



**INTEGRATED PRODUCT DESIGN**  
*UNIVERSITY OF PENNSYLVANIA*

**Guidelines for Graduate Study**

***2022***

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***\*These guidelines are subject to change.***

## 1. INTRODUCTION

The University of Pennsylvania's Integrated Product Design program is intended to cultivate design professionals that possess both a breadth of knowledge and a depth of expertise in a specialty, to effectively bridge the domains of technology, manufacturing, business, aesthetics, and human-product interaction. The guiding philosophy of the program is to teach students to create innovative products and experiences and to understand and address the social, environmental and experiential contexts of those products so that product design can be harnessed as a force for the greater good.

The program builds the skills to investigate, imagine, conceptualize and model a wide range of products and their complementary business models. The program draws on the strengths of three internationally recognized schools within the University: The School of Engineering & Applied Science (SEAS), the Wharton School, and the Stuart Weitzman School of Design.

The graduate courses that make up the program are intended to create an interdisciplinary point of view and are taught by professors from all three disciplines. Studio classes accompany classroom studies, providing creative and analytical approaches, and shifting students between rigorous, technical and explorative processes in the development of both experiential and theoretical knowledge. Collaborative team projects and student-driven independent projects complement the core courses to give students both a solid grasp of the fundamentals and a deep understanding of the nuances of these fields.

The information presented in these Guidelines is not exhaustive; students should also obtain information from the [Penn Engineering website](#).

More information, updated periodically, on the IPD program is also available on the website, [ipd.me.upenn.edu](http://ipd.me.upenn.edu). Reading all the rules and procedures is essential to be familiar with various degree requirements and the plentiful opportunities that are available.

These guidelines together with the information presented on the above listed websites will answer most questions. Advice and answers to questions not covered in these sources may be obtained from the Director<sup>1</sup>, Executive Director<sup>2</sup> or Administrative Director<sup>3</sup>.

*\* Students who matriculated before July 2022 are subject to the policies that were in effect as of their matriculation date.*

## 2. PROGRAM ADVISING

The first person with whom a new student will have contact with will be an assigned faculty academic advisor. A program of study is developed with the faculty advisor and in accordance with these guidelines. Students are required to meet with their faculty advisor prior to registering for coursework each semester. It is encouraged that students communicate with their faculty advisor outside of course registration as well. In addition to the faculty advisor, the Director, Executive Director, and the Administrative Director of the IPD program are resources students may interact with for degree progress guidance. Together, these people are responsible for monitoring the student's academic plan and progress during the IPD Master's program.

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### 3. DEGREE REQUIREMENTS

To achieve a Master’s of Integrated Product Design (M:IPD) or a Master’s of Science in Engineering Integrated Product Design (MSE:IPD) the requirements consist of a total of ten courses (not including foundation courses), seven of which must be from within the School of Engineering and Applied Science. Detailed curriculum requirements for each degree track is given below. The degree requirement also includes four sequential credits of studio work that must be taken in order over the course of four semesters. In accordance with SEAS policy, “No grade lower than a ‘C-’ will be counted in courses designated as ‘core’ courses or those courses must be retaken.” Since this program is cross-disciplinary, students who do not have the applicable foundation in each of the three areas, engineering, design arts, and business, may be required to enroll in foundation courses in these areas. Foundation courses must be taken in the first year of study and a grade of “B-” or better must be earned to satisfy the foundation requirement. If a student is unsuccessful in earning the grade of “B-” or better in a required foundation course, they will be required to take an additional course in which the grade of “B-” must be earned to graduate. This course will be determined by the student and the Academic Advisor.

<b><u>Foundation Courses for both the M:IPD &amp; MSE:IPD</u></b> 0-3 CUs or proficiency shown	
Engineering Basics	IPD 5000 – Product Engineering Basics (1 CU)
Design Basics	IPD 5030 – Design Fundamentals (1 CU)
Business Basics	EAS 5450 – Engineering Entrepreneurship I (1 CU) or MKTG 1010 – Introduction to Marketing (1 CU)
<i>Students wishing to take a course other than the above to satisfy the foundation requirement must obtain course approval from the Director or Executive Director.</i>	

<b><u>Curriculum for M:IPD Program</u></b> 10 CU + 2 Semesters of Seminar	
<b>Core Courses (5 CU)</b>	
	IPD 5140 – Design for Manufacturability (1 CU) <b>OR</b> IPD 5150 – Product Design (1 CU) (1 <sup>st</sup> year)
	IPD 5510 – Design Process (1 <sup>st</sup> Semester) (1 CU)
	IPD 5520 – Problem Framing (2 <sup>nd</sup> Semester) (1 CU)
	IPD 7990 – Final Project (3 <sup>rd</sup> Semester) (1 CU)
	IPD 7990 – Final Project (4 <sup>th</sup> Semester) (1 CU)
<b>Engineering Breadth (1 CU)</b>	
	BE 5140 – Rehab Engineering & Design (1 CU)
	CIS 5190 – Applied Machine Learning (1 CU)
	CIS 5450 – Big Data Analytics (1 CU)
	CIS 5570 – Programming for the web (1 CU)
	CIT 5900 – Programing Language and Technique (1 CU)
	ESE 5160 – IoT Edge Computing (1 CU)
	ESE 5450 – Data Mining: Learning from Massive Datasets (1 CU)

	IPD 5010 – Integrated Computer-Aided Design, Manufacturing and Analysis (1 CU)
	IPD 5140 – Design for Manufacturability (1 CU)
	IPD 5160 – Advanced Mechatronics in Reactive Spaces (1 CU)
	IPD 5190 (ESE 5190) – Introduction to Embedded Systems (1 CU)
	IPD 5290 – Designing Connected Objects and Experiences (1 CU)
	MEAM 5080 – Materials and Manufacturing for Mechanical Design (1 CU)
	MEAM 5100 – Design of Mechatronic Systems (1 CU)
	MEAM 5200 – Introduction to Robotics (1 CU)
	or comparable approved by the Director
<b>Design Breadth (1 CU)</b>	
	ARCH 7240 – Technology in Design (1 CU)
	ARCH 7260 – Furniture Design as Strategic Process (1 CU)
	ARCH 7270 (IPD 5270) – Industrial Design I (1 CU)
	ARCH 7280 (IPD 5280) – Design of Contemporary Products: Design for Equity, Inclusion and Accessibility (1 CU)
	ARCH 7320 – Principles of Digital Fabrication (1 CU) *Only Prof. Avery’s section is preapproved.
	ARCH 7370 – Semi-Fictitious Realms (1 CU)
	ARCH 7390 – New Approaches to an Architecture of Health (1 CU)
	ARCH 7430 – Form and Algorithm (1 CU)
	ARCH 7440 (IPD 5440) – Postdigital Craft (1 CU)
	ARCH 7510 – Ecology, Technology, and Design (1 CU)
	CPLN 5710 – Sensing the City (1 CU)
	DSGN 5001 – Art, Design, and Digital Culture (1 CU)
	DSGN 5002 – Design 21: Design After the Digital Age (1 CU)
	DSGN 5004 – Art of the Web: Interactive Concepts for Art & Design (1 CU)
	DSGN 5005 – 3-D Computer Modeling (1 CU)
	DSGN 5007 – Typography (1 CU)
	DSGN 5013 – Graphic Design Practicum (1 CU)
	DSGN 5016 – Cultures of Making (1 CU)
	DSGN 5017 – Biological Design (1 CU)
	DSGN 5018 – Graphic Design I: Creative Technologies (1 CU)
	DSGN5019 – Functions for Form and Material (1 CU)
	DSGN 5021 – Information Design & Visualization (1 CU)
	DSGN 5022 – Interfacing Cultures: Designing for Mobile, Web & Public Media (1 CU)
	DSGN 5023 – User Experience (UX) and User Interface (UI) Design (1 CU)
	IPD 5110 – How to Make Things: Production Prototyping Studio (1 CU)
	IPD 5210 – Designing Smart Objects for Play and Learning (1 CU)
	IPD 5270 – Industrial Design I (1 CU)
	IPD 5680 – Integrative Design Studio: Biological Design (1 CU)
	MEAM 5160 (IPD 5160) – Advanced Mechatronics in Reactive Spaces (1 CU)
	IPD 5680 (DSGN5017) – Biological Design (1 CU)
	Or comparable approved by the Director
<b>Business Breadth (1 CU)</b>	
	BDS 5010 – Behavioral Science: Theory and Application of Experimental Methods (1 CU)

BDS 5120 – Power, Pers. & Influence (1 CU)
BDS 5210 – Judgments & Decisions (1 CU)
EAS 5120 – Engineering Negotiation (1 CU)
***EAS 5450 – Engineering Entrepreneurship I (1 CU)
EAS 5460 – Engineering Entrepreneurship II (1 CU)
EAS 5490 – Engineering Entrepreneurship Lab (1 CU)
ENVS 6530 – Corporate Sustainability Strategies (1 CU)
ESE 5400 – Engineering Economics (1 CU)
FNCE 7500 – Venture Capital and the Finance of Innovation (1 CU)
HCMG 8530 – Management and Strategy in Medical Devices (1 CU)
HCMG 8670 – Health Care Entrepreneurship (0.5 cu)
MGMT 7290 – Intellectual Property Strategy for the Innovation-Driven Enterprise (0.5 CU)
MGMT 7310 – Technology Strategy (1 CU)
MGMT 8010 – Entrepreneurship (0.5 CU)
MGMT 8020 – Innovation, Change & Entrepreneurship (0.5 CU)
MGMT 8040 – Venture Capital and Entrepreneurial Management (0.5 CU)
MGMT 8060 – Venture Implementation (1 CU)
MGMT 8120 – Social Entrepreneurship (0.5 CU)
MKTG 6110 – Marketing Management (0.5 CU)
MKTG 6120 – Dynamic Marketing Strategy (0.5 CU)
MKTG 7110 – Consumer Behavior (1 CU)
MKTG 7120 – Data and Analysis for Marketing Decisions (1 CU)
MKTG 7210 – New Product Management (0.5 CU)
MKTG 7270 – Digital Marketing and Marketing and Electronic Commerce (0.5 CU)
MKTG 7330 – Marketing for Social Impact (1 CU)
MKTG 7370 – Introduction to Brian Science for Business (1 CU)
MKTG 7410 – Entrepreneurial Marketing (1 CU)
MKTG 7700 – Digital Marketing, Social Media and E-Commerce (1 CU)
MKTG 7760 – Applied Probability Models in Marketing (1 CU)
MKTG 8090 – Special Topics: Experiments for Business Decision Making (1 CU)
MKTG 8500 – Special Topics: Consumer Neuroscience (0.5 - 1 CU)
NPLD 5850 – Social Impact Lab (1 CU)
NPLD 5870 – Interpersonal Dynamics In Nonprofits That Thrive (1 CU)
NPLD 7820 – Small Group Processes (1 CU)
NPLD 7850 – Group Dynamics and Organizational Politics (1 CU)
NPLD 7860 – Strategic Management and Leadership of Nonprofits
NPLD 7870 – Leadership Theory and Practice
OIDD 6120 – Business Analytics (1 CU)
OIDD 6140 – Innovation (0.5 CU)
OIDD 6620 – Enabling Technologies (1 CU)
OIDD 6910 – Negotiations (1 CU)
Or comparable approved by the Director
<b>Elective (2 CU)</b> Two additional graduate level courses in either engineering, design, business or independent study or another area pertinent to the individual’s specific area of interest or study. Electives should be chosen from the breadth lists above, from the elective list below or with advisor approval.

	IPD 5090 – Need Finding (1 CU)
	IPD 5250 – Ergonomics/Human Factors Based Product Design (1 CU)
	Or comparable approved by the Director
<b>Seminar (2 CU)</b> Two semesters of IPD 6990 IPD Seminar. There is no tuition or fees for IPD 6990 and this course does not count towards full time status.	

<b>Curriculum for MSE:IPD Program</b> <b>10 CU + 2 Semesters of Seminar</b>	
<b>Core Courses (6 CU)</b>	
	IPD 5140 (MEAM 5140) – Design for Manufacturability (1 CU)
	IPD 5510 – Design Process (1 <sup>st</sup> Semester) (1 CU)
	IPD 5520 – Problem Framing (2 <sup>nd</sup> Semester) (1 CU)
	IPD 7990 – Final Project (3 <sup>rd</sup> Semester) (1 CU)
	IPD 7990 – Final Project (4 <sup>th</sup> Semester) (1 CU)
	MEAM 5100 – Design of Mechatronic Systems (1 CU)
<b>Engineering Breadth (2 CU)</b>	
	BE 5140 (IPD 5140) – Rehab Engineering & Design (1 CU)
	CIS 5190 – Applied Machine Learning (1 CU)
	CIS 5450 – Big Data Analytics (1 CU)
	CIS 5570 – Programming for the Web (1 CU)
	CIS 5610 – Advanced Computer Graphics (1 CU)
	CIT 5900 – Programing Languages and Techniques (1 CU)
	ESE 5160 – IoT Edge Computing (1 CU)
	ESE 5450 – Data Mining: Learning from Massive Datasets (1 CU)
	IPD 5010 – Integrated Computer-Aided Design, Manufacturing, and Analysis (1 CU)
	IPD 5160 (MEAM 5160) – Advanced Mechatronics in Reactive Spaces (1 CU)
	IPD 5250 – Ergo/Human Fac. Based Product Design (1 CU)
	IPD 5290 – Designing Connected Objects and Experiences (1 CU)
	MEAM 5080 – Materials and Manufacturing for Mechanical Design (1 CU)
	MEAM 5200 – Introduction to Robotics (1 CU)
	MEAM 5270 – Finite Element Analysis (1 CU)
	MEAM 5350 – Advanced Dynamics (1 CU)
	Or comparable approved by the Director
<b>Design Arts Breadth (1 CU)</b>	
	ARCH 7240 (IPD 5210) – Technology in Design (1 CU)
	ARCH 7260 – Furniture Design Strategic Process (1 CU)
	ARCH 7320 – Principles of Digital Fabrication (1 CU) *Only Prof. Avery’s section is preapproved.
	ARCH 7370 – Semi-Fictitious Realms (1 CU)
	ARCH 7390 – New Approaches to an Architecture of Health (1 CU)
	ARCH 7420 – Function of Fashion in Architecture (1 CU)
	ARCH 7430 – Form and Algorithm (1 CU)
	ARCH 7510 – Ecology, Technology, and Design (1 CU)
	CPLN 5710 – Sensing the City (1 CU)

DSGN 5001 – Art, Design, and Digital Culture (1 CU)
DSGN 5002 – Design 21: Design After the Digital Age (1 CU)
DSGN 5004 – Art of the Web: Interactive Concepts for Art & Design (1 CU)
DSGN 5007 – Typography (1 CU)
DSGN 5013 – Graphic Design Practicum (1 CU)
DSGN 5016 – Cultures of Making (1 CU)
DSGN 5017 – Biological Design (1 CU)
DSGN 5018 – Graphic Design 1: Creative Technologies (1 CU)
DSGN 5021 – Information Design and Visualization (1 CU)
DSGN 5022 – Interfacing Cultures: Designing for Mobile, Web & Public Media (1 CU)
DSGN 5023 – User Experience (UX) and User Interface Design (UI) (1 CU)
IPD 5110 – How to Make Things: Production Prototyping Studio (1 CU)
IPD 5160 (MEAM 5160) – Advanced Mechatronics in Reactive Spaces (1 CU)
IPD 5210 (ARCH 7210) – Designing Smart Objects for Play and Learning (1 CU)
IPD 5270 (ARCH 7270) – Industrial Design I (1 CU)
IPD 5280 (ARCH 7280) – Design of Contemporary Products: Design for Equity, Inclusion and Accessibility (1 CU)
IPD 5440 (ARCH 7440) – Postdigital Craft (1 CU)
Or comparable approved by the Director
<b>Business Breadth (1 CU)</b>
BDS 5010 – Behavioral Science: Theory and Application of Experimental Methods (1 CU)
BDS 5120 – Power, Persuasion and Influence (1 CU)
BDS 5210 – Judgments & Decisions (1 CU)
EAS 5120 – Engineering Negotiation (1 CU)
***EAS 5450 – Engineering Entrepreneurship I (1 CU)
EAS 5460 – Engineering Entrepreneurship II (1 CU)
EAS 5490 – Engineering Entrepreneurship Lab (1 CU)
ENVS 6530 – Corporate Sustainability Strategies (1 CU)
ESE 5400 – Engineering Economics (1 CU)
FNCE 7500 – Venture Capital and the Finance of Innovation (1 CU)
HCMG 8670 – Health Care Entrepreneurship (0.5 CU)
MGMT 7290 – Intellectual Property Strategy for the Innovation – Driven Enterprise (0.5 CU)
MGMT 7310 – Technology Strategy (1 CU)
MGMT 8010 – Entrepreneurship (0.5 CU)
MGMT 8020 – Change, Innovation & Entrepreneurship (0.5 CU)
MGMT 8040 – Venture Capital and Entrepreneurial Management (0.5 CU)
MGMT 8060 – Venture Implementation (1 CU)
MGMT 8120 – Social Entrepreneurship (0.5 CU)
MKTG 6110 – Marketing Management (0.5 CU)
MKTG 6120 – Dynamic Marketing Strategy (0.5 CU)
MKTG 7110 – Consumer Behavior (0.5-1 CU)
MKTG 7120 – Data and Analysis for Marketing Decisions (1 CU)
MKTG 7210 – New Product Management (0.5 CU)
MKTG 7270 – Digital Marketing and Electronic Commerce (0.5 CU)
MKTG 7370 – Introduction to Brian Science for Business (1 CU)
MKTG 7410 – Entrepreneurial Marketing (0.5 CU)
MKTG 7700 – Digital, Social and E-Commerce Marketing (1 CU)
MKTG 7760 – Applied Probability Models in Marketing (1 CU)

NPLD 5850 – Social Impact Lab (1 CU)
NPLD 5870 – Interpersonal Dynamics In Nonprofits That Thrive (1 CU)
NPLD 7820 – Small Group Processes (1 CU)
NPLD 7850 – Group Dynamics and Organizational Politics (1 CU)
NPLD 7860 – Strategic Management and Leadership of Nonprofits
NPLD 7870 – Leadership Theory and Practice
OIDD 6120 – Business Analytics (0.5)
OIDD 6140 – Innovation (0.5 CU)
OIDD 6150 – Operations Strategy (0.5 CU)
OIDD 6520 – Design and Development of Web-Based Products and Services (0.5 CU)
OIDD 6620 – Enabling Technologies (0.5-1 CU)
Or comparable approved by the Director

### Notes

\* *If a course is cross-listed, students must register for the IPD section when available.*

\*\* *Any deviation from the above must be approved by the Director.*

\*\*\* *EAS 545 cannot be counted towards both the foundation and business breadth.*

## **4. ATTENDANCE AT SEMINARS AND PROJECT PRESENTATIONS**

The attendance of all full-time graduate students at IPD seminars and final presentations is mandatory. There are many good reasons why students should attend departmental seminars and presentations even when the seminars are not directly linked to their areas of research. For example:

- They provide an opportunity to learn about the state-of-the-art companies, designs, technologies, ideas, etc.
- They provide an opportunity for the student to get acquainted with people from other institutions and companies and get an inside view of their culture and ideas. On more than one occasion, during job interviews, interviewers have been known to mention a visit to Penn and delivering a seminar.
- They are meaningful simply to learn what new and interesting things are going on in the world.
- They are an excellent opportunity to get together as a department. It is hoped that a full attendance at these seminars will help create departmental spirit and cohesiveness.

### Seminar Course IPD 6990

The seminar course has been established so that students are recognized for their seminar attendance as well as to encourage students to attend. There are no quizzes, tests, or homework. There is also NO tuition charged for IPD 6990. The course is graded S/U and does not count towards full-time enrollment status. To obtain a satisfactory (S) grade, the student must attend the IPD seminars. To obtain their degree, IPD students are required to accumulate 2 seminar course credits (IPD 6990). EAS 8960 Professional Career Development may be used to substitute one unit/semester of IPD 6990. EAS 8960 002 (002 is IPD's section number) is typically offered only in the fall semester and is appropriate for master's students in their second year (third semester) of study. There is a fee associated with registering for EAS 8960 002. Under special circumstances, e.g., in a case of a conflict with a course offering, the student may waive the seminar requirement for that particular semester by petitioning the Director. Part-time students are exempted from the mandatory overall seminar attendance requirement although they are strongly encouraged to attend all possible seminars. Submatriculant/Accelerated Master's students are full-time and therefore must accumulate 2 seminar course credits prior to graduation.

## 5. GENERAL INFORMATION

### Registration:

All students enrolled in a degree program are required to be continuously registered. Three courses per semester (including studio project research, such as IPD 7990 Final Project and IPD 5990 Independent Study) is a normal full-time load for all students. The seminar course, IPD 6990, does NOT count towards full-time status. EAS 8960 does count towards full-time status. Students must always consult with the Director or Executive Director if a deviation from the normal load is desired or being contemplated. Students must meet with their advisor to discuss course selection and obtain advisor's sign-off prior to registration.

### Leaves of Absence:

Continuous registration as a graduate student is required unless a formal leave of absence is granted by the Dean of the student's school. A Leave of Absence (LOA) may be requested by submitting a request via <https://grad.seas.upenn.edu/student-handbook/forms/>. More detailed information regarding LOA is available in the [SEAS Graduate Student Handbook](#).

### Obsolescence:

The maximum time allowed for the completion of all master's degree requirements is seven years. Course units that are older than seven years may not be counted toward the degree requirements.

### Changes in Course Program:

Students may add or drop courses without penalty during a semester if it is done by the deadline listed in the current graduate bulletin. The Director or Executive Director must be informed of the student's decision beforehand and must receive their approval. International students must consult with the office of International Student and Scholar Services (ISSS) before dropping a course.

### Grades, Credits, and Academic Standing:

The grading system is as follows: A (4.0), Excellent; B (3.0), Good; C (2.0), Fair; D (1.0), Poor; F (0.0), Failure. A course in which an F was obtained must be taken again; however, the F will remain on the student's transcript. Courses for which a passing grade was obtained cannot be retaken for credit. An incomplete (I) or a no report (NR) are temporary notations and students are allowed a period of one semester to clear them from their transcripts. Failure to clear an "incomplete" or "no report" within the allotted time will result in an automatic grade of F. *No students will be permitted to graduate if there are any Incomplete, Unsatisfactory, or No Report notations on their records.*

M:IPD and MSE:IPD students in the School of Engineering are expected to maintain at least a B- average (2.7) in their work. A student whose record falls below a B- average will be put on academic probation and may be required to withdraw; graduation requires a minimum of a B- average.

### Academic Integrity

Each student is expected to abide by Penn's [Code of Academic Integrity](#). Students should not knowingly use any dishonest method to gain an unfair advantage over other students in academic pursuits, especially through, but not limited to:

- Giving or receiving any unauthorized aid on an assignment or exam, including working in groups on any assignment that has been designated as individual by the professor;
- Misrepresenting the originality of one's work (plagiarism), particularly through direct copying of work and through failing to note the contributions of others, except as permitted by the instructor;

- Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor.

If there is any doubt as to what is permissible, it is the student's responsibility to ask the instructor. Students caught cheating will be subject to disciplinary action, which may include referral to the Office of Student Conduct. For more information, please see the [Student Guide on Academic Integrity](#).

## **6. INDEPENDENT STUDY**

Independent Study courses (IPD 5990) are vehicles to accommodate special interests of the students which are not served through the regular courses. They create opportunities for mini-projects and a mentoring relationship between the student and the faculty. IPD 5990 can only be counted towards the elective requirement and must be a topic independent of your final project work.

Since independent studies are less structured than regular courses and typically do not come with strict deadlines, occasionally students tend to fall behind in their work. There is also the possibility of miscommunication between the student and the faculty on the objectives, extent, scope, and the grading method for the independent study. The purpose of this policy is to set the rules for an independent study with the objectives of maintaining academic rigor and minimizing any potential for miscommunication.

An independent study course should require effort comparable to that of a regular course, about 9 hours a week or a total of 126 hours per semester. The student should meet the faculty member administering the independent study (the advisor) on a regular basis, at least once a week. It is the student's responsibility to schedule these weekly meetings. Experience indicates that failure to maintain regular contact with the student's advisor can lead to a less than satisfactory performance in the independent study course. In the absence of regular contact, the student stands the risk of not being focused leading to an impression of dereliction. The key to a successful independent study is a steady effort throughout the semester. The student should not expect to be able to cram a semester's work into a few days of intensive work at the end of the semester.

Prior to the beginning of the semester in which the student contemplates taking the independent study, the student and their advisor should develop a brief document. The first paragraph of the document should describe the objectives, scope, and content of the independent study. The second paragraph should state how the independent study will be evaluated and how the student will be graded. The document should be signed by both the student and their advisor, and it should be submitted to the program Director for approval before the beginning of the semester.

At the end of the independent study, the student should prepare a brief report specifying what material was covered during the independent study, those objectives that were met and those that were not. If objectives were not met, a clear explanation should be provided as to why such objectives were not met.

It is the student's responsibility to make sure that these guidelines are followed. Failure to follow these guidelines may result in the student not receiving credit for the independent study.

## **7. POLICY ON TRANSFER OF CREDIT UNITS EARNED IN OTHER INSTITUTIONS**

IPD students may apply to obtain credit for up to two approved graduate courses taken at another institution. These courses are referred to as transfer courses. For on campus programs, courses taken under a certificate program, study abroad, or online are not allowed and they will not be reviewed or considered for transfer. Per University policy, courses counted towards an undergraduate degree will not be considered for graduate

credit unless in an approved and awarded submatriculation/accelerated master's program. Transfer credit must be taken prior to matriculation at Penn. Courses are held to a time limit of five (5) years (<https://grad.seas.upenn.edu/student-handbook/academic-options/#transfer>). Dual Degree and Submatriculant/Accelerated Master's students who are double counting courses towards both degrees will not be permitted to transfer courses in addition to double counting courses. Transfer courses must be graduate level courses in which at least a B grade has been earned. To obtain credit for courses taken at other institutions, the following procedure must be followed:

- For each transfer course, obtain information about the, e.g. course description, syllabus, homeworks and/or exams and the title of the textbook prescribed for the course.
- Identify a professor who teaches a similar course at Penn. If a similar course is not offered at Penn, identify a professor whose areas of expertise are in the general area of the course to be transferred. The professor should certify that the course is of similar level to a graduate course offered at Penn or, if a similar course is not offered at Penn, that the course qualifies for Penn students to take at the graduate level if it were offered here.
- Submit a petition via [XCAT](#).

## **8. FINAL PROJECT**

The IPD Final Project is the output of two semesters of interdisciplinary master's study combining engineering, design arts and business. In keeping with the nature of this unique major, every student aims to have a committee of advisors that include three different disciplines. This section is intended to help set the expectations of work on the part of the advisors and students.

### **Final Project Expectations**

A viable IPD Project should include the following elements or qualities:

- Be a holistic offering, explicitly addressing design, engineering and business elements
- Solve a real problem in the world
- Be both commercially viable and socially valuable
- Be innovative: either entirely new to the world, a fundamental improvement on something that exists, or something that is translated from one domain to another in a new way
- Be user-centered
- Be prototyped for the purposes of evaluation and iteration
- Be developed and prototyped to the fullest extent possible
- Contribute to the discourse on product design

In addition to the aforementioned requirements, students who pursue the MSE:IPD degree track (Master's of Science in Engineering) of the IPD program will be expected to complete final projects that demonstrate engineering knowledge and expertise, including the ability to implement the technology of the product, innovation in the technology of the products, the ability to fabricate the product, analysis of engineering performances, iteration and improvements of the product based on that analysis.

### **Team projects**

Interdisciplinary group work is a cornerstone of the program. We expect IPD Final Projects to be team projects. Ideally teams will be formed by two or three students from different backgrounds. The expected work and contributions from each member should be clearly delineated when teams form and on an ongoing basis.

Students will work together on one project, however they will submit separate project proposal (with shared text) but with emphasis on their respective parts of the work.

More detail about the Final Project expectations will be provided in the course syllabus.

## 9. SUBMATRICULATION/ACCELERATED MASTER'S

Outstanding undergraduate students at the University may apply for Submatriculation/Accelerated Master's (Fall 2018 undergraduate matriculation or later) for either of the IPD master's degree programs and take graduate-level courses as electives during their senior year. After fulfilling the requirements of both programs, the student will receive a BSE and a MSE:IPD or a BSE and a M:IPD degree. Undergraduates at the University of Pennsylvania may double-count up to three graduate level courses taken while enrolled as a submatriculant/accelerated master's towards both the undergraduate and the graduate degrees. If studio work is begun before the end of the senior year (taking IPD 551 in the fall and IPD 552 in the spring), the degree may be completed in two extra semesters of study. To complete both degrees in only five years, students can consider:

- Taking the foundation courses during the undergraduate program.
- Take two extra graduate-level courses (cannot be counted towards the BSE degree) during the undergraduate program.
- Take two of the four IPD studio classes (IPD 5510 and IPD 5520) in the 4<sup>th</sup> (senior undergraduate) year.

Students enrolled as a submatriculant/accelerated master's can only count graduate courses taken at Penn towards the master's degree. No transfer credit, study abroad, or study away courses will be accepted.

Applications to the program must be completed by the February 1<sup>st</sup> deadline and before the end of the junior year. Submatriculation/Accelerated Master's applications are available online via the [Penn Engineering website](#).

## 10. DUAL DEGREE PROGRAMS

Students may apply to a dual degree program and receive an M:IPD or MSE degree in Integrated Product Design and any of the other disciplines in the Engineering School such as Electrical and Systems Engineering, Bioengineering, Computer Science, Chemical and Biomolecular Engineering, and Materials Science Engineering if admitted. The dual degree program requires the completion of at least 16 courses (not including foundation courses) and satisfaction of the degree requirements of each department in which the student wishes to major. To enroll in this program, the student must complete an [application form](#), list the course plan for both programs and obtain the approval from the Director/Graduate Group Chair of each department.

A dual degree is also offered with the Stuart Weitzman School of Design (Architecture) and the Wharton School. Students must satisfy independent admission requirements for the School of Engineering, The Wharton School of Business and the Stuart Weitzman School of Design (Architecture). This means that the appropriate standardized tests, such as the GRE, GMAT or MCAT, a completed application form and fee, transcript, and recommendations, must be sent to each school independently. Dual degree students can double count up to three courses towards both programs. However, seven course units taken only for the IPD degree must be within Engineering.

Please contact the appropriate School for more information about specific application and degree requirements.

## **11. SUMMER STUDIES**

There are several possibilities for scholarly activities by graduate students at the University during the summer, including:

- Independent study (IPD 5990) with an instructor willing to act as a supervisor during the summer.
- Course work outside SEAS, as well as a limited number of regular courses occasionally offered by some SEAS departments. The Director must approve summer school courses.

## **12. RECORDS**

The official graduate student records are kept in the Research and Academic Services office; transcripts can be viewed on [Path@Penn](mailto:Path@Penn). Graduate students are encouraged to periodically check the accuracy of their records and to bring any discrepancies to the attention of the Director.