ENGINEERING DESIGN AND INNOVATION

https://design.northwestern.edu/engineering-design-innovation/

Degree Types: MS

The Master of Science in Engineering Design and Innovation (https://design.northwestern.edu/engineering-design-innovation) (EDI) at the Segal Design Institute is intended for recent engineering graduates seeking to lead the design of future products, services, and technologies.

Our students learn how to attack design problems with a human-centered approach to solve the needs of real people. Methods include user observation, visualization, rapid prototyping, and iteration.

EDI attracts engineers who like to create new things, are comfortable with complex problems, and care about culture and contemporary context. The coursework focuses heavily on hands-on, team-based projects. Graduates of EDI are prepared to collaborate on, and lead, development teams to create innovative and effective products and services.

Applicants should have a bachelor’s degree in engineering or a related discipline, or adequate demonstration of strong analytic skills.

Degrees Offered

- Engineering Design and Innovation MS (https://catalogs.northwestern.edu/tgs/engineering-design-innovation/engineering-design-innovation-ms)

Engineering Design and Innovation Courses

DSGN 350-0 Intellectual Property and Innovation (1 Unit)
The critical role of engineers in the invention/creative process and of technologists in wealth creation.
Prerequisite: senior standing or consent of instructor.

DSGN 375-0 Data as Art (1 Unit)
Information visualization across multiple disciplines.

DSGN 395-0 Special Topics (1 Unit)
Topics relevant to design engineering and approved by the institute.
Prerequisite: consent of instructor.

DSGN 401-1 Human-Centered Design Studio 1 (1 Unit)
This course is part one of a year-long studio course, providing a project-based introduction to the engineering design of products and processes that meet human needs. Students are given a problem area in which to innovate and will be led through the process of investigating cultural, emotional, technological and business factors, developing new concepts, creating and testing prototypes, and iterative design. Principal focus will be placed on understanding the interaction of people and products/services. Formal interaction modeling techniques will be introduced, and students will learn to prototype interactive systems. Teaching methods include lectures, labs, reading, homework assignments and projects.

DSGN 401-2 Human-Centered Design Studio 2 (1 Unit)
This course builds upon DSGN 401-1, continuing the theme of interaction design. In the first part of the course, students are given a problem area, but will be challenged to explore novel and multimodal approaches to interaction, including gestural, tactile, auditory, and others. Methods of prototyping interactive mechatronic systems will be introduced. In the second part of the course students are challenged to design an experience which grows out of the interactions between a person and a product or service. Personas, use cases and scenarios will be introduced for modeling experiences. Teaching methods include lectures, labs, reading, homework assignments and projects.

DSGN 401-3 Human-Centered Design Studio 3 (1 Unit)

DSGN 410-0 Design Research (1 Unit)
In this course, students learn the value of field research in the human-centered design process.

DSGN 420-0 Design Communication & Methods (1 Unit)
This course teaches how to translate complex information, extracted from the strategic design process into simple visual solutions. This class will help students create visualization of their ideas through using digital aids such as: Photoshop, Illustrator, Indesign, Powerpoint, Mind map, Solidworks, Keyshot, etc. Students who take this class can apply these methods to their future projects, helping them express their ideas to others, by making their ideas more visible, tangible, and real, creating a better emotional connection with their audience. But most importantly, this class will allow students to develop new creative methods in design processes and give back to the design community. Open to non-majors, with priority given to EDI students.

DSGN 450-0 Differentiation by Design (1 Unit)
Introduces students to opportunities for innovation throughout the entire new product development process. Lectures supported by case studies, readings, relevant outside experts, and real world examples.

DSGN 455-0 Design Strategy (1 Unit)
The intention of this course is to introduce the student to the power of design as a differentiator in the marketplace. The one thing we know is that change is constant. Consumer culture and values evolve, business conditions change, and new technologies develop. More often than not the influence of human centered design and strategic design thinking is leading the charge in meaningful innovation that both consumers and business find relevant. Successful organizations innovate, through deep understandings of their customer, in order to stay relevant to their constituencies and competitive in the market. And while innovation is dependant on design, strategic design requires management. This course will be highly interactive with real world examples and case studies, guest lectures from industry, class discussions and storytelling, along with hands on design thinking exercises and assignments.

DSGN 459-0 Responsible Conduct of Research Training (0 Unit)

DSGN 495-0 Special Topics in Engineering Design (1 Unit)

DSGN 497-0 Advanced Topics in Engineering Design (0.5 Unit)

DSGN 499-0 Independent Research Project (0.5-2 Units)

DSGN 519-0 Responsible Conduct of Research Training (0 Unit)