

MIES Major Proposal
Human Centered Product Design

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I. Proposal

I decided to pursue an MIES degree because after experiencing some of the MaDE curriculum, I realized my enthusiasm lies in the field of human centered product design. Through MaDE, I was given exposure to this field of design study through classes such as DTC and DSGN 308. I was surprised by the immediate, real world impacts that these types of projects could provide to others, and I want to commit myself fully to discovering, questioning, and applying as much of this process as I can during my time at Northwestern. Although the differences between my MIES major and MaDE will not be numerous, they will lead to a more concentrated study of the human centered product design process. Focusing on the skills required to excel in this field, while still supplementing these skills with important technical experience will be extremely beneficial to my practice of human centered product design. Many thanks to Dean Burghardt, Professor Gatchell, and Professor Hoffman, who have provided valuable feedback and guidance on this proposal.

I believe that a Human Centered Product Engineering major would allow me to diverge slightly from a MaDE path – but enough to provide me with valuable skills, experiences, and opportunities that I might not be able to undergo otherwise. After my experience with the San Francisco Bay Area Immersion program, I have developed an increased interest in digital product design and development and UI/UX design. While manufacturing can be an extremely valuable skill, it may not be as prevalent in my desired fields of study as it once was. However, in no way does this mean I will neglect these skills completely. I want to maintain my passion to design and develop physical products while at the same time exploring other avenues of digital product design. One of the foundations of the MaDE curriculum – the human centered design process – encapsulates all good product design, both physical and software based. Additionally, the 3-quarter MaDE capstone experience is included in this proposal, supplementing my education with a cumulative capstone project. Human Centered Product Engineering will spotlight this principle and employ it, along with many technical-based classes, to design and develop both physical and digital products. Increasingly, I have noticed companies place an emphasis on integrating software and hardware to form a multi-faceted product that can

accomplish more than either individual component could. I am passionate about the capacity for innovation that seamless harmony between physical and digital design is able to provide.

This major, in part influenced by students before me, will specifically focus on the skills required to ideate and develop a final product. By integrating the technical skills of design engineering into the human centered design process, I hope to develop a well-rounded skillset that will enable me to approach challenges in a unique, creative way – while keeping a wholistic picture of the design process in mind. This can be achieved through a proficiency in empathy, attention to detail, and efficient group work. Key skills from this major include human-centered product design, user-focused research and testing, CAD/CAM, manufacturing, UX design, coding, and industrial design.

An asterisk (*) denotes a course I have not yet completed.

[x] denotes ABET credits

II. McCormick Basic Engineering Requirements (20 credits)

Math (4 credits)

MATH 220 – Differential Calculus of One-Variable Functions

MATH 224 – Integral Calculus of One-Variable Functions

MATH 230 – Differential Calculus of Multivariable Functions

MATH 234 – Multiple Integration and Vector Calculus

Basic Sciences (4 credits)

CHEM 151 – Accelerated General Chemistry I

CHEM 161 – Accelerated General Chemistry Lab I

PHYS 135-2 – General Physics

PHYS 136-2 – General Physics Lab

PHYS 135-3 – General Physics

PHYS 136-3 – General Physics Lab

Engineering Analysis (4 credits)

GEN ENG 205-1, 2, 3, 4 [1 Eng]

Basic Engineering (5 credits)

CIV ENV 216 – Mechanics of Materials I [1 Eng]

MECH ENG 233 – Electronics Design [1 Eng]

MAT SCI 201 – Introduction to Materials [1 Eng]

IEMS 201 – Introduction to Statistics

COMP_SCI 110 – Introduction to Computer Programming [1 Eng]

Design and Communication (3 credits)

DSGN 106-1, 2 – Design Thinking and Communication [1 Eng]

ENGLISH 106-1, 2 – Writing in Special Contexts

*COMM ST 102 – Public Speaking

III. Major Courses (18 credits)

These major courses are split up into two main cores: engineering and design. Core classes aim to provide an engineering perspective in addition to project-centered design courses. These classes will supplement each other to provide a strong basis to prepare me to apply this knowledge in the design capstone final project.

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Engineering Core (6 credits)

MECH ENG 240 – Intro to Mechanical Design and Manufacturing [1 Eng]

MECH ENG 340-1 – Manufacturing Automation [1 Eng]

*MECH ENG 340-2 – Computer Integrated Manufacturing II: CAD/CAM [1 Eng]

MAT SCI 318 – Materials Selection [1 Eng]

IEMS 313 – Foundations of Optimization [1 Eng]

*IEMS 382 – Production Planning and Scheduling [1 Eng]

Design Core (12 credits)

*DSGN 240 (.5) – Solid Modeling [0.5 Eng]

*DSGN 297 (.5) – Visual Thinking for Design [0.5 Eng]

DSGN 306 – UX Design [0.75 Eng]

DSGN 308 – Human-Centered Product Design [1 Eng]

DSGN 320 – Introduction to Industrial Design Methods [0.5 Eng]

DSGN 345 (.5) – Computer Aided Manufacturing [0.5 Eng]

DSGN 346 – Design for Fabrication [1 Eng]

*DSGN 382-1 – Service Design Studio I [1 Eng]

*DSGN 382-2 – Service Design Studio II [1 Eng]

DSGN 395 – Bay Area Service Design [0.75 Eng]

*(Capstone) DSGN 395-1 – Interdisciplinary Design Projects I [1 Eng]

*(Capstone) DSGN 395-2 – Interdisciplinary Design Projects II [1 Eng]

*(Capstone) DSGN 395-3 – Interdisciplinary Design Projects III [1 Eng]

ABET Requirement Fulfillment:

EA, DTC & Basic Engineering: 6 credits

Major Courses:

Completed by end of Spring 2020: 8.5 credits

Anticipated remaining: 7.5 credits

TOTAL: 22 credits

IV. Social Sciences/Humanities (7 credits)

These courses provide balance to my major by developing a better knowledge of how people interact with each other and their surroundings, and their motivations for doing so.

HISTORY 2WL – World History Credit (AP)

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PSYCH 215 –Psychology of Personality

ECON 202 – Introduction to Microeconomics

SOCIOL 110 – Introduction to Sociology

JOUR 377 – Data Analysis and Visualization

JOUR 390 – Media Innovation in Silicon Valley: The Good, the Bad, and the Ugly

V. Unrestricted Electives (3 credits)

These courses provide more depth to my educational experience and allow me to explore other interests.

The credit requirement is 3, as opposed to the usual 5, since my major requirement includes 2 extra credits.

PSYCH 303 – Psychopathology

PSYCH 228 – Cognitive Psychology

STATS 202 – Introduction to Statistics