (3 cr from an approved list)
- HASS Elective (3 cr from an approved list)

Culminating Experience: 7 credits

Students will complete a culminating experience through the Enterprise Program. During their final academic year, students will also complete a 1-credit course during which they will reflect on their experiences on the team project and prepare a digital portfolio to showcase their skills and preparation for the profession. With permission of the CLS undergraduate program committee, students may replace the 6 credits of Enterprise Project Work with another project-based experience with a significant human factors component.

- ENT 3950 Enterprise Project Work III (1 cr)
- ENT 3960 Enterprise Project Work IV (1 cr)
- ENT 4900 Senior Enterprise Project Work V Non-Capstone (2 cr)
- ENT 4910 Senior Enterprise Project Work VI Non-Capstone (2 cr)
- HF 4500 Culminating Experience Reflection (1)

10. New Course Descriptions:

Three new classes are proposed. The course proposal sheets are included in the appendix.

a. HF 1000: Introduction to the Human Factors Major (1 cr)

Human Factors majors examine the field of human factors and major degree requirements resulting in an undergraduate plan of study focused on graduate school admission or career preparation. Students will be introduced to department research and other opportunities.

b. HF 2000: Introduction to Engineering Psychology and Human Performance (3 cr)

This class will examine the capabilities and limitations of human perception and cognition and the application of theories and principles of human performance to design.

c. HF 4500 Culminating Experience Reflection (1 cr)

Students will reflect upon their experiences within a multidisciplinary team project, discussing the challenges that arise and strategies for successfully collaborating within multidisciplinary teams and successfully contributing to a human-centered design process. Students will prepare a digital portfolio to showcase their HF skills and preparation for the profession.

11. Model schedules:

Sample schedules for each concentration are listed below. Each includes 120 credits of coursework; 3 credits of co-curricular activities must be added to schedule. Courses with asterisks are offered every other year, so the order of these classes may be switched based on availability.

Concentration 1: Systems Thinking and Design

Year 1: Fall (14 credits)
- HF 1000 Introduction to the Human Factors Major (1)
- HF 2000 Introduction to Engineering Psychology and Human Performance (3)
- UN 1015 Composition (3)
- Core: Social Responsibility and Ethical Reasoning (3)
- MA 1160; depends on placement (4)

Year 1: Spring (16 credits)
- PSY 2720 Statistics for Behavioral Sciences (4)
- PSY 2800 Critical Thinking for Social and Behavioral Sciences (3)
- UN1025 Global Issues (3)
- ENG 1101 Engineering Analysis and Problem Solving (or CS1121, MIS2100) (3)
- Core: Social and Behavioral Sciences (3)

Year 2: Fall (14 credits)
- PSY 3000 Research Methods & Statistics I (3)
- PSY 3700 Industrial Org. Psychology *** (3)
- HF Elective: Diversity (see choices) (3)
- BL 2010/2011: Anatomy and Physiology (4)
- ENG 1505 Introduction to Systems Engineering (1)

Year 2: Spring (15 credits)
- PSY 3001 Research Methods & Statistics II (3)
- PSY 3800 Environmental Psychology*** (3)
- HF Elective: Visual Design (see choices) (3)
- Core: Critical and Creative Thinking (3)
- ENG 2505 Introduction to Low Fidelity Systems Modeling (3)

Year 3: Fall (15 credits)
- PSY 3850 Human Factors Psychology (3)
- PSY 4010 Cognitive Psychology (3)

- PSY 4015 Cognitive Task Analysis*** (3)
- Core: Communication and Composition (3)
- ENG 3505 Low Fidelity Systems Modeling (1)
- ENT 3950 Enterprise Project Work III (1)
- ENT 3953 - Ignite: Ideate, Innovate, Create! (1)

Year 3: Spring (15 credits)
- PSY 4160 Sensation and Perception*** (3)
- PSY 4500 Seminar (1)
- HF Elective: Usability (e.g., HU 4628, see choices) (3)
- HASS: Humanities and Fine Arts (3)
- ENT 3960 Enterprise Project Work IV (1)
- ENT 3963 - Deliver: Explore, Develop, Execute! (1)
- Free Elective (3)

Year 4: Fall (15 credits)
- HF 4500 Culminating Experience Reflection (1)
- KIP 4250 Ergonomics (3)
- ENG 4505 Systems Analysis, Modeling, and Design (3)
- ENT 4900 Senior Enterprise Project Work V Non-Capstone (2)
- HASS: Elective (3)
- Free Elective (3)

Year 4: Spring (16 credits)
- HF Elective: Cognitive (see choices)*** (3)
- ENT 4910 Senior Enterprise Project Work VI Non-Capstone (2)
- ENT 3958 Ethics in Engineering Design and Implementation (1)
- MGT 4600 Management of Technology and Innovation (or ENG 4300) (3)
- Free Elective (3)
- Free Elective (4)

Concentration 2: Human-Computer Interface Design

Year 1: Fall (14 credits)
- HF 1000 Introduction to the Human Factors Major (1)
- HF 2000 Introduction to Engineering Psychology and Human Performance (3)
- UN 1015 Composition (3)
- Core: Social Responsibility and Ethical Reasoning (3)
- MA 1135; depends on placement (4)

Year 1: Spring (16 credits)
- PSY 2720 Statistics for Behavioral Sciences (4)
- PSY 2800 Critical Thinking for Social and Behavioral Sciences (3)
- UN1025 Global Issues (3)
- Core: Social and Behavioral Sciences (3)
- Free Elective (3)

Year 2: Fall (16 credits)
- PSY 3000 Research Methods & Statistics I (3)
- PSY 3700 Industrial Org. Psychology *** (3)
- HF Elective: Diversity (see choices) (3)
- BL 2010/2011: Anatomy and Physiology (4)
- CS 1121 Introduction to Programming I (3)

Year 2: Spring (15 credits)
- PSY 3001 Research Methods & Statistics II (3)
- PSY 3800 Environmental Psychology*** (3)
- HF Elective: Visual Design (see choices) (3)
- Core: Critical and Creative Thinking (3)
- CS 1122 Introduction to Programming II (3)

Year 3: Fall (16 credits)
- PSY 3850 Human Factors Psychology (3)
- PSY 4010 Cognitive Psychology (3)
- PSY 4015 Cognitive Task Analysis*** (3)
- Core: Communication and Composition (3)
- ENT 3950 Enterprise Project Work III (1)
- CS 2311 Discrete Structures (3)

Year 3: Spring (14 credits)
- PSY 4160 Sensation and Perception*** (3)
- PSY 4500 Seminar (1)
- HF Elective: Usability (e.g., HU 4628, see choices) (3)
- HASS: Humanities and Fine Arts (3)
- ENT 3960 Enterprise Project Work IV (1)
- CS 2321 Data Structures (3)

Year 4: Fall (15 credits)
- HF 4500 Culminating Experience Reflection (1)
- KIP 4250 Ergonomics (3)
- CS 3141 Team Project (3)
- ENT 4900 Senior Enterprise Project Work V Non-Capstone (2)
- HASS: Elective (3)
- Free Elective (3)

Year 4: Spring (14 credits)
- HF Elective: Cognitive (see choices)*** (3)
- ENT 4910 Senior Enterprise Project Work VI Non-Capstone (2)
- CS 4760 User Interface and Design Implementation (3)
- Free Elective (3)
- Free Elective (3)

Concentration 3: Innovation and Human-Centered Design

Year 1: Fall (14 credits)
- HF 1000 Introduction to the Human Factors Major (1)
- HF 2000 Introduction to Engineering Psychology and Human Performance (3)
- UN 1015 Composition (3)
- Core: Social Responsibility and Ethical Reasoning (3)
- MA 1135; depends on placement (4)

Year 1: Spring (16 credits)
- PSY 2720 Statistics for Behavioral Sciences (4)
- PSY 2800 Critical Thinking for Social and Behavioral Sciences (3)
- UN1025 Global Issues (3)
- Core: Social and Behavioral Sciences (3)
- MIS 2100 Introduction to Business Programming (3)

Year 2: Fall (16 credits)
- PSY 3000 Research Methods & Statistics I (3)
- PSY 3700 Industrial Org. Psychology *** (3)
- HF Elective: Diversity (see choices) (3)
- BL 2010/2011: Anatomy and Physiology (4)
- MIS 2200 Web Programming (3)

Year 2: Spring (15 credits)
- PSY 3001 Research Methods & Statistics II (3)
- PSY 3800 Environmental Psychology*** (3)
- HF Elective: Visual Design (see choices) (3)
- Core: Critical and Creative Thinking (3)
- MKT 3000 Principles of Marketing (3)

Year 3: Fall (16 credits)
- PSY 3850 Human Factors Psychology (3)
- PSY 4010 Cognitive Psychology (3)
- PSY 4015 Cognitive Task Analysis*** (3)
- Core: Communication and Composition (3)
- ENT 3950 Enterprise Project Work III (1)
- MKT 3200 Consumer Behavior and Culture

Year 3: Spring (14 credits)
- PSY 4160 Sensation and Perception*** (3)
- PSY 4500 Seminar (1)
- HF Elective: Usability (e.g., HU 4628, see choices) (3)
- HASS: Humanities and Fine Arts (3)
- ENT 3960 Enterprise Project Work IV (1)
- HON 3300 Innovation through Human Centered Design (3)

Year 4: Fall (15 credits)

- HF 4500 Culminating Experience Reflection (1)
- KIP 4250 Ergonomics (3)
- CS 3141 Team Project (3)
- ENT 4900 Senior Enterprise Project Work V Non-Capstone (2)
- HASS: Elective (3)
- Free Elective (3)

Year 4: Spring (14 credits)
- HF Elective: Cognitive (see choices)*** (3)
- ENT 4910 Senior Enterprise Project Work VI Non-Capstone (2)
- MGT 4600 Management of Technology and Innovation (or ENG 4300) (3)
- Free Elective (3)
- Free Elective (3)

Concentration 4: Application Area

Year 1: Fall (14 credits)
- HF 1000 Introduction to the Human Factors Major (1)
- HF 2000 Introduction to Engineering Psychology and Human Performance (3)
- UN 1015 Composition (3)
- Core: Social Responsibility and Ethical Reasoning (3)
- MA 1135; depends on placement (4)

Year 1: Spring (16 credits)
- PSY 2720 Statistics for Behavioral Sciences (4)
- PSY 2800 Critical Thinking for Social and Behavioral Sciences (3)
- UN1025 Global Issues (3)
- Core: Social and Behavioral Sciences (3)
- Free Elective (3)

Year 2: Fall (16 credits)
- PSY 3000 Research Methods & Statistics I (3)
- PSY 3700 Industrial Org. Psychology *** (3)
- HF Elective: Diversity (see choices) (3)
- BL 2010/2011: Anatomy and Physiology (4)
- CS 1121 Introduction to Programming I or other approved class (3)

Year 2: Spring (15 credits)
- PSY 3001 Research Methods & Statistics II (3)
- PSY 3800 Environmental Psychology*** (3)
- HF Elective: Visual Design (see choices) (3)
- Core: Critical and Creative Thinking (3)
- Concentration Class (3)

Year 3: Fall (16 credits)
- PSY 3850 Human Factors Psychology (3)

- PSY 4010 Cognitive Psychology (3)
- PSY 4015 Cognitive Task Analysis*** (3)
- Core: Communication and Composition (3)
- ENT 3950 Enterprise Project Work III (1)
- Concentration Class (3)

Year 3: Spring (14 credits)
- PSY 4160 Sensation and Perception*** (3)
- PSY 4500 Seminar (1)
- HF Elective: Usability (e.g., HU 4628, see choices) (3)
- HASS: Humanities and Fine Arts (3)
- ENT 3960 Enterprise Project Work IV (1)
- Concentration Class (3)

Year 4: Fall (15 credits)
- HF 4500 Culminating Experience Reflection (1)
- KIP 4250 Ergonomics (3)
- Concentration Class (3)
- ENT 4900 Senior Enterprise Project Work V Non-Capstone (2)
- HASS: Elective (3)
- Free Elective (3)

Year 4: Spring (14 credits)
- HF Elective: Cognitive (see choices)*** (3)
- ENT 4910 Senior Enterprise Project Work VI Non-Capstone (2)
- Concentration Class (3)
- Free Elective (3)
- Free Elective (3)

12. **Library and Other Learning Resources Needed:** None

13. **Descriptions of Available/Needed Equipment:** As the Student Laptop Requirement is now universal for Michigan Tech Undergraduate students, there is no need for additional computing labs or equipment. The initial target enrollment for the program is 40 students total, roughly 10 students in each of: freshman year, sophomore year, junior year, and senior year. For the target population, under standard conditions (not COVID conditions), the classrooms currently used for our courses (including two in Meese) will suffice for nearly all of our courses. Two or three courses may need to be moved to accommodate larger capacities. As the program grows over the 40 student level, suitable classrooms with movable furniture (to facilitate cooperative learning) would include: the Jackson Active Learning Classroom, Dillman 101, Dillman 204, Dillman 208, Fisher 325, MEEM 402, MEEM 405, and other active learning spaces on campus. Software needed to support students is available from IT downloads (MTU). There are no other equipment needs that are currently foreseen.

14. **Program costs (years 1-3):** The only anticipated program costs for the first three years are for recruiting (specifically, advertising the new program to high school teachers and

counselors, and directly to students). We expect to spend about $1000-$2000 per year buying names and for mailings.

15. Accreditation Requirements: Not applicable

16. Planned Implementation Date: Fall 2021

Additional Information

1. Policies, regulations and rules: The department chair of Cognitive and Learning Sciences will be responsible for administering this program in accordance with university policy.

2. Scheduling plans: Regular

3. Space: No additional space is required

4. Faculty resumes: Available online.

Financial Implications

1. Relation to University Strategic Plan

   The proposed HF major is well aligned with the goals laid out in Michigan Tech's strategic plan (https://www.mtu.edu/stratplan/):

   Under "Education/Student Learning":

   a. *Promote mutual appreciation of, and collaborative opportunities across, academic disciplines.*

   Human factors is an interdisciplinary field, with academic roots in psychology, engineering, and computer science. Accordingly, the HF major is intentionally designed to provide students with foundational courses in several disciplines and to inculcate students with an understanding and appreciation of the perspectives and approaches that different disciplines bring to address complicated socio-technical problems. The HF major will provide students with opportunities to collaborate with students and faculty across colleges through technical concentrations that leverage existing coursework in College of Engineering, College of Computing, and College of Business and through a culminating experience through the Enterprise program.

   b. *Continually assess, review, and improve programs and develop new offerings in emerging disciplinary and interdisciplinary areas.*

   The proposed major leverages and integrates existing strengths within the CSA, COE, COB, and CoCo to provide an exceptional foundation in the convergent discipline of human factors. As part of the 21st Century Tech Forward Initiative, an interdisciplinary task force (composed of individuals from CLS, Humanities, CS, MIS, and Systems Engineering) culled the Michigan Tech course catalog to identify HF-related courses and to group them into related themes. The proposed HF program is the product of that work.

Under "Education/Transformative Education"

c. *Promote social and civic responsibility as well as ethical conduct.*

Many aspects of the proposed HF major require students to actively reflect on issues of social and civic responsibility and ethical conduct. For example, a *human-centered design* approach (one that includes the human perspective throughout the design process) is foundational to the field of human factors and to the major. This approach can serve as a framework for exploring social and civic responsibility in design and for considering ethical dilemmas. The program also requires a course to build cultural competency.

Under "Educational Program"

d. *Develop and enhance pathways to completion of undergraduate and graduate programs.*

The proposed HF curriculum includes a choice of concentration areas, enabling students to select one of three curated pathways that focus on a subfield or specialization within HF. These concentrations are aligned with the requirements of existing HF-related minors, making the pursuit of these minors accessible within a four-year course of study. These minors include Business, Computer Science, Enterprise, and Systems Engineering. Students may also work with an advisor to propose their own concentration, similarly to what is done in other academic programs on campus (e.g., Computer Science - applications concentration).

The HF major also provides a pathway into the accelerated MS program in Applied Cognitive Science and Human Factors. HF students may also be interested in (and prepared for) the accelerated master's programs in Business Administration, Computer Science, and Data Science.

2. Consistency with the university's resource allocation criterion

The university has set a goal of 15 majors and 5 graduate students per FTE tenure track faculty. The proposed program will leverage existing resources and expertise within the Department of Cognitive and Learning Sciences and across campus, allowing us to move closer to these benchmarks without requiring additional resources. Based on current enrollment numbers, CLS currently has approximately 7 majors per FTE T/TT faculty and 3.5 graduate students per FTE T/TT faculty.

In response to an interdisciplinary call for expertise in the area of UI/UX and in support of expected program growth in human factors and related areas, the Provost approved a search for a Professor of Practice in UI/UX. This search is currently underway. This hire will support course offering in usability and UI/UX to support both this new major and existing programs at Michigan Tech.

3. Impact on University Enrollment

a. *Projected number of students in the program.*

Our five-year goal is a steady-state enrollment of 40 students in the Human Factors major, with an overall 5-year enrollment goal of 120 undergraduate students within the department of Cognitive and Learning Sciences.

b. *Source of new students; in particular, will the students be drawn from existing programs, or will they be students who would otherwise not have come to MTU?*

We intend to enroll students who would not otherwise have come to Michigan Tech. We are particularly interested in attracting students with a breadth of interests and skill sets, who have the technical skills typically associated with engineering and computer science, but an interest in working in human-centered domains. The HF curriculum is well differentiated from our undergraduate psychology program, so we do not anticipate that the programs will compete with one another. Like other undergraduate programs in the College of Sciences and Arts, we expect that the HF major will also serve as an important university retention tool, providing an internal transfer option to students who might otherwise leave the university.

c. *What is the likely correlation between demand for the new program and existing enrollment patterns at MTU?*

In the short term, the HF undergraduate major will gradually become more known among existing students, and by word of mouth and intentional means, to prospective students. As a new program, we expect it will grow more quickly than university-wide numbers because the HF program will attract students who do not see a similar program within Michigan Tech currently, or at other universities in the state or region.

In the medium term, we anticipate that a track record of job placement will also help drive enrollment. Graduates of the ACSHF graduate program have been working in a variety of industry positions for the past 5-8 years, and we anticipate these networks will continue to grow and help provide additional internship and job placement opportunities for graduates of the undergraduate program. The response to B.S. graduates developing a track record of solid employment will then place the HF undergraduate program in a position to outpace university average growth.

d. *What is the current enrollment in the unit?*

The Department of Cognitive and Learning Sciences has a total of 52 undergraduate students in psychology, 26 graduate students in Applied Cognitive Science and Human Factors, and 54 psychology minors.

4. Impact on resources required by department in which the program is housed

We anticipate needing additional resources after the total number of undergraduate students (psychology and human factors) exceeds 100 in order to add sections to key courses required for the majors, while sustaining our minor and current level of contribution to

general education courses. Resources may include a faculty line or additional GTA support. As our faculty is currently fairly small and largely research active, another faculty line would ensure that our department can continue offering a full spectrum of undergraduate and graduate courses when faculty have course buyouts, sabbaticals, or are on parental leave.

No new laboratories are required.

Additional advising time is estimated at 40 hours per year. The Department of Cognitive and Learning Sciences assigns faculty members as advisors.

Additional assessment time is estimated at 20 hours per year, initially, as assessment is implemented and then approximately 10 hours per year after that.

5. Impact on resources required by other units within the university

   Human factors is an interdisciplinary field. Accordingly, we have proposed a curriculum that leverages courses from across campus for our concentrations, especially from College of Engineering, College of Computing, and College of Business. Assuming approximately 10 students in the major per year and fairly equal popularity among the concentrations, we expect this will increase demand on those courses by 3-4 students per year. For the most part, these courses are also ones associated with minors in those units.

   The proposed major also requires courses that are drawn from Visual and Performing Arts, Humanities, and Social Sciences. For our elective choice points in Cultural Competency, Usability, and Visual Design, we have provided a selection of acceptable options to ensure that no one class will be overly stressed by an influx of students.

6. Assessment of the ability to obtain the necessary resources assuming requested funds are obtained.

   If an additional faculty line is extended to the Department of Cognitive and Learning Sciences, we do not expect any difficulty filling the position. All recent searches have been successful.

7. Past Proposals

   In 2009, the Department of Cognitive and Learning Sciences proposed a new graduate program in Applied Cognitive Science and Human Factors. The proposal projected enrollment of 15 students within 7 years. The program has exceeded expectations and is continuing to grow, with current enrollment of 26 students. In recent years, we have added an accelerated track to the coursework MS program for Michigan Tech students, so we anticipate that the proposed HF major will also contribute toward sustained growth in our graduate enrollment.

8. Departmental Budget Contribution

   a. *What is the department's total general fund budget?*

In 2019-2020, the general fund base budget was $1,265,783.

b. *How much tuition does the department generate? How much tuition does the department generate? This information should be provided for both the credit hours taught by the department and the number of credit hours taken by the department's majors.*

In FY 2018-19 (most recent available data), the Department of Cognitive and Learning Sciences generated $2,571,097 based on credit hours taught by the department and $1,090,818 based on the number of credit hours taken by the department's majors.

APPENDIX

— Course Add Proposal —
PLEASE COMPLETE THIS FORM IN RED

A guide for completing this form is located at http://www.mtu.edu/registrar/faculty-staff/course-proposal/

1) Course Information

Is this a **half-semester course proposal?** ☐ Yes ☒ No

> **NOTE**: All half-semester courses must follow rules set in Faculty Senate Proposal 4-00. See Senate website for details: http://www.sas.it.mtu.edu/usenate/propose/03/10-03.htm

Course Prefix/Number *(i.e. MEEM 2110)*: HF 1000

Course Title *(abbreviated; used on transcript - Up to **30** characters including spaces)*

Introduction to the HF Major

Alternative Title for Catalog *(Up to **100** characters including spaces)*

Introduction to the Human Factors Major

2) Credits

Number of credits assigned to this course __1__

OR

Range of credits if **variable** ☐ to ☐ *(Number of credits to be taken in a given semester)*

3) Schedule

Contact Hours per Week *(Lec & Rec: 1 credit =1 contact hour; Lab: 1 credit =1-3 contact hours. (i.e. a 3-credit course may be 2 contact hours of lecture or recitation and up to 3 contact hours of lab OR 1 contact hour of lecture or recitation and up to 6 contact hours of lab)*

0	1	☐
Lecture	Recitation	Lab

OR

Research Course? ☐ Yes ☒ No

OR

Special Topics Course? ☐ Yes ☒ No

4) Additional Credits

May students receive **additional credits** by taking and passing this course <u>more than once</u>?

☒ No

☐ Yes, for a maximum of _____ credits. *(Must be a multiple of the course credits, i.e. Research or Special Topics)*

☐ Yes, for an unlimited number of credits. *(i.e. Music, Varsity sports, etc.)*

5) Pass/Fail

Will this course be offered as a **pass/fail option ONLY**? *(grade of S or E)* ☐ Yes 🔴 No

6) Cross/Dual Listed Course

Cross Listed: Is there an identical course offered in a different subject? ☐ Yes ☐ No

    If yes, what is the other subject and course number? _____

Dual Listed: Is there a course offered at a different level? ☐ Yes ☐ No

    If yes, what is the other course number? _____

7) Equivalent Course: Does this course replace a dropped course with no change in course content for degree requirements, prerequisites, and repeating purposes? ☐ Yes 🔴 No

    If yes, what is the subject and course number of the dropped course? _____

8) Corequisites and Prerequisites

Corequisites are courses that are **REQUIRED to be taken at the SAME TIME** as this course (courses MUST be offered during the same term):

> Required corequisite course(s):
>
> _____
>
> _____

Prerequisites are courses that are **REQUIRED to be taken PRIOR** to enrollment in this course.
Select appropriate box and use parentheses where needed.

> Required prerequisite course(s):
>
> 1 _____
>
> ☐ And ☐ Or 2 _____
>
> ☐ And ☐ Or 3 _____
>
> ☐ And ☐ Or 4 _____
>
> ☐ And ☐ Or 5 _____
>
> ☐ And ☐ Or 6 _____

A **concurrent prerequisite** is a defined prerequisite course (from list above) that **MAY** be taken **EITHER** simultaneously in the same semester **OR** in a prior semester. Indicate below applicable courses.

> Concurrent prerequisite course(s):
>
> _____
>
> _____
>
> _____

9) Catalog Course Description

The traditional catalog style description for a course is limited to **350 characters including spaces**. If course is proposed as a half-semester course, please include that information in the description. **Please refer to the Course Proposal Guide for examples and suggestions on developing a course description.**

Human Factors majors examine the field of human factors and major degree requirements resulting in an undergraduate plan of study focused on graduate school admission or career preparation. Students will be introduced to department research and other opportunities.

10) Registration Restrictions

- If permission is **always required** for registration purposes (a student cannot enter the course without department or instructor signature)**,** please select the appropriate permission.

   Do not select unless EVERY STUDENT must get "SIGNED INTO" the class.

   ☐ Department **OR** ☐ Instructor

- Students who register for this course may be restricted by their **College/School OR** their **Major**. Please indicate if any college or major restrictions should be applied to this course. If there are no restrictions please indicate in the check box provided.

☑ **No College/School Restrictions**   ☐ **No Major Restrictions**

Colleges/Schools who MAY NOT enroll (EXCLUDE)
_____
-OR-
Colleges/Schools who MAY enroll (INCLUDE)
_____

Majors that MAY NOT enroll (EXCLUDE)
_____
-OR-
Majors that MAY enroll (INCLUDE)
Human Factors _____

-- Restrictions continued on next page --

- A restriction may also be placed on **Class Standing** (freshman, sophomore, junior, senior, graduate). Please indicate if any class restrictions should be applied to this course. If there are no restrictions please indicate in the check box provided.

■ **No Class Restrictions**

Class of students who MAY NOT enroll (EXCLUDE)
_____
-OR-
Class of students who MAY enroll (INCLUDE)
_____

---

11) Semester(s) Offered

■ Fall   ☐ Spring   ☐ Summer   *(Check all that apply)*

OR   ☐ On Demand

If offered in a specific semester, will the course be offered only in alternate years?   ☐ Yes   ☐ No

If yes, what will be the starting academic year? *(i.e. 2014-15 or 2015-16)* _____

---

12) General Education

Is this course being proposed for General Education?   ☐ Yes   ☐ No

Proposal forms are available at: http://www.mtu.edu/registrar/faculty-staff/course-proposal/**.**

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13) Course Computing Lab and Expendables Fees

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---

14) Course Learning Objectives (Required)

Upon successful completion of this course, students will be able to:

Identify career paths in human factors, including concentration ares that interest you and you want to take classes in.
Describe research interests of faculty in the Cognitive and Learning Sciences Department, know how to contact faculty members and how to get involved in research.
Communicate and network with human factors students and other students in human factors-related organizations at Michigan Tech.
Describe your personal goals and develop an individual development plan to help you work towards them.

15) Degree Programs which this course will affect

List the degrees, minors, and certificates in which this course will be required or used as an elective: ***

> Degree Program(s):
>
> _Human Factors_____
>
> _____
>
> _____
>
> _____
>
> _____

*** Be sure to adjust the appropriate degree audits in sections 7 and 8 in your department's binder.

16) **Course Rationale** *(Required)*

> This is a first year course designed to aid in student advising, help build a community among the students and faculty, and support retention at Michigan Tech.

17) Faculty Contact

Faculty proposing this course *(please print)*: Name _Kelly Steelman_

Email _steelman@mtu.edu_____

DID YOU USE RED INK TO COMPLETE THIS FORM?

IF NOT, PLEASE HIGHLIGHT YOUR ANSWERS SO NOTHING IS MISSED IN PROCESSING.

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Course Prefix/Number *(i.e. MEEM 2110)*: HF 1000

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Alternative Title for Catalog *(Up to **100** characters including spaces)*

Introduction to the Human Factors Major

2) Credits

Number of credits assigned to this course __1__

OR

Range of credits if **variable** ☐ to ☐ *(Number of credits to be taken in a given semester)*

3) Schedule

Contact Hours per Week *(Lec & Rec: 1 credit =1 contact hour; Lab: 1 credit =1-3 contact hours. (i.e. a 3-credit course may be 2 contact hours of lecture or recitation and up to 3 contact hours of lab OR 1 contact hour of lecture or recitation and up to 6 contact hours of lab)*

0	1	
Lecture	Recitation	Lab

OR

Research Course? ☐ Yes ☒ No

OR

Special Topics Course? ☐ Yes ☒ No

4) Additional Credits

May students receive **additional credits** by taking and passing this course <u>more than once</u>?

☒ No

☐ Yes, for a maximum of _____ credits. *(Must be a multiple of the course credits, i.e. Research or Special Topics)*

☐ Yes, for an unlimited number of credits. *(i.e. Music, Varsity sports, etc.)*

5) Pass/Fail

Will this course be offered as a **pass/fail option ONLY**? *(grade of S or E)* ☐ Yes ☒ No

═══

6) Cross/Dual Listed Course

Cross Listed: Is there an identical course offered in a different subject? ☐ Yes ☐ No

    If yes, what is the other subject and course number? _____

Dual Listed: Is there a course offered at a different level? ☐ Yes ☐ No

    If yes, what is the other course number? _____

═══

7) Equivalent Course: Does this course replace a dropped course with no change in course content for degree requirements, prerequisites, and repeating purposes? ☐ Yes ☒ No

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>
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_____	_____
-OR-	-OR-
Colleges/Schools who MAY enroll (INCLUDE)	Majors that MAY enroll (INCLUDE)
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11) Semester(s) Offered

☑ Fall ☐ Spring ☐ Summer *(Check all that apply)*

OR ☐ On Demand

If offered in a specific semester, will the course be offered only in alternate years? ☐ Yes ☐ No

If yes, what will be the starting academic year? *(i.e. 2014-15 or 2015-16)* _____

12) General Education

Is this course being proposed for General Education? ☐ Yes ☐ No

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>
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Email __steelman@mtu.edu_____

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Alternative Title for Catalog *(Up to 100 characters including spaces)*

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OR

Range of credits if **variable** ☐ to ☐ *(Number of credits to be taken in a given semester)*

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0	1	
Lecture	Recitation	Lab

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_____
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```
           Required prerequisite course(s):
                      1_____
☐ And  ☐ Or  2_____
☐ And  ☐ Or  3_____
☐ And  ☐ Or  4_____
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☐ And  ☐ Or  6_____
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_____

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■ **No College/School Restrictions**   ☐ **No Major Restrictions**

Colleges/Schools who MAY NOT enroll (EXCLUDE)	Majors that MAY NOT enroll (EXCLUDE)
_____	_____
-OR-	-OR-
Colleges/Schools who MAY enroll (INCLUDE)	Majors that MAY enroll (INCLUDE)
_____	Human Factors _____

-- Restrictions continued on next page --

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☑ **No Class Restrictions**

Class of students who MAY NOT enroll (EXCLUDE)

_____

-OR-

Class of students who MAY enroll (INCLUDE)

_____

11) Semester(s) Offered

☑ Fall ☐ Spring ☐ Summer *(Check all that apply)*

OR ☐ On Demand

If offered in a specific semester, will the course be offered only in alternate years? ☐ Yes ☐ No

If yes, what will be the starting academic year? *(i.e. 2014-15 or 2015-16)*_____

12) General Education

Is this course being proposed for General Education? ☐ Yes ☐ No

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Describe research interests of faculty in the Cognitive and Learning Sciences Department, know how to contact faculty members and how to get involved in research.
Communicate and network with human factors students and other students in human factors-related organizations at Michigan Tech.
Describe your personal goals and develop an individual development plan to help you work towards them.

15) Degree Programs which this course will affect

List the degrees, minors, and certificates in which this course will be required or used as an elective: ***

> Degree Program(s):
>
> _Human Factors_____
>
> _____
>
> _____
>
> _____
>
> _____

*** Be sure to adjust the appropriate degree audits in sections 7 and 8 in your department's binder.

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16) **Course Rationale** *(Required)*

> This is a first year course designed to aid in student advising, help build a community among the students and faculty, and support retention at Michigan Tech.

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17) Faculty Contact

Faculty proposing this course *(please print)*: Name **Kelly Steelman**

Email **steelman@mtu.edu**

DID YOU USE RED INK TO COMPLETE THIS FORM?

IF NOT, PLEASE HIGHLIGHT YOUR ANSWERS SO NOTHING IS MISSED IN PROCESSING.