Industrial Design

Graduation Requirements

In addition to the requirements listed below, students must satisfy the University regulations, including the process of Academic Performance Evaluation (see the *Academic Regulations of the University* section of this Calendar), and the *Academic Regulations for the Bachelor of Industrial Design* .

Students should consult the School when planning their program and selecting courses.

Academic Performance Evaluation

Students in Industrial Design are subject to the standard Academic Performance Evaluation process with the following additions and amendments:

1. The Industrial Design program does not define a Major CGPA. Students are assessed at each Academic Performance Evaluation using their Overall CGPA and the Core minimum defined in 2 below.
2. The courses in the Industrial Design Core are as follows:

   Industrial Design Core

IDES 1300 [0.5]	Projects IA
IDES 1301 [0.5]	Projects IB
IDES 2300 [0.5]	Projects IIA
IDES 2302 [0.5]	Projects IIB
IDES 3300 [1.0]	Projects IIIA
IDES 3302 [0.5]	Projects IIIB
IDES 4310 [1.5]	Major Project
IDES 4301 [0.5]	Minor Projects A
IDES 4302 [0.5]	Minor Projects B

   Good Standing requires a grade of C- or better in each course of the Industrial Design Core.
3. Students in Industrial Design are either in *Good Standing* or on Academic Warning. Students who satisfy the conditions for *Suspension* at an Academic Performance Evaluation must leave the Industrial Design program with the status *Ineligible to Return* (ITR).
4. For more information regarding academic performance evaluation in the B.I.D. program, consult the *Academic Regulations of the University ,* and *Academic Regulations for the Bachelor of Industrial Design Degree* sections of this Calendar.

Prerequisites

The following broad course prerequisites specify requirements for access to upper year project courses.

Registration in IDES 2300 Projects IIA normally requires successful completion of IDES 1001, IDES 1301 and must not be deficient in any more than one of the other **first-year** courses.

Registration in IDES 3300 [1.0] Projects IIIA normally requires successful completion of all **first-year** and **second-year** course requirements.

Registration in IDES 4310 [1.5] Major Project normally requires successful completion of all **third-year** course requirements.

Absence and Readmission

Students in Industrial Design who intend to be absent for a fall/winter session must request permission from the School in advance. Students who are absent for a fall/winter session without permission will be required to apply for readmission to the program in advance of registration.

Program Requirements

Industrial Design
B.I.D. (20.0 credits)

First Year

1. 5.0 credits in:		5.0
IDES 1000 [0.5]	Theory and History of Design	
IDES 1001 [0.5]	Industrial Design Analysis	
IDES 1300 [0.5]	Projects IA	
IDES 1301 [0.5]	Projects IB	
ECON 1000 [1.0]	Introduction to Economics	
MATH 1107 [0.5]	Linear Algebra I	
PSYC 1001 [0.5]	Introduction to Psychology I	
PSYC 1002 [0.5]	Introduction to Psychology II	
PHYS 1007 [0.5]	Elementary University Physics I	
Second Year		
2. 4.0 credits in:		4.0
IDES 2101 [0.5]	Series and Mass Production Technology A	
IDES 2102 [0.5]	Series and Mass Production Technology B	
IDES 2105 [0.5]	Computer Applications	
IDES 2205 [0.5]	Sensory Aspects of Design	
IDES 2300 [0.5]	Projects IIA	
IDES 2302 [0.5]	Projects IIB	
IDES 2600 [0.5]	Ergonomics for Product Design	
PSYC 3702 [0.5]	Perception	
3. 0.5 credit in:		0.5
Architecture, Art History, Business, Computer Science, Engineering, Mathematics, Physics, Psychology, or Technology, Society, Environment Studies		
4. 0.5 credit in free electives		0.5
Third Year		
5. 3.0 credits in:		3.0
IDES 3300 [1.0]	Projects IIIA	
IDES 3302 [0.5]	Projects IIIB	
IDES 3502 [0.5]	Contextual Nature of Products	
IDES 3503 [0.5]	Professional Practice	
IDES 3601 [0.5]	Industrial Design and the User	
6. 0.5 credit in:		0.5
BUSI 2204 [0.5]	Basic Marketing	
7. 1.0 credit in electives at the 2000-level or above		1.0
8. 0.5 credit in:		0.5
IDES 3104 [0.5]	Exhibition Design	
IDES 3105 [0.5]	Visual Communication and Package Design	
IDES 3106 [0.5]	Advanced Computer Applications	
IDES 3202 [0.5]	Adv. Studies in Form and Colour	

IDES 3305 [0.5]	Special Studies	
IDES 3306 [0.5]	Special Studies	
Fourth Year		
9. 3.5 credits in:		3.5
IDES 4001 [0.5]	Industrial Design Seminar	
IDES 4301 [0.5]	Minor Projects A	
IDES 4302 [0.5]	Minor Projects B	
IDES 4310 [1.5]	Major Project	
IDES 4400 [0.5]	Internship Field Report	
10. 1.5 credits in approved electives at the 3000-level or above		1.5
Total Credits		**20.0**

Notes:

1. Fourth-year students are required to register in IDES 4301, IDES 4302 and IDES 4310 in the same academic year.
2. One successfully completed Industrial Design Co-op work term between the third and fourth year of study is equivalent to IDES 4400.
3. The electives under Item 10 above must be chosen in consultation with the School on the following principles:
   a. the electives chosen should serve to deepen the student's understanding of fields related to Industrial Design or disciplines that are relevant for industrial designers;
   b. the electives chosen should preferably be related to the Industrial Design projects and provide basic and/or actual information for these projects.

Minor in Design (4.0 credits)

This minor is open to all undergraduate degree students not in the Industrial Design program.
Only students pursuing undergraduate programs requiring at least 20.0 credits to graduate and who have completed at least 4.0 credits toward their degrees with a minimum overall CGPA of 7.00 may be admitted to the Minor in Design.

1. 1.5 credits in:		1.5
IDES 1000 [0.5]	Theory and History of Design	
IDES 1001 [0.5]	Industrial Design Analysis	
IDES 2205 [0.5]	Sensory Aspects of Design	
2. 2.5 credits from:		2.5
IDES 2600 [0.5]	Ergonomics for Product Design	
IDES 3104 [0.5]	Exhibition Design	
IDES 3105 [0.5]	Visual Communication and Package Design	
IDES 3305 [0.5]	Special Studies	
IDES 3306 [0.5]	Special Studies	
IDES 3502 [0.5]	Contextual Nature of Products	
IDES 3601 [0.5]	Industrial Design and the User	
IDES 4001 [0.5]	Industrial Design Seminar	
IDES 4101 [0.5]	Adv. Studies in Manufacturing	
IDES 4200 [0.5]	Form Organization	
IDES 4305 [0.5]	Special Studies	
IDES 4306 [0.5]	Special Studies	
3. The remaining requirements of the major discipline(s) and degree must be satisified.		
Total Credits		**4.0**

School of Industrial Design

Faculty of Engineering and Design

IDES 1000 [0.5 credit]
Theory and History of Design
The theoretical and historical background of industrial design and design; disciplinary foundations and interdisciplinary connections; methodological aspects and economic and social contexts; contemporary scenarios in design; technological innovation and manufacturing processes.
Also listed as ARCH 2006.
Lectures three hours a week.

IDES 1001 [0.5 credit]
Industrial Design Analysis
Principles of comparative product design analysis covering marketing and sales, manufacturing techniques and materials, ambiance and qualities of the object/context relationship, and design analysis from the perspective of the designer, the maker and the user.
Also listed as ARCH 2101.
Prerequisite(s): IDES 1000 (ARCH 2006).
Lectures three hours a week.

IDES 1300 [0.5 credit]
Projects IA
An introduction to the skills and processes of industrial design including drawing and sketching as an aid to design, basics of line, shape, ideation, and visualization, product drawing, presentation techniques, basic model making, studio equipment and practices, introduction to the design process.
Prerequisite(s): IDES 1000 (may be taken concurrently).
Studio and lectures six hours a week.

IDES 1301 [0.5 credit]
Projects IB
Aspects of industrial design theory and practice, specifically those dealing with principles of product development, fundamentals of form and colour and case studies. Students will explore the design process with emphasis on creative problem-solving techniques and visual communication in design.
Prerequisite(s): IDES 1300.
Studio and lectures six hours a week.

IDES 2101 [0.5 credit]
Series and Mass Production Technology A
Transformation techniques applied to manufacturing materials. Part-design requirements and cost factors for manufacturing processes. Influences and role of assembly, finishing, production tooling, and costing.
Prerequisite(s): IDES 1001, IDES 1301.
Lecture and tutorials three hours a week, laboratory three hours a week.

IDES 2102 [0.5 credit]
Series and Mass Production Technology B
Continuation of IDES 2101. Transformation techniques applied to manufacturing materials. Part-design requirements and cost factors for manufacturing processes. The influences and role of assembly, finishing, production tooling, costing are addressed.
Prerequisite(s): IDES 2101 or permission of the School of Industrial Design.
Lecture and tutorials three hours a week, laboratory three hours a week.

IDES 2105 [0.5 credit]
Computer Applications
Provides industrial design students with a working knowledge of design related 3D computer applications, as well as graphic manipulation and illustration software. Labs and projects are oriented towards building a foundation in software and group work skills for studio courses.
Prerequisite(s): IDES 1301.
Lecture and tutorials three hours a week.

IDES 2205 [0.5 credit]
Sensory Aspects of Design
An exploration of multi-sensory qualities derived from and designed into products to optimize sensory experiences. Visual, tactile, auditory, and other related design elements and principles that contribute to the product multi-sensory characteristics while adding meaning and emotional value. Precludes additional credit for IDES 2203 (no longer offered).
Prerequisite(s): IDES 1001 or permission of the School of Industrial Design.
Lectures and tutorials three hours a week.

IDES 2300 [0.5 credit]
Projects IIA
Principles of drawing and sketching used in the design process. Project topics include: sketching as a tool for problem definition; idea exploration and form development; rendering techniques and the communication of design concepts; basic physical modeling techniques as a complement to sketching and drawing.
Prerequisite(s): IDES 1001 and IDES 1301, or permission of the School of Industrial Design.
Studio and lectures six hours a week.

IDES 2302 [0.5 credit]
Projects IIB
Introduction to the design principles associated with adapting products to an existing product semantic. Topics covered: principles of design, product semantics, design analysis, design synthesis, design evaluation, and modeling techniques. The design project(s) explore some or all of the design principles covered in the lectures.
Prerequisite(s): IDES 2300 or permission of the School of Industrial Design.
Studio and lectures six hours a week.

IDES 2600 [0.5 credit]
Ergonomics for Product Design
Physical, biomechanical, environmental and cognitive issues. Displays, controls, workstations, tools and software interfaces are examined from scientific and practical perspectives.
Prerequisite(s): PSYC 1001 and PSYC 1002, or PSYC 1000.
Lectures and discussion three hours a week.

IDES 3104 [0.5 credit]
Exhibition Design
The field of exhibition design is explored through lectures and case studies. Students undertake a preliminary exercise in display and exhibition design prior to the development and implementation of an exhibition; this normally involves the design of the School of Industrial Design's Annual Graduation Exhibition.
Prerequisite(s): IDES 2205 and IDES 2302 or permission of the School of Industrial Design.
Lectures and tutorials three hours a week.

IDES 3105 [0.5 credit]
Visual Communication and Package Design
A survey of visual communication and package design principles relevant to industrial designers. Product/brand definition and corporate identity through package design.
Prerequisite(s): IDES 2205 and IDES 2302 or permission of the School of Industrial Design.
Lectures and tutorials three hours a week.

IDES 3106 [0.5 credit]
Advanced Computer Applications
Examination of complex product geometry utilizing 3D computer applications. Topics include spline, surface and solids construction, surface verification tools, and rendering tools and techniques. Workflow, robust design, reverse design techniques and 3D printing will be explored through exercises.
Prerequisite(s): IDES 2105.
Lecture and tutorials three hours a week.

IDES 3107 [0.5 credit]
Design and Sustainability
Sustainability and the industrial designer’s role in creating more environmentally and socially responsible products. Imperatives and drivers for integrating sustainability into product design. Sustainable design strategies and tools, business case for sustainable design, and case studies.
Prerequisite(s): IDES 1001 and IDES 2302 or permission of the School of Industrial Design.
Lectures and tutorials three hours a week.

IDES 3202 [0.5 credit]
Adv. Studies in Form and Colour
Students may continue the research and study encountered in IDES 2205, IDES 2300 and IDES 2302 by doing advanced research in the phenomena of form and/or colour and their communicative functions in products. Directed Study.
Prerequisite(s): IDES 2205 and IDES 2302 or permission of the School of Industrial Design.
Lecture and tutorials three hours a week.

IDES 3300 [1.0 credit]
Projects IIIA
Introduction to the design principles associated with the evaluation and re-design of an existing product. Topics include: user/machine relationship, component packaging, and manufacturability. The design project(s) explore some or all of the design principles covered in the lectures.
Prerequisite(s): IDES 2205 and IDES 2302 or permission of the School of Industrial Design.
Studio and lectures twelve hours a week.

IDES 3302 [0.5 credit]
Projects IIIB
This course is an introduction to the principles of innovation as found in industrial design. Topics to be covered include: invention, innovation, entrepreneurship, basic mechanisms. The design project(s) explore some or all of the design principles covered in the lectures. Precludes additional credit for IDES 3301 (no longer offered).
Prerequisite(s): IDES 3300 or permission of the School of Industrial Design.
Studio and lectures six hours a week.

IDES 3305 [0.5 credit]
Special Studies
Special Industrial Design Studies deal with specific projects, which may differ from year to year depending on the availability of specialists in a particular field or study opportunities as they present themselves.
Prerequisite(s): IDES 2302 or permission of the School of Industrial Design.
Lectures, tutorials, laboratory and studio three hours a week or equivalent.

IDES 3306 [0.5 credit]
Special Studies
Special Industrial Design Studies deal with specific projects, which may differ from year to year depending on the availability of specialists in a particular field or study opportunities as they present themselves.
Prerequisite(s): IDES 2302 or permission of the School of Industrial Design.
Lectures, tutorials, laboratory and studio three hours a week or equivalent.

IDES 3502 [0.5 credit]
Contextual Nature of Products
Cultural subjects which have an influence on contemporary industrial design. The perspective of the course is anthropological: the context and cultural relevance of industrial design.
Prerequisite(s): IDES 1000 (ARCH 2006).
Lectures and tutorials three hours a week.

IDES 3503 [0.5 credit]
Professional Practice
The organizational aspects of consultancies and client responsibilities within the framework of corporate management. Topics include: the form of contracts for consultancy, determination of fees, legal implications, patents and copyrights. Guest lecturers.
Prerequisite(s): IDES 3300 or permission of the School of Industrial Design.
Lectures and discussion three hours a week.

IDES 3601 [0.5 credit]
Industrial Design and the User
Design methodology and the value of scientific methods for data collection and decision-making. Techniques such as interviewing, focus groups, usability testing, brainstorming, and value analysis will be covered. Teamwork techniques and values are considered.
Prerequisite(s): IDES 2600.
Lectures three hours a week, laboratory three hours a week.

IDES 3999 [0.0 credit]
Co-operative Work Term

IDES 4001 [0.5 credit]
Industrial Design Seminar
Topics vary yearly and address key contemporary industrial design issues. There is a focus on writing, discussion, and debate. Students organize a seminar with design professionals and other community experts including student and professional presentations, interaction, and discussion.
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Seminar three hours a week.

IDES 4101 [0.5 credit]
Adv. Studies in Manufacturing
Directed study in the field of manufacturing, centred on such topics as: cost analysis, new materials and processes, computer aided manufacturing, numerically controlled machining, machining of moulds, etc.
Prerequisite(s): IDES 2101 and IDES 2102.

IDES 4200 [0.5 credit]
Form Organization
Using form organization as a tool to design, the definition and prescription of monolithic solids by means of an abstract system; making and verifying materialized approximations of such solids.
Prerequisite(s): IDES 2300 and IDES 2302 or permission of the School of Industrial Design.
Lectures, tutorials and laboratory six hours a week.

IDES 4301 [0.5 credit]
Minor Projects A
Enables students to demonstrate through a series of short projects their versatility in product design or in complementary design fields such as communication, graphic design or design experiments. Emphasis is on time management and the ability to work independently on assigned projects.
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Studio and lectures six hours a week.

IDES 4302 [0.5 credit]
Minor Projects B
The application of required skills and team work in a comprehensive design project. The subject matter deals with broad issues in design.
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Studio and lectures six hours a week.

IDES 4305 [0.5 credit]
Special Studies
Like the third-year Special Industrial Design Studies, those of fourth year deal with specific projects, which may differ each year depending on the availability of specialists among the faculty of the School of Industrial Design or on particular opportunities as they present themselves.
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Lectures, tutorials, laboratory and studio three hours a week or equivalent.

IDES 4306 [0.5 credit]
Special Studies
Like the third-year Special Industrial Design Studies, those of fourth year deal with specific projects, which may differ each year depending on the availability of specialists among the faculty of the School of Industrial Design or on particular opportunities as they present themselves.
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Lectures, tutorials, laboratory and studio three hours a week or equivalent.

IDES 4310 [1.5 credit]
Major Project
Application of design principles in a comprehensive design project. Problem area chosen should be product oriented and of sufficient complexity. Normally undertaken in consultation with off-campus organizations and industry; supervised by faculty members.
Precludes additional credit for IDES 4300 (no longer offered).
Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.
Studio and lectures six hours a week in Fall and twelve hours a week in Winter.

IDES 4400 [0.5 credit]
Internship Field Report
Work experience related to industrial design. Following the internship period (12 weeks minimum), a comprehensive report describing observations and insights must be submitted by the end of the fourth week of the fall term.
Graded Sat or Uns.
Prerequisite(s): IDES 3300 or permission of the School of Industrial Design.
Tutorial hours arranged.

Summer session: some of the courses listed in this Calendar are offered during the summer. Hours and scheduling for summer session courses will differ significantly from those reported in the fall/winter Calendar. To determine the scheduling and hours for summer session classes, consult the class schedule at central.carleton.ca

Not all courses listed are offered in a given year. For an up-to-date statement of course offerings for the current session and to determine the term of offering, consult the class schedule at central.carleton.ca