

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?

Silos and traditional department structures are limiting our growth as an institution. The initiative being proposed is a new “leveraged” entity which is an expansion, or formalization, of a 10-year relationship with WMed. This initiative would make it possible for faculty, clinicians and students to seamlessly work across entities on health care challenges that span from the “bench to the bedside” and beyond. Complex problems in areas such as computational medicine, healthcare systems, tissue engineering or medical device development could more easily be entertained and solved. This proposed structure is depicted in the figure below. As is displayed in this figure, there are programs and relationships in place, but there is room to grow. Coordination and collaboration of mutual goals across WMU and WMed can have a positive impact on future programmatic offerings, research, and costs. Additionally, there are ample philanthropic possibilities.

	Western Michigan University Department/Institute (Name)(2)		
	CEAS		WMed
Research:	X	&lt;---&gt;	X
MD/PhD:	X	&lt;---&gt;	X
MD:			X
PhD:	Biomedical Eng(2) (Existing CEAS PhD)	&lt;---	
Graduate	Computational Healthcare Systems(1,2)	&lt;---&gt; ----&gt;	Medical Engineering (MedE)(2) MD/MedE(1,2)
Undergrad.	Biomedical Engineering(1,2)	&lt;----	

1- New Proposed Programs, 2-Philanthropic Naming Opportunity, Direction of Resources &lt;--&gt;

- 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?

Currently CEAS and WMed faculty are engaged in a relationship in Medical Engineering. The scalability of MedE is very challenging for the program relies heavily on relationships with our affiliates (Borgess/Bronson). The ability to grow a large graduate student population is not possible at this time because of the extreme competition with other programs to get clinical time. This will remain a formidable challenge in the years to come and, as such, this endeavor

will remain a small program. With that said, there are some incredible benefits from this collaboration: 1) the number one challenge for students trying to acquire employment in healthcare sector is a lack of clinical understanding of the environment. Students graduating from MedE have significant hours in the clinics and are in a position to make immediate contributions by bringing new skill sets to an employment sector that has been traditionally siloed (doctors, nurses, medical technicians etc); 2) The faculty between both organizations are now very familiar/comfortable with each other, which has increased joint grant applications. We are gaining momentum and will have future success.

With the new proposed structure, we can build on our existing relationships and potentially offer Master's degrees in Computational Healthcare Systems, Medical Engineering/MD (4+1 MS/MD), and MD/PhD. As this relationship grows and blossoms, other existing programs and units from the Haworth College of Business, Product Design & Innovation, and Chemistry could be potential partners, similar to the Biological Sciences partnership in the design and planning of the proposed Biomedical Engineering program. Additionally, there may be opportunities to start businesses based on collaborative research through the Innovation Center at WMed.

- 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?

Traditional academic departments in engineering offer discipline specific BSE, MS/MSE, and PhD programs. The same can be said in medical education: MD, Residencies, and Fellowships. Education, whether academic or medical, has built walls around how and what we do. We are always quick to cite accreditation and resources (or pick another excuse) as to why we are unable to accomplish something. The truth is that the healthcare industry (patient care, devices, processes etc.) is evolving much faster than we are and they require new employees (clinicians, engineers, scientist) with enhanced skill sets. The proposed structure offers new avenues and cross-pollinated students and faculty from both entities which can create that next generation healthcare employee and innovator.

Additionally, WMed faculty were very active with CEAS and Biological Sciences in the development of the undergraduate biomedical engineering proposal currently in the Provost office. Within that proposal, there is a letter from Dr. Jenson pledging support to the BME program. The proposed BME program has several interesting value propositions: 1) WMU BME students will have meaningful interactions with clinicians/WMed during their time in the program; 2) The program is skewed heavily towards engineering such that future graduates should easily be able to sit for the professional engineering exam and pass it. This is not true with many of the existing BME programs in the US; 3) Currently CEAS faculty believe (based on other BME programs) that within 3-4 years of initiating this program we will have 350-400 students enrolled.

- 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?

Grant submissions will increase with this new structure. Currently faculty on both sides are searching for partners that exist (within a mile of each other). A common joint entity will help pair researchers on both sides, while giving students new opportunities.

- 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?

Rethinking how we deliver education may increase efficiency and decrease cost. Take, for example, a course in orthopedic biomechanics. We have a professor who does an amazing job in this area. What if, an orthopedic surgeon was to guest lecture on clinical relevance. Would this enhance the graduate students' understanding and make them more valuable? Could this concept be reversed at WMed? Yes, and to some degree this is already being done, but how could this concept be scaled and become the norm rather than the exception? Formalizing a joint entity will help accelerate pockets of collaboration already occurring.

- 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?

Existing courses are available with capacity. As the relationships grow, new course content can be added and potentially disseminated jointly.

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

This proposal is based on working smarter and not harder. We are leveraging two important and established entities to develop professionals and create technologies and systems to impact healthcare. If we can focus and identify the healthcare needs of people and society without distilling the issues down to what can be solved by one discipline, what could we accomplish? We are proposing a novel approach for growing new opportunities (for student, experiences, research) to solve the health care needs of today and tomorrow. WMU and WMed working together in this framework will lead to an important niche for our community that can only be reached through such collaboration.

**8. Contact**

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