

Interdisciplinarity@WMU- Phase One planning Template

- 1. Brief Overview:** Provide a brief overview of the proposed interdisciplinary initiative. What types of questions would the initiative ask? What types of complex problems would it seek to solve?

The proposed interdisciplinary major (BS: Human-Computer Interaction-HCI) is between the Department of Computer Science (College of Engineering and Applied Sciences) and the School of Communication (College of Arts and Sciences). HCI involves exploring the connections between computer science and social science/humanities, focusing on the relationship between people and computers. Students would be skilled in design, implementation, and evaluation of interactive computer systems. This major would explore software development contexts, programming, algorithms, artificial intelligence, social robotics, and virtual and augmented realities.

This program combines vital elements of WMU's Computer Science curriculum with those of the technological-focused humanities of the School of Communication. Students in this major would have access to the latest technology in Computer Science and the strengths of social robotics in the School of Communication. Students in this major would be in high demand for hiring in user-experience research/design, computer science, human factors in technology, HCI, and communication and information technologies (Collegefactual.com, 2021). HCI is a fast-growing field that students will need to compete in a global landscape. WMU would be one of the first universities among our peers to offer this major. This major has the strong potential to attract international students, students from diverse backgrounds, and new first-year students.

- 2. Impacted units:** What existing units, programs, and colleges would be involved in the proposed initiative? What other possibilities for collaboration across campus or in the broader community might exist now or in the future?

The proposed interdisciplinary major (BS: Human-Computer Interaction-HCI) is between the Department of Computer Science (College of Engineering and Applied Sciences) and the School of Communication (College of Arts and Sciences). This program uses existing resources to ensure efficient offerings of courses. In the future, there might be possibilities for other departments to collaborate in this program.

- 3. Impact on teaching, learning, and curricula:** Describe the anticipated impact of the proposed initiative on teaching, learning, and curricula. How might this initiative help to grow enrollment, including by reaching new audiences of learners through continuing education, dual enrollment, or professional certification? How will the proposed initiative positively impact the training of undergraduate and graduate students? How does it enhance our institutional commitment to diversity, equity, and inclusion?

The Bachelor of Science in HCI is a collaboration that combines the teaching and learning expertise of two different departments to craft a truly unique, highly marketable degree program for our students. Despite the growth and popularity of this field, there are very few undergraduate programs like this around the country. The appeal of HCI is that it bridges the gap between the technical skills that one would learn in computer science and the human-centered research that extends from the social sciences. This combination would be attractive to students who want to pursue careers that involve translation between the technical aspects of an issue, problem, or invention and the human experience. As the world becomes increasingly interconnected, organizations and governments will seek skilled leaders who can negotiate aspects of software design, thoughtfully conduct human-centered research, and clearly communicate developments to diverse groups of stakeholders. Building on the foundational teaching and research expertise that already exists at the university, a BS in HCI will position WMU as a leader in this area. Finally, this program will offer opportunities to continue to develop a diverse faculty and student body committed to meeting the needs of the world in the 21st century. This program should help address student-body diversity in computer science. Existing graduate programs in HCI draw a much more diverse student population than computer science, and it is our hope to do the same in the undergraduate program.

- 4. Impact on research and creative activity:** Describe the anticipated impact of the proposed initiative on research and creative activity. How will this initiative promote discovery and creative scholarship? How might it result in increased external funding?

While there is no direct impact on research and creative activities with the proposed major, it does bring like-minded faculty together who are examining AI. After the launch of the major, there will be many opportunities for faculty in both programs to seek external funding related to pedagogical elements of HCI education. Currently, faculty from both units are exploring possible funding opportunities related to similar research interests. Students in this program would be eligible to participate in the Communication and Social Robotics Labs exploring human-robot interaction from a social science perspective.

- 5. Efficiencies and/or cost savings:** How might the proposed initiative contribute to increased efficiencies and/or cost savings, for example by reducing administrative positions (e.g. chairs/directors), sharing staff support services and/or by sharing facilities?

The proposal introduces no new expenses upfront other than staffing the courses WMU already offers. The Bachelor of Science in HCI would also ensure current courses are filled to capacity with a diverse group of students from across campus. The teaching and administrative responsibilities would be shared across two departments and therefore not require additional overhead or staffing.

- 6. Impact on course offerings and workload:** At present, proposed initiatives will only be feasible and sustainable if they can be supported by existing resources, including instructional capacity, faculty and staff time, and facilities. Will the proposed initiative streamline existing course or program offerings? Could the initiative help create more equitable and sustainable workload for faculty, for example, by reducing the need to offer under enrolled courses, reducing the frequency of course offerings or eliminating the need to teach some courses?

The Department of Computer Science can add students to most of the courses for the major. We will have to teach one elective that is only taught occasionally and add one new course. To cover these new courses, we will use part-time faculty in our entry-level courses and move

current faculty to cover the new sections. With the SRM model, we should be able to use the revenue from the new students to cover part-time faculty.

The School of Communication can add students to existing courses without any additional hires for the proposed major. The proposed major would help support the School of Communication courses that comprise their new minor in UX/HCI started in 2020). Communication elective courses have space based on the frequency of offerings (all terms).

Both units reserve the right to ask for a faculty line in this field in four years should the major's growth warrant such a request.

7. Additional Information: What additional information would you like to provide in support of this proposal?

Courses for a BS in HCI

Required CS Courses (33 credits)

1. CS 1110 – Intro to Programming I (4)
2. CS 1120 – Intro to Programming II (4)
3. CS 1310 – Foundations of Computer Science (4)
4. CS 3310 – Data Structures (3)
5. CS 3500 – Intro to Web Technology (3)
6. CS 4430 – Database (3)
7. CS 4900 – Senior Design I: Software Engineering (3)
8. CS 4910 – Senior Design II: Implementation (3) – WES Level 3
9. CS 5400 – Design of User Interfaces (3)
10. CS 5500 – Web Frameworks (3) – (New course)

Required HCI Courses (15 credits)

1. COM 2000 – Human Communication Theory (3)
2. COM 3000 – Communication Research Methods (3)
3. COM 3710 – Human-Machine Communication (3)
4. COM 4490 – Communication Technology and Innovation (3)
5. COM 4710 – AI and Interaction (3)

Math/Science Courses (12 credits)

1. MATH 1220 (4) – WES Level 1
2. Lab Science (4) – WES Level 2
3. STAT 2600 (4)

WES Courses (27 credits)

1. IEE 1020 (3) – WES Level 1
2. COM 1000 (3) – WES Level 1
3. PHIL 3160 – (3) – WES Level 2
4. WES Level 1 – Inquiry and Engagement (3)
5. WES Level 2 – Personal Wellness (3)
6. WES Level 2 – World Language and Culture (3)
7. WES Level 2 – Artistic Theory and Practice (3)
8. WES Level 2 – Societies and Cultures (3)
9. WES Level 3 – Global Perspectives (3)

CS Electives (12 credits)

COM Electives (9 credits) Pick 3 courses (or 9 hours)

1. COM 2400 – Introduction to Media and Telecommunications (3)
2. COM 3400 – Global Media Literacy (3)
3. COM 3840 – Organizational Communication Technologies (3)
4. COM 3970 – Independent Studies in UX/HCI (Advisor and Professor approval) (3-6)
5. COM 4300 – Persuasion and Social Influence (3)
6. COM 4770 – Communication Ethics (3)

Free Electives (14 credits)

Total – 122 credits

8. Contact

Steve Carr, Computer Sciences

Chad Edwards, School of Communication