Certificate in Engineering Design

Segal Design Institute

Purpose

The Certificate in Engineering Design (CED) program enables undergraduate students to develop design knowledge and skills that will provide them a competitive edge in their careers. The CED program focuses on innovative engineering design in a team-based, cross-disciplinary setting, and includes identifying and solving real-world problems, for actual clients.

Requirements

The Certificate in Engineering Design involves a set of courses and design experiences that can augment any McCormick degree program.

Required Courses	3
Elective credits	3
Engineering Design Portfolio	Required

No more than two of the courses needed for the Certificate in Engineering Design may also be used to fulfill the requirements in the "Major Program" of your BS degree as described in the undergraduate catalog. No certificate courses may be taken P/N. Courses with a grade lower than a "C" cannot be counted toward the certificate.

Any student interested in pursuing the certificate should complete the Declaration of Intent to Pursue form and contact Stacy Benjamin at s-benjamin@northwestern.edu.

Required Courses

DSGN 298 Interdisciplinary Design Projects I* (offered FQ and WQ)
DSGN 398 Interdisciplinary Design Projects II* (offered WQ and SQ)
DSGN 370 Engineering Design Portfolio and Presentation

*Students are expected to take DSGN 298 and DSGN 398 as a back-to-back sequence. For example, if you enroll in DSGN 298 fall quarter you are expected to take DSGN 398 the following winter quarter.

Elective Courses

Must be selected from the Approved Courses list (following pages) and meet these criteria:

- Not all courses may be selected from the same category
- At least 1 unit must be a DSGN course
- At least 2 units must be 300 level

Engineering Design Portfolio

Each student must create and present an engineering design portfolio demonstrating proficiency in the following areas, as appropriate:

- Design process – evidence of effective planning and successful completion of a design project
- Design analysis – use of analytical methods for decision-making and/or parameter optimization
- Prototyping and implementation – evidence that student has built working artifacts
- Modern software tools – evidence that student has gained proficiency with at least one such tool
- Effective communication – accessible presentation of technical concepts; persuasion; oral presentation skills

The engineering design portfolio must be completed and presented to the Segal design community prior to graduation.

Certificate in Engineering Design – Approved Elective Course List

Course Number	Course Title	Comments
Group 1: Design		
DSGN 344	Manufacturing Engineering Design	
IEMS 307	Quality Improvement by Experimental Design	
ART 225	Intermediate Drawing	
DSGN 245-1	Computer-Aided Design I	Half unit course
DSGN 245-2	Computer-Aided Design II	Half unit course
ME 333	Mechatronics	
DSGN 297 or 397	Selected topics in design	Half unit courses; Content must be approved as relevant to Group 1
DSGN 307	Introduction to Industrial Design Methods	
ME 341	Computational Methods for Engineering Design	
ME 366	Design of Engineered Multifunctional Devices and Metamaterials	Pre-reqs: ME 365 or CE 327 or consent by instructor
DSGN 308	Principles of Human Centered Design	
CIV ENG 395	Architectural Engineering and Design	
DSGN 395	Selected Topics in Design	Content must be approved as relevant to Group 1
DSGN 399	Independent Study	No more than 1 unit
Group 2: Social Sciences and "Techmanities"		
Psych 228	Cognitive Psychology	Pre-requisites can be waived
English 205	Intermediate Composition	
Comm St 250	Small Group Processes	
CS 330	Human-Computer Interaction	
DSGN 297 or 397	Selected Topics in Design	Half unit courses; Content must be approved as relevant to Group 2
DSGN 371	Communicating Complex Data	Half unit course
DSGN 395	Selected Topics in Design	Content must be approved as relevant to Group 2
Group 3: Business and Society		
IEMS 326	Economics and Finance for Engineers	
IEMS 325	Engineering Entrepreneurship	
CE 302	Engineering Law	
IEMS 342	Organizational Behavior	
IEMS 343	Project Management for Engineers	
Bus Inst 239	Marketing Management	
Chem E 390	Personal and Organizational Effectiveness	
IEMS 345	Negotiations and Conflict Resolution for Engineers	
Poli Sci 204	Politics and Nature	
Poli Sci 371	Environmental Politics	

DSGN 297 or 397	Selected Topics in Design	Half unit courses; Content must be approved as relevant to Group 3
DSGN 350	Invention and Innovation	
Bus Inst 390-22	Sustainable Innovation	
DSGN 395	Special topics: Fundamentals of Lean Six Sigma	
IEMS 428	Design for Six Sigma	