

SEGAL DESIGN INSTITUTE (DSGN)

DSGN 106-1 Design Thinking and Communication (0.5 Unit)

Integrated introduction to the engineering design process and technical communication. Approaches to unstructured and poorly defined problems; conceptual and detailed design; team structure and teamwork; project planning; written, oral, graphical, and interpersonal communications; use of software tools; discussion of societal and business issues. One lecture, two workshops, lab. Registration for both quarters required. Primarily intended for first-year students.

DSGN 106-2 Design Thinking and Communication (0.5 Unit)

Integrated introduction to the engineering design process and technical communication. Approaches to unstructured and poorly defined problems; conceptual and detailed design; team structure and teamwork; project planning; written, oral, graphical, and interpersonal communications; use of software tools; discussion of societal and business issues. One lecture, two workshops, lab. Registration for both quarters required. Primarily intended for first-year students.

DSGN 208-0 Design Thinking and Doing (1 Unit) Project-based introduction to design, structured as a hands-on studio course. Students learn methods of design innovation and work in teams, exploring ideas, prototyping solutions, and interacting with users. Intended for non-McCormick students.

DSGN 220-0 Introduction to Design Sketching (0.5 Unit) Design sketching to increase one's skills as a basic but essential form of communication. It is the medium for preliminary ideation. Basic rules and skills in a design studio setting.

DSGN 221-0 Design Sketching II (0.5 Unit) Advanced sketching techniques. Further development of skills for the design studio setting. Prerequisite: DSGN 220-0 or consent of instructor.

DSGN 240-0 Introduction to Solid Modeling: Solidworks (0.5 Unit) Solid modeling by creating three-dimensional shapes through two-dimensional sketches. Assemblies of individual parts. CAD modeling theory; modeling objects using different approaches for creating identical features. Lecture balanced with hands-on use of SolidWorks.

DSGN 245-0 Introduction to Computer Aided Design I: NX (0.5 Unit) Introduction to CAD software. Students develop solid models, detailed drawings, and product assemblies.

DSGN 246-0 Introduction to Computer Aided Design II: NX (0.5 Unit) Building more complex shapes such as splines and other developed curves, building sheets through one or more sets of curves, and applying specially shaped transitions between faces. Sequence may not be repeated for credit.

DSGN 253-0 Managing Student-run Projects (1 Unit) Program management, structure, and control for complex, multiyear efforts such as the vehicle teams, a startup business, and other student-run activities. Developing a team vision, designing strategy, and preparing a multiyear business plan using a combination of casework and a team project.

DSGN 295-0 Introductory Topics in Design (0.5-1 Unit) Topics suggested by students or faculty members and approved by the institute; taught at an intermediate level.

DSGN 297-0 Intermediate Topics in Engineering Design (0.5 Unit) Topics suggested by students and faculty and approved by the institute.

DSGN 300-0 Designing Your Life (1 Unit) The course will approach life as a series of design projects to help students craft a total life. It includes seminar-style discussions, role-playing, short writing assignments, hands-on making, guest speakers, and individual mentoring and coaching.

DSGN 305-0 Human-Centered Service Design (1 Unit) Design of new or improved services that tap deeply into people's needs for connectedness, belonging, and autonomy. Project outcomes may include organizational structures, service designs, and designed products. Prerequisite: DSGN 106-1 or DSGN 208-0.

DSGN 306-0 UX Design (1 Unit) Hands-on course covering the full range of user experience design, from screen-based experience to interaction with physical products to end-to-end environment design. Prerequisite: DSGN 106-1 or DSGN 208-0.

DSGN 308-0 Human-Centered Product Design (1 Unit) Project-based course focusing on user needs: observational methods, brainstorming, prototyping, business models, and the social and engineering concerns for product design. Prerequisite: DSGN 106-1 or 208-0

DSGN 320-0 Introduction to Industrial Design Methods (1 Unit) Process of product development from an industrial design perspective.

DSGN 321-0 Advanced Solid Modeling (0.5 Unit) This course provides advanced instruction on the use of CAD modeling using Solidworks software.

DSGN 322-0 Rendering (0.5 Unit) This course provides an introduction to Keyshot software, a photorealistic rendering package.

DSGN 345-0 Computer-Aided Manufacturing (0.5 Unit) CAM using the NX manufacturing environment to program machining operations for CNC milling. Operations, tool generation, and proper manufacturing geometries. Final project involving design and manufacture, g-code generation, and CNC, with emphasis on design for manufacturing considerations. Prerequisite: DSGN 245-0.

DSGN 346-0 Design for Fabrication: NX (1 Unit) Part design from manufacturing setup and g-code generation to proper machine operation and manufacturing. Final project involving design and CNC manufacturing of a part outside of class time. Prerequisite: DSGN 345-0.

DSGN 348-0 Rapid Prototyping (0.5-1 Unit) The landscape of additive manufacturing processes and the operation of modern RP and reverse engineering equipment. Prerequisites: DSGN 245-0, DSGN 246-0, or consent of instructor.

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 360-0 Design Competition (1 Unit) Undergraduate teams compete in McCormick's annual autonomous robot contest. Work begins winter quarter; teams must pass a qualifying milestone to register for credit in spring quarter. Students may register for this course no more than twice.

DSGN 370-0 Engineering Design Portfolio (1 Unit) Creation of design projects that showcase engineering work and further career goals. The portfolio physically presents a story that embodies its creator's goals.

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

DSGN 380-1 Industrial Design Projects I (1 Unit) Design thinking; user-centric principles of design and DFM. Industrial design project for personal portfolio development. Concept ideation and sketching; use of discovery research and data visualization; problem framing and prototyping; design for manufacturing, Keyshot rendering, rapid prototyping. Prerequisite: DSGN 320-0 or both DSGN 220-0 and DSGN 240-0.

DSGN 380-2 Industrial Design Projects II (1 Unit) Design thinking; user-centric principles of design and DFM. Industrial design project for personal portfolio development. Concept ideation and sketching; use of discovery research and data visualization; problem framing and prototyping; design for manufacturing, Keyshot rendering, rapid prototyping. Prerequisite: DSGN 320-0 or both DSGN 220-0 and DSGN 240-0.

DSGN 384-1 Interdisciplinary Design Projects I (1 Unit) Open-ended, team-based product or system design projects in real-world settings. Sequence must be taken in consecutive quarters. Project research, concept development, professional communication, advanced topics in design. Prerequisite: DSGN 106-1.

DSGN 384-2 Interdisciplinary Design Projects II (1 Unit) Open-ended, team-based product or system design projects in real-world settings. Sequence must be taken in consecutive quarters. Implementation, evaluation, communication, documentation. Prerequisite: DSGN 384-1.

DSGN 386-0 Manufacturing Engineering Design (1 Unit) Hands-on design project addressing manufacturing engineering design topics, such as automation, quality control, process planning, tooling design, concurrent engineering, and continuous improvement. Factory-CAD, Factory-FLOW, and Factory-VIEW. Prerequisite: MECH_ENG 340-1 or consent of instructor.

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

DSGN 397-0 Advanced Topics in Design (0.5 Unit) Topics suggested by students and faculty and approved by the institute.

DSGN 399-0 Independent Study Project (1 Unit) Independent study on a manufacturing engineering topic supervised by a faculty member. Prerequisite: consent of instructor.