

Industrial Design

This section presents the requirements for programs in:

- **Industrial Design B.I.D.**
- **Minor in Design**

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 for User Experience
IDES 2300 [0.5]	Projects IIA
IDES 2302 [0.5]	Projects IIB
IDES 2600 [0.5]	Human Factors/Ergonomics in Design
PSYC 3702 [0.5]	Perception

3. 1.0 credit in free electives	1.0
--	------------

Third Year

4. 2.0 credits in:	2.0
IDES 3310 [0.5]	Projects IIIA
IDES 3302 [0.5]	Projects IIIB
IDES 3502 [0.5]	Contextual Nature of Products
IDES 3601 [0.5]	Industrial Design and the User

5. 0.5 credit in:	0.5
BUSI 2204 [0.5]	Basic Marketing

6. 1.0 credit in free electives at the 2000-level or above	1.0
---	------------

7. 1.5 credits from:	1.5
IDES 3107 [0.5]	Design and Sustainability
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]	Advanced. Studies in Form and Colour
IDES 3305 [0.5]	Special Studies
IDES 3306 [0.5]	Special Studies

Fourth Year

8. 3.5 credits in:	3.5
---------------------------	------------

IDES 4001 [0.5]	Industrial Design Seminar	
IDES 4002 [0.5]	Professional Practice	
IDES 4301 [0.5]	Minor Projects A	
IDES 4310 [1.5]	Major Project	
IDES 4400 [0.5]	Internship Field Report	
9. 1.5 credits in free 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 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 chosen should serve to deepen the student's understanding of fields related to Industrial Design or disciplines that are relevant for industrial designers.

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 for User Experience

2. 2.5 credits from:	2.5
IDES 2600 [0.5]	Human Factors/Ergonomics in Design
IDES 3104 [0.5]	Exhibition Design
IDES 3105 [0.5]	Visual Communication and Package Design
IDES 3107 [0.5]	Design and Sustainability
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 satisfied.

Total Credits	4.0
----------------------	------------

Regulations

The regulations presented in this section apply to all students in the Bachelor of Industrial Design program.

In addition to the requirements presented here, students must satisfy the University regulations common to all undergraduate students including the process of

Academic Performance Evaluation (consult the Academic Regulations of the University section of this Calendar).

Year Status and General Prerequisites

In the Bachelor of Industrial Design degree program, year status is defined as follows:

1st year: Admission to the program.

2nd year: Successful completion of IDES 1001 , IDES 1301 and must not be deficient in any more than one of the other first year courses.

3rd year: Successful completion of of IDES 2302 and all first and second year course requirements.

4th year: Successful completion of IDES 3302 and all third year course requirements.

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

Academic Performance Evaluation for Bachelor of Industrial Design

1. Students in the Bachelor of Industrial Design degree are assessed at each Academic Performance Evaluation using their Overall CGPA and the Industrial Design Core courses. (The Industrial Design program does not distinguish a set of courses forming a Major).

The following evaluation criteria apply:

1. students are subject to an evaluation at the end of the winter term if they have completed 4.0 credits since admission or since the preceding evaluation;
2. in addition, students will receive an evaluation of their Industrial Design Core courses at the end of each Winter term as long as they have completed a Core course in the preceding summer, fall or winter terms.

INDUSTRIAL DESIGN CORE COURSES

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 3302 [0.5]	Projects IIIB
IDES 3310 [0.5]	Projects IIIA
IDES 4301 [0.5]	Minor Projects A

1. *Good Standing* - *Good Standing* requires a grade of C- or better in each of the Industrial Design Core courses as well as an Overall CGPA at or above the minimum given in Table 1 of Section 3.2.7.
2. *Academic Warning* - Students who are not assigned the status *Good Standing (GS)*, *Continue in Alternate (CA)* or *Dismissed from Program (DP)* will be on *Academic Warning*. The following conditions apply:

- a. a student who is on *Academic Warning* due to a grade less than C- in a Core course, but with an Overall CGPA high enough for *Good Standing* will be given permission to repeat this Core course and must achieve a grade of C- or better before the next evaluation.
 - b. a student who is on *Academic Warning* due to an Overall CGPA less than the minimum required for *Good Standing*, and who also has a grade less than C- in a Core course must raise both the Overall CGPA and pass the Core course with a grade of C- or better before the next evaluation. This student must first raise his or her Overall CGPA to a level sufficient to achieve *Good Standing*, if an evaluation were made, before permission will be given to re-register in the Core course.
3. *Continue in Alternate* or *Dismissed from Program* - Students satisfying any of the following conditions must leave the Industrial Design program with the status *Continue in Alternate (CA)* or *Dismissed from Program (DP)*:
 - a. have an Overall CGPA that is less than 1.00,
 - b. have failed to achieve a *Good Standing* assessment at the next Academic Performance Evaluation while on *Academic Warning*,
 - c. have exceeded the maximum allowable number of discredits for the program,
 - d. have failed to satisfy any additional course requirements received on admission,
 - e. have received a grade of less than C- in the same Core course twice,
 - f. have not completed the program within seven years.

Co-operative Education

For more information about how to apply for the Co-op program and how the Co-op program works please visit the Co-op website.

All students participating in the Co-op program are governed by the Undergraduate Co-operative Education Policy.

Undergraduate Co-operative Education Policy Admission Requirements

Students can apply to co-op in one of two ways; directly from high school or after beginning a degree program at Carleton.

If a student is admitted to co-op from high school, their grades will be reviewed two terms to one year prior to their first work term to ensure they continue to meet the academic requirements after their 1st or 2nd year of study. The time at which evaluation takes place depends on the program of study. Students will automatically be notified via their Carleton email account if they are permitted to continue.

Students not admitted to Carleton University with the co-op option on their degree can apply for admission via

the co-operative education program website. To view application deadlines, visit carleton.ca/co-op.

Admission to the co-op option is based on the completion of 5.0 or more credits at Carleton University, the CGPA requirement for the students' academic program as well as any course prerequisites. The articulated CGPA for each program is the normal standard for assessment. Please see the specific degree program sections for the unique admission and continuation requirements for each academic program.

English Language Proficiency

Students admitted to Carleton based on CAEL, IELTS or TOEFL assessments and who are required to take an ESL course must take and pass the Oral Proficiency in Communicative Settings (OPECS) Test. The test must be taken before being permitted to register in COOP 1000. Admission to the co-op program can be confirmed with a minimum score of 4+.

Participation Requirements

COOP 1000

Once a student has been given admission or continuation confirmation to the co-op option s/he must complete and pass COOP 1000 (a mandatory online 0.0 credit course). Students will have access to this course a minimum of two terms prior to their first work term and will be notified when to register.

Communication with the Co-op Office

Students must maintain contact with the co-op office during their job search and while on a work term. All email communication will be conducted via the students' Carleton email account.

Employment

Although every effort is made to ensure a sufficient number of job postings for all students enrolled in the co-op option of their degree program, no guarantee of employment can be made. Carleton's co-op program operates a competitive job search process and is dependent upon current market conditions. Academic performance, skills, motivation, maturity, attitude and potential will determine whether a student is offered a job. It is the student's responsibility to actively conduct a job search in addition to participation in the job search process operated by the co-op office. Once a student accepts a co-op job offer (verbally or written), his/her job search will end and access to co-op jobs will be removed for that term. Students that do not successfully obtain a co-op work term are expected to continue with their academic studies. The summer term is the exception to this rule. Students should also note that hiring priority is given to Canadian citizens for co-op positions in the Federal Government of Canada.

Registering in Co-op Courses

Students will be registered in a Co-op Work Term course while at work. The number of Co-op Work Term courses that a student is registered in is dependent upon the number of four-month work terms that a student accepts.

While on a co-op work term students may take a maximum of 0.5 credit throughout each four-month co-op work term.

Courses must be scheduled outside of regular working hours.

Students must be registered as full-time before they begin their co-op job search (2.0 credits). All co-op work terms must be completed before the beginning of the final academic term. Students may not finish their degree on a co-op work term.

Work Term Assessment and Evaluation

To obtain a Satisfactory grade for the co-op work term students must have:

1. A satisfactory work term evaluation by the co-op employer;
2. A satisfactory grade on the work term report.

Students must submit a work term report at the completion of each four-month work term. Reports are due on the 16th of April, August, and December and students are notified of due dates through their Carleton email account.

Workplace performance will be assessed by the workplace supervisor. Should a student receive an unsatisfactory rating from their co-op employer, an investigation by the co-op program manager will be undertaken. An unsatisfactory employer evaluation does not preclude a student from achieving an overall satisfactory rating for the work term.

Graduation with the Co-op Designation

In order to graduate with the co-op designation, students must satisfy all requirements for their degree program in addition to the requirements according to each co-op program (i.e. successful completion of three or four work terms).

Note: Participation in the co-op option will add up to one additional year for a student to complete their degree program.

Voluntary Withdrawal from the Co-op Option

Students may withdraw from the co-op option of their degree program during a study term ONLY. Students at work may not withdraw from the work term or the co-op option until s/he has completed the requirements of the work term.

Students are eligible to continue in their regular academic program provided that they meet the academic standards required for continuation.

Involuntary or Required Withdrawal from the Co-op Option

Students may be required to withdraw from the co-op option of their degree program for one or any of the following reasons:

1. Failure to achieve a grade of SAT in COOP 1000
2. Failure to pay all co-op related fees
3. Failure to actively participate in the job search process
4. Failure to attend all interviews for positions to which the student has applied
5. Declining more than one job offer during the job search process

6. Continuing a job search after accepting a co-op position
7. Dismissal from a work term by the co-op employer
8. Leaving a work term without approval by the Co-op manager
9. Receipt of an unsatisfactory work term evaluation
10. Submission of an unsatisfactory work term report

Standing and Appeals

The Co-op and Career Services office administers the regulations and procedures that are applicable to all co-op program options. All instances of a student's failure during a work term or other issues directly related to their participation in the co-op option will be reported to the academic department.

Any decision made by the Co-op and Career Services office can be appealed via the normal appeal process within the University.

International Students

All International Students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. It is illegal to work in Canada without the proper authorization. Students will be provided with a letter of support to accompany their application. Students must submit their application for their permit before being permitted to view and apply for jobs on the Co-op Services database. Confirmation of a position will not be approved until a student can confirm they have received their permit. Students are advised to discuss the application process and requirements with the International Student Services Office.

Bachelor of Industrial Design: Co-op Admission and Continuation Requirements

- Maintain full-time status in each study term (2.0 credits);
- Be eligible to work in Canada (for off-campus work)
- Have successfully completed COOP 1000 [0.0]

In addition to:

1. Registered as a full-time student in the Industrial Design program
2. Obtained a CGPA of 8.00 or higher in industrial design core courses and an overall CGPA of 6.50 or higher

Students in the Bachelor of Industrial Design must complete three (3) work terms to obtain the co-op designation.

Co-op Work Term Course: IDES 3999

Work-Study Pattern:

Year 1		Year 2		Year 3		Year 4		Year 5	
Term	Pattern	Term	Pattern	Term	Pattern	Term	Pattern	Term	Pattern
Fall	S	Fall	S	Fall	S	Fall	W	Fall	S
Winter	S	Winter	S	Winter	S	Winter	W/S	Winter	S
Summer		Summer	W	Summer	W	Summer	W/S		

Legend

S: Study

W: Work

O: Optional

* indicates recommended work study pattern

** student finds own employer for this work-term.

Admissions Information

Admission Requirements are for the 2019-20 year only, and are based on the Ontario High School System. Holding the minimum admission requirements only establishes eligibility for consideration. The cut-off averages for admission may be considerably higher than the minimum. See also the **General Admission and Procedures** section of this Calendar. An overall average of at least 70% is normally required to be considered for admission. Some programs may also require specific course prerequisites and prerequisite averages and/or supplementary admission portfolios. Higher averages are required for admission to programs for which the demand for places by qualified applicants exceeds the number of places available. The overall average required for admission is determined each year on a program by program basis. Consult admissions.carleton.ca for further details.

Note: Courses listed as *recommended* are not mandatory for admission. Students who do not follow the recommendations will not be disadvantaged in the admission process.

Degree

- Bachelor of Industrial Design (B.I.D.)

Admission Requirements

First Year

The Ontario Secondary School Diploma (OSSD) or equivalent including a minimum of six 4U or M courses. The six 4U or M courses must include Advanced Functions and Physics. Calculus and Vectors, Design Technology and Visual Arts are strongly recommended. Equivalent courses may be substituted between the old and new Ontario mathematics curriculum.

Note: candidates must present a portfolio of any kind of work that could demonstrate creativity and aptitude for the study of industrial design. Attending an information session at the School is recommended.

Advanced Standing

Applications for admission to second or subsequent years will be assessed on their merits and on space availability in the program. Advanced standing will be granted only for those courses that are determined to be appropriate and is subject to space availability.

Co-op Option

Direct Admission to the First Year of the Co-op Option

Applicants must:

1. meet the required overall admission cut-off average and prerequisite course average. These averages may be higher than the stated minimum requirements;
2. be registered as a full-time student in the Industrial Design program;

3. be eligible for work in Canada (for off-campus work placements).

Meeting the above requirements only establishes eligibility for admission to the program. The prevailing job market may limit enrolment in the co-op option.

Note: continuation requirements for students previously admitted to the co-op option and admission requirements for the co-op option after beginning the program are described in the Co-operative Education Regulations section of this Calendar.

Industrial Design (IDES) Courses

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, ambience and qualities of the object/context relationship, and design analysis from the perspective of the designer, the end-user and the environment.

Includes: Experiential Learning Activity

Also listed as ARCH 2101.

Prerequisite(s): IDES 1000 or 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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 1301.

Lecture and tutorials three hours a week.

IDES 2205 [0.5 credit]

Sensory Aspects of Design for User Experience

An exploration of multi-sensory qualities derived from and designed into products to optimize product-interaction experiences. Visual, tactile, auditory, and other related sensory aspects of design and design principles that contribute to the product multi-sensory characteristics while adding meaning and emotional value.

Includes: Experiential Learning Activity

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 design sketching used in the industrial design process. Topics include: sketching as a tool for problem definition; idea exploration and form development; rendering techniques and the communication of design concepts; basic physical prototyping and modeling-making techniques.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 2300 or permission of the School of Industrial Design.

Studio and lectures six hours a week.

IDES 2600 [0.5 credit]**Human Factors/Ergonomics in Design**

Foundation course in human factors/ergonomics providing an overview of physical and cognitive considerations in product design and related design fields. Anthropometrics, biomechanical considerations, cognition, social interaction, and emotional interaction are introduced in relation to supporting user experience, health and safety, performance and productivity.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 1301 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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 1301 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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 2105.

Lecture and tutorials three hours a week.

IDES 3107 [0.5 credit]**Design and Sustainability**

Explores the industrial designer's role in creating more environmentally and socially responsible products.

Addresses imperatives and drivers for integrating sustainability into products. Includes: sustainable design strategies, strategies and tools, sustainable design business case, circular economy model for designed products, and case studies.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 1301 or permission of the School of Industrial Design.

Lectures and tutorials three hours a week.

IDES 3202 [0.5 credit]**Advanced. 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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 2302 or permission of the School of Industrial Design.

Lecture and tutorials three hours a week.

IDES 3302 [0.5 credit]**Projects IIIB**

Introduction to the principles of innovation as found in industrial design. Invention, innovation, entrepreneurship, basic mechanisms. The design project(s) explore some or all of the design principles covered in the lectures.

Includes: Experiential Learning Activity

Precludes additional credit for IDES 3301 (no longer offered).

Prerequisite(s): IDES 3300 or IDES 3310 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 3310 [0.5 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.

Includes: Experiential Learning Activity

Precludes additional credit for IDES 3300 (no longer offered).

Prerequisite(s): IDES 2302 or permission of the School of Industrial Design.

Studio and lectures twelve hours a week.

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 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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 2600.

Lectures three hours a week, laboratory three hours a week.

IDES 3999 [0.0 credit]**Co-operative Work Term**

Includes: Experiential Learning Activity

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 4002 [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.

Precludes additional credit for IDES 3503 (no longer offered).

Prerequisite(s): IDES 3300 or IDES 3310 or permission of the School of Industrial Design.

Lectures and discussion 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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

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.

Includes: Experiential Learning Activity

Prerequisite(s): IDES 3300 or IDES 3310 or permission of the School of Industrial Design.

Tutorial hours arranged.