

# 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 design sketching and visualization, form development, history, creative thinking, engineering principles, research, design methodology, human factors, computer-aided design, manufacturing techniques, commercial factors, management and strategic design development. In their third year, students select electives within and outside of the department, defining current issues in the profession. The upper-level studio classes are reserved for study abroad programs, internships, and sponsored projects with students from other departments and colleges, in collaboration with industry. The curriculum aims to develop the ability to cope with diverse problem areas in industrial design without restricting students to particular fields of specialization.

## Curriculum in Industrial Design

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

Admission into the professional program depends upon available departmental 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, previous high school record, and a portfolio of original work.

Transfer students with studio credits from other programs, colleges, and universities must present a portfolio of work done in those courses, for departmental review, in order to have the credits apply toward studio. 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 48-credit post-professional graduate program is also offered leading to the degree Master of Industrial Design.

### 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 211	Interpersonal Communication	
CMDIS 286	Communicating with the Deaf	
SP CM 110	Listening	
SP CM 212	Fundamentals of Public Speaking	
THTRE 251	Acting Foundations	
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 220X	Concept Sketching	3
IND D 232	Creative Thinking for Industrial Design	3
IND D 251	Activity-Centered Industrial Design	3
ENGR 260	Engineering: Getting from Thought to Thing	3
IND D 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: 9 credits		9
IND D 302	Industrial Design Studio IV	
IND D 397	Industrial Design Internship	
IND D 401	Industrial Design Studio	
IND D 402X	Designing for Social Impact	
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

**Industrial Design departmental electives: 9 credits**

List of electives assembled to support a focused area of study.

IND D 240X	Digital Tools for Industrial Design	3
IND D 435X	Strategic Design: Integrated Project Development	3
IND D 532	Design Thinking	3
IND D 534	Product Realization for Industrial Design	3
IND D 540	Visual Communication for Industrial Design	3
IND D 551	Human Factors	3
IND D 560X	Change by Design: Disruptive Innovation	3
IND D 565X	Technological and Engineering Literacy: STEM and Social Justice	3
IND D 570X	Systems Thinking in Design	3
IND D 580X	Material Culture and Values	3

See also: a 4-year plan of suggested study sequence showing courses by semester.

Industrial Design

**First Year**

Fall	Credits	Spring	Credits
DSN S 102 or 131	4	DSN S 102 or 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 115	0.5-1	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 210X	3	IND D 251	3
IND D 220X	3	IND D 270	3
ENGR 260	3	Departmental elective	3
		15	15

**Third Year**

Fall	Credits	Spring	Credits	Summer	Credits
IND D 301	6	IND D 302 (or IND D 402X or DSN S 546)	6	Study Abroad	6
IND D 332	3	IND D 232	3	Elective	3
IND D 334	3	IND D 370X	3		
IND D 340X	3	IND D 380X	3		
		15	15		9

**Fourth Year**

Fall	Credits	Spring	Credits
IND D 593	3-6	IND D 499	6
Departmental elective	3	IND D 440X	3
Departmental elective	3	Departmental Elective	3
Gen Ed or Elective	3	Gen Ed or Elective	3
		12-15	15

**Graduate Study**

Designing for Future Industries

**Master of Industrial Design | MID**

48-credit study | distributed across two consecutive years

How will (Industrial) Design look like in the future? Where is the field going? What new methods and methodologies will be needed to tackle current and emergent global issues? What will it mean to be human in the age of Artificial Intelligence? How will design disciplines answer to these new futures, new typologies of users and ever-changing technologies?

These are just some of the questions that keep us awake in the new MID program! In an age where new technologies and automation are continually changing the way we think about human activities and future jobs, Industrial Design is faced with challenges that question the field itself. Designing successfully for and with new industries and technologies will require ambidextrous designers, that are flexible, critical, creative and highly capable of working and collaborating in different contexts, across domains and most importantly under different roles. Design practitioners, scholars and students will need to be more than developers, managers or human-centered researchers - they will need to be change-makers, leaders and above all Connectors. The MID program offers a competence-based curriculum, with tools and training on how to be[come] this design connector of the future.

#### Description of the degree | the bigger picture

The Master of Industrial Design (MID) program at the College of Design, Iowa State University, specifically emphasizes *systems thinking* as one of its core languages when reframing problems as opportunities for future contexts. Systems design, change theory, problem reframing, strategic and creative thinking, and innovation by design are some of the fundamentals of the MInD framework.

Industrial DesignIt is a human-centered discipline that questions existing boundaries and makes connections among diverse domains. Therefore, the program challenges students to develop the ability to recognize and define problems in new ways, and thus find opportunities others might have missed or undervalued. As a strategic problem-solving process, Industrial Design tries to reimagine how we should go about developing innovative, sustainable and durable solutions for people and society at large that genuinely lead to better quality of life and better futures. The MID program actively connects with other knowledge domains and disciplines, to research how things are with the drive to propose how they ought to be. This is achieved through the challenging balance between critical and creative ways of thinking [and working] when devising novel, useful and meaningful artifacts, services, experiences and environments. Ultimately, the program integrates the design triad of people, business and technology, in innovative ways, and is based on insightful research to create new value and competitive advantage in a variety of societal, economic and environmental contexts.

#### Details about the degree | zooming in

The MID program is centralized on the creation and application of new knowledge through in-depth investigations of existing 'gaps'

culminating in a graduation project, which includes a creative component (grad studio-based) or a written thesis (research project). At the same time, students expand their design practice skills using different methodologies, collaboratively, throughout the entire design process. They explore, generate, transfer and implement interdisciplinary insights into foundational knowledge for the discipline of Industrial Design.

The MID is accredited and recognized as a terminal degree in Industrial Design. This graduate program is designed to offer significant mix of skills and experiences, including students from different disciplinary backgrounds, faculty-directed research programs, internships, international study abroad, industry-sponsored coursework and also teaching experience.

The MID program is positioned in one of the most comprehensive design colleges in the country, facilitating the integration of methodologies and skillsets from multiple disciplines. Additionally, the program has established curricular connections to the nationally ranked College of Engineering and the College of Business at Iowa State University, as well as to numerous industry collaborators and practitioners.

Degree requirements includes a completion of a 2-year, 48-credit program, including a required core (30 credits), departmental electives or experiential learning credits (15 electives), and one of the following: creative component with a design process report (3 credits) or research-based written thesis (3 credits). To note that students and faculty work collaboratively on this required final grad project irrespective of graduation final deliverable: integrating both theory and creation, and research with/for design problem-solving.

## Curriculum Outline

Required Core Courses: 30 cr.

IND D 501	Industrial Design Studio Intensive I	6
IND D 502	Industrial Design Studio Intensive II	6
IND D 532	Design Thinking	3
IND D 580X	Material Culture and Values	3
IND D 601	Graduate Project I	6
IND D 602	Graduate Project II (or IND D 699)	6
IND D 631	Design Research Methods	3
IND D 632	Thesis Preparation	3

Departmental Electives 15 cr.

IND D 435X	Strategic Design: Integrated Project Development	
IND D 511	Colloquium	1
IND D 540	Visual Communication for Industrial Design	3
IND D 551	Human Factors	3
IND D 560X	Change by Design: Disruptive Innovation	3
IND D 570X	Systems Thinking in Design	3

Or Experiential Learning: 15 cr.

IND D 592	Special Projects (3-6 credits)	arr
IND D 593	Experiential Learning Special Projects (3-6 credits)	arr
IND D 595	Study Abroad Option	6
IND D 597	Internship	6

† Arranged with instructor.

#### First Year

Fall	Credits Spring	Credits
IND D 501	6 IND D 502	6
IND D 510X	3 IND D 520X or IND D 450X	3
IND D 530X	3 IND D 580X	3
IND D 570X	3 IND D 640X	3
	15	15

#### Second Year

Fall	Credits Spring	Credits
IND D 601 (3-6 credits)	6 IND D 602 or 699 (3 - 6 credits)	6
IND D 560X	3 IND D 550X	3
IND D 670X	3 IND D 630X	3
	12	12

Admission to the MID program is by application to the department and to the Graduate College. The MID program does not require a bachelor's degree in industrial design and is open to students from any other disciplinary background. Information about our programs and how to apply can be obtained from the department's web page at: [www.design.iastate.edu/](http://www.design.iastate.edu/) (<http://www.design.iastate.edu/CRP>)<https://www.design.iastate.edu/industrial-design/degrees/master-of-industrial-design/>, or send an email directly to graduate recruitment services [merfoleymid@iastate.edu](mailto:merfoleymid@iastate.edu).

#### 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:* Admission to the industrial design program or by permission of the 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 IND D 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. Repeatable.

*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.

*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. Repeatable.

*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: Graduate or senior status.*

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.