

# INDUSTRIAL DESIGN

<http://www.design.iastate.edu/industrialdesign/index.php>

## BID Bachelor of Industrial Design

Students in this program take a carefully defined sequence of courses developed to give them exposure and practice in the areas of theory and skill required by industrial design. These include drawing, form development, history, creative thinking, engineering principles, research, design methodology, human factors, computer-aided design, manufacturing, and commercial factors. In their third year, students will select electives from concentration tracks arranged around specialty areas and current issues in the profession. The upper-level studio classes are reserved for study abroad, internships, and sponsored projects with students from other departments and colleges.

## Curriculum in Industrial Design

The curriculum in Industrial Design leads to a 132.5-credit undergraduate Bachelor of Industrial Design including the 30.5-credit Core Design Program.

Admission into the professional program depends upon available resources and is subject to the approval of a faculty committee at the completion of the Core Design Program. Applicants are reviewed on the basis of academic performance, a portfolio of original work, and a written essay.

Transfer students with studio credits from other programs, colleges, and universities must present for departmental review a portfolio of work done in those courses in order to have the credits apply toward studio requirements. Students are required to present this portfolio upon admission and prior to registration for classes. Arrangements for this process must be made with department advisers.

A 45-graduate-credit post-professional graduate program is also offered leading to the degree Master of Industrial Design. (NOTE: Applicants without a degree or background in industrial design may be required to complete up to 18 additional credits of coursework.)

### Total Degree Requirements: 132.5 credits

Only 65 credits from a two-year institution may apply, which may include up to 16 technical credits; 9 P-NP credits of free electives; 2.00 minimum GPA.

### International Perspective: 3 credits

### U.S. Diversity: 3 credits

### Communications: 10 credits

ENGL 150	Critical Thinking and Communication (*)	3
ENGL 250	Written, Oral, Visual, and Electronic Composition (*)	3
LIB 160	Information Literacy	1

One of the following:	3
COMST 101	Introduction to Communication Studies
COMST 102	Introduction to Interpersonal Communication
CMDIS 286	Communicating with the Deaf
SP CM 110	Listening
SP CM 212	Fundamentals of Public Speaking
THTRE 251	Acting I
Total Credits	10

\* with a C or better

### Humanities: 6 credits

6 credits from program curriculum sheet

### Social Sciences: 6 credits

6 credits from program curriculum sheet

### Math/Physics/Biol.Sciences: 6 credits

6 credits from program curriculum sheet

### General Education Courses: 9 credits

6 credits of course level 300-400 from program curriculum sheet:  
complete 3 credits from department curriculum sheet.

### College of Design Core: 11.5 credits

DSN S 102	Design Studio I	4
DSN S 115	Design Collaborative Seminar	0.5-1
or DSN S 110	Design Exchange Seminar I	
DSN S 131	Drawing I	4
DSN S 183	Design in Context	3
Total Credits		11.5-12

### History, Theory and Criticism: 15 credits

IND D 231	Introduction to Industrial Design	3
IND D 387	History of Industrial Design I	3
IND D 388	History and Culture of Industrial Design II	3
Two courses from the approved course list; must include one 300 level or higher.		6

### Industrial Design: 60 credits

IND D 201	Industrial Design Studio I	6
IND D 202	Industrial Design Studio II	6
IND D 232	Creative Thinking for Industrial Design	3
ARTID 251	Human Factors in Design	3
ENGR 260	Engineering: Getting from Thought to Thing	3
ENGR 270	Survey of How Things Work	3
IND D 301	Industrial Design Studio III	6
IND D 332	Design Research Methods	3
IND D 334	Materials and Processes for Industrial Design	3
IND D 341	Computer Aided Industrial Design I	3

IND D 499	Senior Project	6
IND D 543	Portfolio and Professional Practice	3
Experiential Learning: 12 credits		12
IND D 302	Industrial Design Studio IV	
IND D 397	Industrial Design Internship	
IND D 401	Industrial Design Studio	
IND D 495	Study Abroad Option	
IND D 507	Industrial Design Practicum	
IND D 590	Special Topics	
IND D 592	Special Projects	
IND D 593	Experiential Learning Special Projects	
IND D 595	Study Abroad Option	
IND D 597	Internship	
Total Credits		60

**Concentration track electives: 9 cr.**

Sequence of electives assembled to create a focused area of study.

See also: a 4-year plan of study grid showing course template by semester.

Industrial Design

**First Year**

Fall	Credits Spring	Credits
DSN S 102 or DSN S 131	4 DSN S 102 or DSN S 131	4
DSN S 183 or General Education	3 DSN S 183 or General Education	3
ENGL 150 or General Education	3 ENGL 150 or General Education	3
DSN S 110 or DSN S 115	0.5-1.0 General Education	3
General Education	3 General Education	3
General Education	3 LIB 160	1
16.5-17		17

**Second Year**

Fall	Credits Spring	Credits
IND D 201	6 IND D 202	6
IND D 231	3 IND D 232	3

ENGR 260	3 IND D 388	3
ARTID 251	3 ENGR 270	3
IND D 387	3 IND D 334	3
18		18

**Third Year**

Fall	Credits Spring	Credits Summer	Credits
IND D 301	6 IND D option studio	6 Study Abroad	6
IND D 332	3 Elective	3 Elective	3
IND D 341	3 Elective	3	
Elective	3 Elective	3	
15		15	9

**Fourth Year**

Fall	Credits Spring	Credits
IND D option studio	6 IND D 499	6
Elective	3 IND D 543	3
Elective	3 Elective	3
Gen Ed or Elective	3 Gen Ed or Elective	3
15		15

## Graduate Study

**The Master of Industrial Design (M.I.D.)**

Innovation requires breaking boundaries and making connections between diverse disciplines. As a creative profession, industrial design deals with the design of innovative, sustainable and durable solutions for people, nonhumans, economy and society which may take many forms from tangible artifacts to expansive system designs. The Master of Industrial Design (M.I.D.) program at Iowa State University specifically emphasizes strategy and innovation with a strong focus on empathetic human-centered design research. It is centralized on the creation and application of new knowledge through in-depth investigations culminating in a written thesis. At the same time, students expand their design practice skills using innovative methodologies, collaboratively throughout the entire design process. Students explore, generate, transfer and implement multidisciplinary information and technologies into foundational knowledge for the discipline of industrial design.

**The M.I.D.** is traditionally recognized as a terminal degree in industrial design. The graduate program is designed to offer significant mix of skills and experiences, including faculty-directed research programs, internships, international travel, industry-sponsored coursework and design teaching experience. The graduate research focuses on three

main areas: 1) Innovation through Design, 2) Design as Strategy, and 3) Human-Centered Design. These areas are defined by the existing faculty members' research and creative activities, and focus on developing a new type of industrial designer mastering in any one of these specializations. Program faculty have extensive expertise in design thinking, human-centered research methods, cultural issues, product realization, design management, eco-design, social responsibility, and entrepreneurship.

The M.I.D. is a 63-credit study, distributed across three consecutive years. Applicants are required to have design and/or engineering degrees from accredited institutions or relevant industry experience.

### M.I.D. Program Philosophy

The goal of the Industrial Design graduate program is to create an agile program that addresses current and emerging issues in design strategy, innovation and human-centered design. Its position, in one of the most comprehensive design colleges in the country, facilitates the integration of methodologies and skillsets from multiple disciplines. Additionally, ties to the nationally ranked College of Engineering, the College of Business and industry collaborators create some truly unique degree specializations. Students are able to explore advanced concepts in such areas as extended manufacturer responsibility, supply chain and logistics, international vendor relations, advanced materials and biopolymers, and alternative business models.

## Curriculum Outline

### First Year

Fall	Credits Spring	Credits
IND D 501 rotating faculty; course directly related to teaching faculty's research	6 IND D 502 rotating faculty; course directly related to teaching faculty's research	6
IND D 533X Human-Centered Research Methods	3 PSYCH 501/508/522 or RESEV 554/580 (qualitative research methods)	3
MGMT 502/503/504 (organizational/strategic management)	3 RESEV 552/553 <sup>quantitative</sup> research methods	3
IND D 511	1 IND D 511	1
	13	13

### Second Year

Fall	Credits Spring	Credits
IND D 503 (vertical studio with juniors)	6 IND D 504 (vertical sponsored studio)	6

IND D 632	3 IND D 632	3
GR ST 529	3 IND D 540	3
IND D 511	1	
	13	12

### Third Year

Fall	Credits Spring	Credits
IND D 699	6 IND D 699	6
IND D 543	3 Elective	3
Elective	3 Elective	3
	12	12

Summer: Study Abroad/Internship/Research Assistantship (optional)

### Courses primarily for undergraduates:

#### IND D 201: Industrial Design Studio I

(0-12) Cr. 6. F.

*Prereq: Admission to the industrial design program, enrollment in IND D 231.*

Product scale form development and visual communication.

#### IND D 202: Industrial Design Studio II

(0-12) Cr. 6. S.

*Prereq: IND D 201*

Through a progressive series of structured exercises and projects, IND D 202 covers basic modeling principles and three dimensional form development required for industrial design activity. These activities include explorative studies in: assembly, disassembly, process efficiency, structures, materials identification, hand fabrication, and testing. Students will work in a variety of media including: paper, foam core, polystyrene, and wood.

#### IND D 231: Introduction to Industrial Design

(3-0) Cr. 3. F.

*Prereq: DSN S 102 and DSN S 131, enrollment in 201; admission to the industrial design program through department review or permission of instructor.*

The history, definition, scope, and basic principles of industrial design. Overview of technical, artistic, and sociological context of the profession.

#### IND D 232: Creative Thinking for Industrial Design

(3-0) Cr. 3. S.

*Prereq: IND D 231*

Exploration of strategies, methods, and processes associated with creative thinking skills and problem solving. Discussion of the nature of creativity and its implications in different contexts that cross content boundaries.

**IND D 251: Activity-Centered Industrial Design**

(3-0) Cr. 3.

*Prereq: Admitted to Industrial Design Program and by permission of the instructor*

Introduction to design for complex and dynamic situations that include people, products, activities and environments. Emphasizes the relationship between internal and external factors that impact pleasure and performance in these systems. Includes an overview of human diversity and examines the role of the industrial designer in developing the artifacts of daily activity.

Meets U.S. Diversity Requirement

**IND D 260: Engineering: Getting from Thought to Thing**

(Cross-listed with ENGR). (3-0) Cr. 3. F.S.

What is engineering, technology and their roles in society? Investigation of engineering methods through case studies of everyday objects. Explore questions about the impact of technology in society. Apply engineering methods to design and failure analysis.

**IND D 270: Survey of How Things Work**

(Cross-listed with ENGR). (3-0) Cr. 3. F.S.

Removing mysteries surrounding science and technology. Identify key concepts from applied science and technology to obtain better understanding on how things work. Review and explain the principles behind the technologies which define our modern way of life. A survey of broad range of technology could include: cell phones, GPS, radio, television, computers, ultrasound, microwave ovens, automobile, bioengineering and other industrial and consumer technologies. Common day technology examples illustrating scientific knowledge and applications.

**IND D 301: Industrial Design Studio III**

(0-12) Cr. 6. F.

*Prereq: IND D 202*

Systematic design methodology and integration of creative thinking techniques.

**IND D 302: Industrial Design Studio IV**

(0-12) Cr. 6. F.S.

*Prereq: IND D 301 or permission of instructor*

Exploration of commercial factors in industrial design. Meets Industrial Design Experiential Learning Requirements.

**IND D 332: Design Research Methods**

(3-0) Cr. 3. F.

*Prereq: IND D 231 or permission of instructor.*

Survey of qualitative and quantitative methods with an emphasis on contextual user-centered research. Integration of user data collection, visualization, and synthesis as a source for design. Experience of a small-scale research practice related to industrial design.

**IND D 334: Materials and Processes for Industrial Design**

(3-0) Cr. 3. S.

*Prereq: IND D 201 and IND D 231.*

Introduction to materials and manufacturing methods for mass production and distribution of products.

**IND D 341: Computer Aided Industrial Design I**

(0-6) Cr. 3. F.S.

*Prereq: IND D 301*

Emphasis on the computer as an industrial design and visualization tool.

**IND D 351: Applied Human Factors Lab**

(0-1) Cr. 1. F.

*Prereq: IND D 231 and enrollment in ARTID 251*

Theory and application of human factors issues in the industrial design field, specifically their impact on the relationship of the user, the product, and the product systems.

**IND D 387: History of Industrial Design I**

(3-0) Cr. 3. F.

*Prereq: 30 credits earned at ISU*

Introduction to contemporary and historic factors influencing industrial design craft and practice. Discussion of social, political, cultural and technological context for industrial design.

Meets U.S. Diversity Requirement

**IND D 388: History and Culture of Industrial Design II**

(3-0) Cr. 3. S.

*Prereq: 30 credits earned at ISU.*

Critical examination of meanings of objects from the perspectives of history, design, material culture, philosophy and cultural studies. Discussion of social, political, cultural and technological context for industrial design.

**IND D 397: Industrial Design Internship**

(0-12) Cr. 6. F.S.SS.

*Prereq: IND D 202, 18 credits in industrial design, permission of instructor.*

Professional industrial design, off-campus experience. Meets Industrial Design Experiential Learning Requirements.

**IND D 401: Industrial Design Studio**

(0-12) Cr. 6. F.S.

*Prereq: IND D 301 or permission of instructor*

Advanced topics focused on industrial design applications. Topics vary each time offered. Meets Industrial Design Experiential Learning Requirements.

**IND D 490: Special Topics**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Advanced topics focused on industrial design applications. Topics vary each time offered. A. Theory, Criticism, Methodology B. Experimental Techniques C. Three Dimensional Design D. Distributed Collaboration.

**IND D 490A: Special Topics: Theory, Criticism, Methodology**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Advanced topics focused on industrial design applications. Topics vary each time offered.

**IND D 490B: Special Topics: Experimental Techniques**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Advanced topics focused on industrial design applications. Topics vary each time offered.

**IND D 490C: Special Topics: Three-Dimensional Design**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Advanced topics focused on industrial design applications. Topics vary each time offered.

**IND D 490D: Special Topics: Distributed Collaboration**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Advanced topics focused on industrial design applications. Topics vary each time offered.

**IND D 495: Study Abroad Option**

(0-12) Cr. 6. F.S.SS.

*Prereq: IND D 202 and permission of instructor*

International study abroad program. Visits to design studios, showrooms, museums and manufacturing facilities. Meets Industrial Design Experiential Learning Requirements.

**IND D 499: Senior Project**

(0-12) Cr. 6. S.

*Prereq: IND D 495 or IND D 507 and senior standing*

Advanced practice in specialized area of industrial design. Topics vary.

**Courses primarily for graduate students, open to qualified undergraduates:**

**IND D 501: Industrial Design Studio Intensive I**

(0-12) Cr. 6. F.

*Prereq: Admission into the Graduate Intensive Track or graduate standing in the industrial design program.*

Basic concepts and techniques for industrial design. Emphasis on form development, structure, function and communication.

**IND D 502: Industrial Design Studio Intensive II**

(0-12) Cr. 6. S.

*Prereq: Admission into the Graduate Intensive Track or graduate standing in the industrial design program.*

Advanced concepts and techniques for industrial design. Emphasis on systematic design methodology and commercial factors, and visual and verbal communication of design problems and solutions.

**IND D 503: Industrial Design Studio I**

(0-12) Cr. 6. F.

*Prereq: Admission to the industrial design graduate program or completion of Graduate Intensive Track.*

Advanced, project-based application of industrial design concepts and techniques.

**IND D 504: Industrial Design Studio II**

(0-12) Cr. 6. S.

*Prereq: IND D 502.*

Advanced, project based application of industrial design concepts and techniques, with an emphasis on service and system design, and its implications for the community.

**IND D 507: Industrial Design Practicum**

(0-12) Cr. 6. F.S.

*Prereq: Evidence of satisfactory experience in area of specialization; admitted by application and written permission of instructor only.*

Studio project focused on topics generated with external partners. Topics vary. Meets Industrial Design Experiential Learning Requirements.

**IND D 511: Colloquium**

(1-0) Cr. 1. Repeatable. F.S.

*Prereq: Admission into the Graduate Intensive Track or graduate standing in the industrial design program.*

Presentation and discussion of creative activity carried out in various design disciplines and their relationship to industrial design. Seminar sessions focusing on exemplary pieces of design research undertaken by faculty and graduate students in the design field.

**IND D 532: Design Thinking**

(3-0) Cr. 3. F.S.

*Prereq: Senior or graduate standing in any ISU program, or permission of the instructor.*

Exploration of design thinking process, toolkits, and mindsets as creative problem solving approaches for systems, products, and processes, across diverse contexts. Strategies for problem-solution co-evolution process, with a focus on collaborative and interdisciplinary design to investigate real-world problems and opportunities.

**IND D 534: Product Realization for Industrial Design**

(3-0) Cr. 3. S.

*Prereq: Admission into the Graduate Intensive Track or graduate standing in the industrial design program.*

Introduction to materials and manufacturing methods for products. Exploration of emerging materials and new applications.

**IND D 540: Visual Communication for Industrial Design**

(0-6) Cr. 3. F.S.

*Prereq: Advanced standing in any ISU program*

Exploration of multiple visual communication techniques primarily used in industrial design with a focus on visually breaking down complex information.

**IND D 541: Computer Aided Industrial Design**

(0-6) Cr. 3. F.S.

*Prereq: Completion of industrial design studio or permission of instructor.*

Exploration of the computer as an industrial design and visualization tool. Advanced concepts in computer to machine interface for manufacture.

**IND D 543: Portfolio and Professional Practice**

(1-4) Cr. 3. F.S.

*Prereq: Advanced standing in the industrial design program.*

Discussion of industrial design practice and career planning. Development and preparation of personal promotional materials for a range of media.

**IND D 551: Human Factors**

(3-0) Cr. 3. S.

*Prereq: IND D 532*

Human factors issues and the study of relationships between the user, the product, and the human body and its physical functions. Investigations of bio-mechanics, anthropometry, instrumental displays and control, and their measurement as they relate to the design process.

**IND D 590: Special Topics**

(1-4) Cr. 3. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.* Advanced topics focused on industrial design applications. Topics include theory, criticism, methodology, experimental techniques, three dimensional design, distributed collaboration. Meets Industrial Design Experiential Learning Requirements.

**IND D 592: Special Projects**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Planned projects in topics related to theory, criticism, methodology, experimental techniques, three dimensional design, distributed collaboration.

**IND D 593: Experiential Learning Special Projects**

Cr. arr. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

Project based topics related to theory, criticism, methodology, experimental learning, three dimensional design, distributed collaboration that supports experiential learning.

**IND D 595: Study Abroad Option**

(0-12) Cr. 6. Repeatable. F.S.SS.

*Prereq: Completion of industrial design studio or permission of instructor.*

International study abroad program. Visits to design studios, showrooms, museums and manufacturing facilities. Meets Industrial Design Experiential Learning Requirements.

**IND D 597: Internship**

(0-12) Cr. 6. Repeatable. F.S.SS.

*Prereq: Completion of Industrial design studio or permission of instructor.*

Professional industrial design, off-campus experience. Meets Industrial Design Experiential Learning Requirements.

**Courses for graduate students:**

**IND D 601: Graduate Project I**

(0-12) Cr. 6. F.

*Prereq: IND D 632*

Advanced creative component in specialized area of focus within industrial design. Culminates in a development plan and supporting documentary.

**IND D 602: Graduate Project II**

(0-12) Cr. 6. S.

*Prereq: IND D 601*

Advanced creative component in specialized area of focus within industrial design. Culminates in a physical or digital artifact and supporting documentation.

**IND D 631: Design Research Methods**

(3-0) Cr. 3. F.

*Prereq: Senior or graduate standing in any ISU program, or permission of the instructor*

User-centered research methods to examine the impact of design on humans, environments, and social contexts. Examination and critique of current research methods employed in industrial design, service design and user experience (UX) design.

**IND D 632: Thesis Preparation**

(3-0) Cr. 3. S.

*Prereq: IND D 631*

Exploration and formulation of graduate thesis or project topics, with proposed studies and investigations. Introduction to structuring a design research prospectus and university requirements for graduation. Determine Faculty Committee and Program of Study and file forms with Graduate College.

**IND D 699: Thesis**

(0-12) Cr. 6. Repeatable. F.S.SS.

*Prereq: IND D 632*

Advanced research component in specialized area of focus within industrial design. Culminates in a thesis document.