

# ENGINEERING DESIGN AND INNOVATION

## Learning Outcomes

### Master of Engineering

1. **KNOW:** Understand and evaluate the unique needs of a broad set of design problems and apply in-depth design theories and methods to enhance innovation processes. Specifically, students will be able to identify appropriate design methods that will augment team capabilities and apply them appropriately given the context of the design problem or task.
2. **APPLY/CREATE:** Apply an entrepreneurial mindset and deploy entrepreneurial skills related to business finance, intellectual property, and marketing to identify and evaluate product-market fit, business viability, and market opportunities. Specifically, students will be able to apply lean startup methods to rapidly identify market opportunities and develop minimum viable products to test the viability of the market itself.
3. **PROFESSIONAL PRACTICE:** Identify relevant policies and political processes that advance or constrain the development of the project innovation and apply strategies that are needed to influence the system as it relates to an innovation. Specifically, students will be able to identify the regulatory bodies that govern the implementation of the innovation and understand the broader eco-system in which the innovation will exist, developing a critical understanding of the societal, economic, and environmental outcomes of their design decisions.
4. **THINK:** Evaluate leadership and innovation management strategies to identify innovation opportunities and illustrate the alignment with the intended project sponsor's business strategy (or potential investor's business strategy). Specifically, students will be able to articulate the strengths and weaknesses of an organization, mapping the opportunities of the innovation to the strengths of the organization and/or mitigation strategies for overcoming weaknesses.
5. **APPLY/CREATE:** Develop a solution (prototype) to an innovation challenge with market demand justification and alignment with project sponsor (or potential investor) business strategy.
6. **COMMUNICATE:** Communicate innovation results and justification to the broader community via both written and oral mediums.

### Master of Science (M.S.)

1. **KNOW:** Understand and evaluate the unique needs of a broad set of design problems and apply in-depth design theories and methods to enhance innovation processes. Specifically, students will be able to identify appropriate design methods that will augment team capabilities and apply them appropriately given the context of the design problem or task.
2. **APPLY/CREATE:** Apply an entrepreneurial mindset and deploy entrepreneurial skills related to business finance, intellectual property, and marketing to identify and evaluate product-market fit, business viability, and market opportunities. Specifically, students will be able to apply lean startup methods to rapidly identify market opportunities and develop minimum viable products to test the viability of the market itself.
3. **PROFESSIONAL PRACTICE:** Identify relevant policies and political processes that advance or constrain the development of the project innovation and apply strategies that are needed to influence the

system as it relates to an innovation. Specifically, students will be able to identify the regulatory bodies that govern the implementation of the innovation and understand the broader eco-system in which the innovation will exist, developing a critical understanding of the societal, economic, and environmental outcomes of their design decisions.

4. **THINK:** Evaluate leadership and innovation management strategies to identify innovation opportunities and illustrate the alignment with the intended project sponsor's business strategy (or potential investor's business strategy). Specifically, students will be able to articulate the strengths and weaknesses of an organization, mapping the opportunities of the innovation to the strengths of the organization and/or mitigation strategies for overcoming weaknesses.
5. **APPLY/CREATE:** Establish robust experimental methods capable of collecting data to test relevant hypotheses.
6. **COMMUNICATE:** Communicate research findings/results to the broader community via both written and oral mediums.