Penn
Integrated Product Design

Graduate Handbook

2026

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Penn Engineering
Integrated Product Design
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*** This handbook reflects policies and requirements in effect at the time of publication.**

1. INTRODUCTION

Penn's Integrated Product Design program trains students to work across design, engineering, and business; developing both broad competency and deep specialization to create products that are functional, manufacturable, and human-centered. The program's guiding philosophy is that great product design addresses the social, environmental, and human contexts in which products exist, and can serve as a force for the greater good.

Students build skills across the full arc of product development: investigating opportunities, generating concepts, prototyping solutions, and developing the business models that bring products to market. Drawing on the combined strengths of faculty and institutions from across the University of Pennsylvania, the program bridges disciplines that are too often siloed.

Graduate coursework is taught by faculty from all three disciplines and is designed to develop an integrative, cross-disciplinary perspective. Studio courses run alongside classroom instruction, moving students between rigorous technical work and open-ended exploration to build both theoretical foundations and hands-on capability. Collaborative team projects and independent student work are central to the curriculum, ensuring graduates leave with a firm grasp of fundamentals and a nuanced understanding of what it takes to design products that endure.

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 IPD's website. 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[1], Executive Director[2] or Administrative Director[3].

* *Students who matriculated before August 2026 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.

[1] Dr. Mark Yim, Room 229-A Towne Bldg. (215-898-5269; yim@grasp.cis.upenn.edu)
[2] Sarah Rottenberg, Room 407 Tangen Hall (srot@design.upenn.edu)
[3] Maryeileen B. Griffith, Room 406 Tangen Hall (215-898-2826; mebg@seas.upenn.edu)

3. DEGREE AND CERTIFICATE OVERVIEW

The Integrated Product Design program offers three academic offerings: the Master of Integrated Product Design (M:IPD), the Master of Science in Engineering in Integrated Product Design (MSE:IPD), and the IPD Certificate. The table below summarizes the general curricular structure of each offering. Detailed curriculum requirements are provided in the sections that follow.

Curriculum Requirements by Program			
Requirement	**M:IPD**	**MSE:IPD**	**Certificate**
Foundation Courses*	0-3	0-3	Not Required
Total Program Courses	**10**	**10**	**5**
Core Courses	5	6	2
Business Breadth	1	1	1
Design Breadth	1	1	1
Engineering Breadth	1	2	1
Electives	2	0	0
Seminar Requirement	2 Semesters	2 Semesters	Not Required

*Students may be required to complete up to three foundation courses depending on prior academic background.

4. DEGREE PROGRAM 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), students must complete a total of ten courses (not including foundation courses). Detailed curriculum requirements for each degree track are 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' or those courses must be retaken.

Since this program is cross-disciplinary, students who do not have the applicable foundation in engineering, design, and business may be required to enroll in foundation courses in those 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, the student will be required to take an additional course in which the grade of "B-" or better must be earned to graduate. This course will be determined by the student and the Faculty Academic Advisor.

Students who take EAS/IPD 5450 Engineering Entrepreneurship I as a foundation course and earn an A- or higher will automatically receive a waiver for the business foundation course requirement and may count this course towards their business breadth or as an elective for the M:IPD degree.

Below is a list of courses that will count towards your degree, highlighting which courses count towards different degree requirements, provided students are eligible to enroll. Students may petition to have courses count towards their degree that are not listed below, as course offerings are continually evolving.

The IPD leadership team does our best to stay informed about courses being taught across the University. However, new courses are continually being offered, and some courses may make sense for a particular student but not for all students. Because of this, the program maintains a petition system through which students may request that a course count towards a particular requirement.

As you petition, keep in mind the following:

Core courses bring multiple perspectives together for the purpose of understanding and applying core content through design. They tend to involve teaching students how to explore opportunity spaces, propose new solutions, and **integrate** knowledge from all three disciplines.

Engineering courses are courses that focus on technical problem solving and the development of technical skills. They might include the integration of theory and practice. Even though non-engineering courses might teach some technical skills, they can only be counted as Engineering courses if they are offered in Penn Engineering and focus on building engineering capabilities. There are some courses in Penn Engineering that are focused on building engineers' skill sets beyond engineering. Those don't typically count as engineering courses.

Design courses are courses that focus on creativity, innovation and the development of design skills including sketching, prototyping, digital design tools and understanding materials. Most design courses are offered within the Weitzman School of Design, but not all courses within Weitzman qualify as design courses for the IPD degree. Additionally, even if a course in Weitzman teaches the use of technology, like programming languages, it is with a design orientation and for the purpose of exploring implementations and therefore will count as a design course.

Business courses are courses that focus on teaching skills and concepts related to the operation, management and strategy of organizations and marketing of their products and services. They might include a focus on developing analytic skills and using analytic tools for decision making. Business courses might also focus on teaching skills to navigate interpersonal relationships and organizational structures, focusing on topics like communication, negotiation, teamwork and leadership. Business courses can be found in the Wharton School of Business but also in Penn Engineering, in the Non-profit Leadership program, the Law school and the Behavioral Science and Data analytics program.

Foundation Courses for both the M:IPD & MSE:IPD 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)
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.	

Curriculum: M:IPD Degree Program 10 CU + 2 Semesters of Seminar	
Core Courses (5 CU)	
	Choose one of the following courses (1 CU) in your first year: IPD 5110 – Fabrication Studio I (1 CU) **OR** MEAM 5140 – Design for Manufacturability (1 CU) **OR** IPD 5150 – Product Design (1 CU) **OR** ESE 5430 – Human Systems Engineering (1 CU) **OR** CIS 5120 – Introduction to Human Computer Interaction (1 CU)
	IPD 5510 – Design Process (1st Semester) (1 CU)
	IPD 5520 – Problem Framing (2nd Semester) (1 CU)
	IPD 7990 – IPD Final Project (3rd Semester) (1 CU)
	IPD 7990 – IPD Final Project (4th Semester) (1 CU)
Business Breadth (1 CU)	
	BDS 5010 – Behavioral Science: Theory and Application of Experimental Methods (1 CU)
	BDS 5110 – Negotiation Behavior
	BDS 5210 – Judgments & Decisions (1 CU)
	BDS 5250 – Organizational Behavior
	BEPP 6200 – Behavioral Economics, Markets and Public Policy
	BEPP 7640 – Climate and Financial Markets
	EAS 5070 – Intellectual Property and Business Law for Engineers (1 CU)
	EAS 5120 – Engineering Negotiation (1 CU)
	EAS 5410 – Engineering Entrepreneurship I: Fundamentals of High-Tech Ventures
	EAS 5450 – Engineering Entrepreneurship I (1 CU) ** EAS 5450 cannot be counted towards both the foundation and business breadth.*
	EAS 5460 – Engineering Entrepreneurship II (1 CU)
	EAS 5470 – Engineering Product Management from Theory to Practice (1 CU)
	EAS 5490 – Engineering Entrepreneurship Lab (1 CU)
	ENVS 6302 – Climate Technology: Finance and Policy (1 CU)
	ENVS 6510 – Leading Change for Sustainability (1 CU)
	ENVS 6530 – Corporate Sustainability Strategies (1 CU)
	FNCE 7500 – Venture Capital and the Finance of Innovation (1 CU)
	HCMG 8530 – Management and Strategy in Medical Devices and Technology (1 CU)
	HCMG 8670 – Health Care Entrepreneurship (0.5 cu)
	LGST 8060 – Negotiations
	MGMT 6110 – Managing Established Enterprises
	MGMT 7290 – Intellectual Property Strategy for the Innovation–Driven Enterprise (0.5 CU)
	MGMT 7310 – Technology Strategy (1 CU)
	MGMT 7820 – Strategic Implementation
	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 8120 – Social Entrepreneurship (0.5 CU)
	MGMT 8920 – Collaborative Innovation Program (0.5-1.0 CU)
	MGMT 8960 – Decision Making in the Leadership Chair (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 7270 – Analytics and AI in Digital Marketing and Social Media (0.5 CU)
	MKTG 7370 – Applied Neuroscience for Business Decisions (1 CU)
	MKTG 7380 – Consumer Neuroscience (0.5 CU)
	MKTG 7680 – Contagious: How Things Catch On (1 CU)
	MKTG 7760 – Applied Probability Models in Marketing (1 CU)
	MKTG 8090 – Experiments for Business Decision Making (Center Special Topic) (1 CU)
	NPLD 5850 – Penn Social Impact Lab (1 CU)
	NPLD 5870 – Empowering Nonprofit Leaders to Thrive (1 CU)
	NPLD 7820 – Group Dynamics (1 CU)
	NPLD 7850 – Group Dynamics and Organizational Politics (1 CU)
	NPLD 7860 – Strategic Management and Leadership of Nonprofits (1 CU)
	NPLD 7870 – Leadership Theory and Practice (1 CU)
	NPLD 7910 – Leadership: Designing the Future
	OIDD 6120 – Business Analytics (1 CU)
	OIDD 6140 – Innovation (0.5 CU)
	OIDD 6620 – Enabling Technologies (1 CU)
	or a comparable course approved by petition
Design Breadth (1 CU)	
	ARCH 7240 – Technology in Design (1 CU)
	ARCH 7260 – Furniture Design as Strategic Process (1 CU)
	ARCH 7280 (IPD 5280) – Design of Contemporary Products: Design for Equity, Inclusion and Accessibility (1 CU)
	ARCH 7320 – Technology Designated Elective (1 CU) *Only Prof. Avery's section is preapproved.
	ARCH 7370 – Semi-Fictious Realms: A History and Future of Virtual Reality (1 CU)
	ARCH 7371 – Remixed Realities
	ARCH 7390 – Architecture and Design for 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)
	ARCH 8060 – Experimental Tooling
	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 5018 – Graphic Design I: Creative Technologies (1 CU)
	DSGN 5019 – 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)
	DSGN 5029 – Feminist Technoscience
	DSGN 5230 – Embodied Interfaces for Immersion

	FNAR 5025 – Computer Animation
	IPD 5110 – Fabrication Studio I (1 CU)
	IPD 5210 – Designing Smart Objects for Play and Learning (1 CU) (Rarely taught)
	IPD 5270 – Industrial Design I (1 CU)
	IPD 5340 – LLMs for UX Prototyping. (1 CU)
	IPD 5350 – Escape the Algorithm (1 CU)
	IPD 5440 (ARCH 7440) – Image, Object, Architecture (1 CU)
	IPD 5680 (DSGN5017) – Integrative Design Studio: Biological Design (1 CU)
	IPD 5720 – Design Thinking (1 CU)
	or a comparable course approved by petition
Engineering Breadth (1 CU)	
	BE 5140 (IPD 5040) – Rehab Engineering and Design (1 CU)
	BE 5210 – Brain-Computer Interface (1 CU)
	BMIN 5200 – Foundations of Artificial Intelligence in Health
	CIS 5120 – Introduction to Human-Computer Interaction
	CIS 5190 – Applied Machine Learning (1 CU)
	CIS 5200 – Machine Learning
	CIS 5210 – Artificial Intelligence
	CIS 5450 – Big Data Analytics (1 CU)
	CIS 5570 – Programming for the Web (1 CU)
	CIS 5800 – Machine Perception
	CIT 5900 – Programing Language and Techniques (1 CU)
	ENGR 5020 – Engineering Sustainability at Penn
	ENGR 5215 – Energy and Sustainability: Science, Engineering and Technology
	ESE 5160 – IoT Edge Computing (1 CU)
	ESE 5430 – Human Systems Engineering (1 CU)
	ESE 5450 – Data Mining: Learning from Massive Datasets (1 CU)
	ESE 6450 – Deep Generative Models
	IPD 5010 – Integrated Computer-Aided Design, Manufacturing and Analysis (1 CU)
	IPD 5140 (MEAM 5140) – Design for Manufacturability (1 CU)
	IPD 5160 – Advanced Mechatronics in Reactive Spaces (1 CU)
	IPD 5190 (ESE 5190) – Smart Devices (1 CU)
	IPD 5290 – Designing Connected Objects and Experiences (1 CU)
	MEAM 5020 – Energy Engineering in Power Plants and Transportation Systems (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)
	MEAM 5480 – Wind Physics and Applications
	or a comparable course approved by petition
Elective (**2 CU**) 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 of study. Electives should be chosen from the breadth lists above, from the elective list below or with petition approval.	
	IPD 5090 – Needfinding (1 CU)
	IPD 5110 – Fabrication Studio I (1 CU)
	IPD 5250 – Ergonomics/Human Factors Based Product Design (1 CU) (Rarely taught)
	IPD 5990 – Independent Study (1 CU)
	or a comparable course approved by petition

Seminar (2 CU) 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.

Curriculum: MSE:IPD Degree Program **10 CU + 2 Semesters of Seminar**	
Core Courses (6 CU)	
	MEAM 5140 (IPD 5140) – Design for Manufacturability (1 CU)
	IPD 5510 – Design Process (1st Semester) (1 CU)
	IPD 5520 – Problem Framing (2nd Semester) (1 CU)
	IPD 7990 – IPD Final Project (3rd Semester) (1 CU)
	IPD 7990 – IPD Final Project (4th Semester) (1 CU)
	MEAM 5100 – Design of Mechatronic Systems (1 CU)
Business Breadth (1 CU)	
	BDS 5010 – Behavioral Science: Theory and Application of Experimental Methods (1 CU)
	BDS 5110 – Negotiation Behavior
	BDS 5210 – Judgments & Decisions (1 CU)
	BDS 5250 – Organizational Behavior
	BEPP 6200 – Behavioral Economics, Markets and Public Policy
	BEPP 7640 – Climate and Financial Markets
	EAS 5070 – Intellectual Property and Business Law for Engineers (1 CU)
	EAS 5120 – Engineering Negotiation (1 CU)
	EAS 5410 – Engineering Entrepreneurship I: Fundamentals of High-Tech Ventures
	EAS 5450 – Engineering Entrepreneurship I (1 CU) **EAS 5450 cannot be counted towards both the foundation and business breadth.*
	EAS 5460 – Engineering Entrepreneurship II (1 CU)
	EAS 5470 – Engineering Product Management from Theory to Practice (1 CU)
	EAS 5490 – Engineering Entrepreneurship Lab (1 CU)
	ENVS 6302 – Climate Technology: Finance and Policy (1 CU)
	ENVS 6510 – Leading Change for Sustainability (1 CU)
	ENVS 6530 – Corporate Sustainability Strategies (1 CU)
	FNCE 7500 – Venture Capital and the Finance of Innovation (1 CU)
	HCMG 8670 – Health Care Entrepreneurship (0.5 CU)
	LGST 8060 – Negotiations
	MGMT 6110 – Managing Established Enterprises
	MGMT 7290 – Intellectual Property Strategy for the Innovation – Driven Enterprise (0.5 CU)
	MGMT 7310 – Technology Strategy (1 CU)
	MGMT 7820 – Strategic Implementation
	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 8120 – Social Entrepreneurship (0.5 CU)
	MGMT 8920 – Collaborative Innovation Program
	MGMT 8960 – Decision Making in the Leadership Chair
	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 7270 – Analytics and AI in Digital Marketing and Social Media (0.5 CU)
	MKTG 7370 – Applied Neuroscience for Business Decisions (1 CU)
	MKTG 7680 – Contagious: How Things Catch On (1 CU)
	MKTG 7760 – Applied Probability Models in Marketing (1 CU)
	NPLD 5850 – Penn Social Impact Lab (1 CU)
	NPLD 5870 – Empowering Nonprofit Leaders to Thrive (1 CU)
	NPLD 7820 – Group Dynamics (1 CU)
	NPLD 7850 – Group Dynamics and Organizational Politics (1 CU)
	NPLD 7860 – Strategic Management and Leadership of Nonprofits (1 CU)
	NPLD 7870 – Leadership Theory and Practice (1 CU)
	NPLD 7910 – Leadership: Designing the Future
	OIDD 6120 – Business Analytics (0.5 CU)
	OIDD 6140 – Innovation (0.5 CU)
	OIDD 6150 – Operations Strategy (0.5 CU)
	OIDD 6620 – Enabling Technologies (0.5-1 CU)
	or a comparable course approved by petition
Design Breadth (1 CU)	
	ARCH 7210 (IPD 5210) – Designing Smart Objects for Play and Learning (1 CU)
	ARCH 7240 – Technology in Design (1 CU)
	ARCH 7260 – Furniture Design Strategic Process (1 CU)
	ARCH 7320 – Technology Designated Elective (1 CU) -Only Prof. Avery's section is preapproved.
	ARCH 7370 – Semi-Fictious Realms: A History and Future of Virtual Reality (1 CU)
	ARCH 7371 – Remixed Realities
	ARCH 7390 – Architecture and Design for Health (1 CU)
	ARCH 7420 – Function of Fashion in Architecture (1 CU)
	ARCH 7430 – Form and Algorithm (1 CU)
	ARCH 7440 (IPD 5440) – Image, Object, Architecture (1 CU)
	ARCH 7510 – Ecology, Technology, and Design (1 CU)
	ARCH 8060 – Experimental Tooling
	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)-check title
	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)
	DSGN 5029 – Feminist Technoscience
	DSGN 5230 – Embodied Interfaces for Immersion

	FNAR 5025 – Computer Animation
	IPD 5110 – Fabrication Studio I (1 CU)
	IPD 5270 – Industrial Design I (1 CU)
	IPD 5280 (ARCH 7280) – Design of Contemporary Products: Design for Equity, Inclusion and Accessibility (1 CU)
	IPD 5340 – LLMs for UX Prototyping (1 CU)
	IPD 5350 – Escape the Algorithm (1 CU)
	or a comparable course approved by petition
Engineering Breadth (2 CU)	
	BE 5140 (IPD 5040) – Rehab Engineering & Design (1 CU)
	BE 5210 – Brain-Computer Interface
	BMIN 5200 – Foundations of Artificial Intelligence in Health
	CIS 5190 – Applied Machine Learning (1 CU)
	CIS 5120 – Introduction to Human-Computer Interaction
	CIS 5200 – Machine Learning
	CIS 5210 – Artificial Intelligence
	CIS 5450 – Big Data Analytics (1 CU)
	CIS 5570 – Programming for the Web (1 CU)
	CIS 5610 – Advanced Computer Graphics (1 CU)
	CIS 5800 – Machine Perception
	CIT 5900 – Programing Languages and Techniques (1 CU)
	ENGR 5020 – Engineering Sustainability at Penn
	ENGR 5215 – Energy and Sustainability: Science, Engineering and Technology
	ESE 5160 – IoT Edge Computing (1 CU)
	ESE 5450 – Data Mining: Learning from Massive Datasets (1 CU)
	ESE 6450 – Deep Generative Models
	IPD 5010 – Integrated Computer-Aided Design, Manufacturing, and Analysis (1 CU)
	IPD 5160 (MEAM 5160) – Advanced Mechatronics in Reactive Spaces (1 CU)
	IPD 5250 – Ergonomics/Human Factors Based Product Design (1 CU) (Rarely taught)
	IPD 5290 – Designing Connected Objects and Experiences (1 CU)
	MEAM 5020 – Energy Engineering in Power Plants and Transportation Systems (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)
	MEAM 5480 – Wind Physics and Applications
	or a comparable course approved by petition

5. CERTIFICATE PROGRAM REQUIREMENTS

The IPD Certificate is designed for students already enrolled in an approved graduate program outside of IPD. The certificate requires the completion of five course units. Students must complete two core courses selected from the approved core course list. In addition, students must complete one approved engineering course, one approved design course, and one approved business course. These courses should be selected from the engineering, design, and business course lists used to satisfy the corresponding breadth requirements for the M:IPD and MSE:IPD degrees. Unlike the IPD degree programs, which are awarded by Penn Engineering, the certificate is awarded by the Stuart Weitzman School of Design.

Curriculum: IPD Certificate 5 CU	
Core Courses (2 CU; Select 2 of 3 Courses)	
	IPD 5090 – Needfinding (1 CU) IPD 5110 – Fabrication Studio I (1 CU) IPD 5150 – Product Design (1 CU)
Engineering Breadth (1 CU)	
	Selected from the approved engineering breadth course lists (1 CU)
	or a comparable course approved by petition
Design Breadth (1 CU)	
	Selected from the approved design breadth course lists (1 CU)
	or a comparable course approved by petition
Business Breadth (1 CU)	
	Selected from the approved business breadth course lists (1 CU)
	or a comparable course approved by petition

6. ATTENDANCE AT SEMINARS AND PROJECT PRESENTATIONS

The attendance of all full-time graduate students at IPD seminars and final presentations is mandatory.

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 successfully complete two seminar courses (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 and it does count towards full-time enrollment status. Accelerated Master's students are full-time and therefore must accumulate two seminar course credits prior to graduation.

7. 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 here. More detailed information regarding LOA is available in the SEAS Graduate Student Handbook.

Obsoleteness
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 can 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.*

All IPD students 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. Students not making satisfactory progress towards their degree also will receive a letter from the Student Records and Financial Services Office. Students who receive two (2) cumulative incomplete, or 'I' grades on the transcript, will receive an academic warning. Per University policy, incomplete grades need to be corrected within one year's time. Please refer to the SEAS Graduate Student Handbook for more details.

Academic Integrity
Each student is expected to abide by and uphold Penn's Code of Academic Integrity and the Code of Student Conduct. Students are expected to contribute positively to the IPD community and are expected to uphold the rights of other IPD students. 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 Code of Academic Integrity.

8. 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.

9. 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 the degree awarded 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 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.

10. FINAL PROJECT

The IPD Final Project is the output of two semesters of interdisciplinary master's study combining engineering, design 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 three to five students from different backgrounds. The expected work and contributions from each member should be clearly delineated when teams form and on an ongoing basis.

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

11. GUIDELINES FOR COLLABORATIVE PROJECTS

Sharing Team Deliverables

Collaboration is a cornerstone of the IPD program. As such, many deliverables that you create in class will be team deliverables. We want to make sure students get credit for their creations while still acknowledging the collaborative nature of the work. Students are expected to share documents that are created as a part of team work with their teams and with the IPD faculty. This includes all native files including: Figma, Adobe Suite, CAD, software code, etc.

IPD faculty and staff can use images created in the process of project work to promote the program and as examples of the work that is done in the program. This work will be credited appropriately (student team members and class). If students are actively pursuing creating a company and are concerned about IP implications of sharing, they can request that parts of their work are not shared by emailing the Program Director and the Administrative Director.

Students on a team can share team work in their portfolios and are expected to identify the roles that they played on teams and their contributions to project work honestly and accurately.

When in doubt, have a conversation.

Documentation

Each team is expected to create and share the Google Drive folder in Google@SEAS and share documents there. Always share at least a PDF of your work for every deliverable in the Drive.

Intellectual Property (IP)

To the extent that your work results in patentable inventions there is a legal definition of who the inventors are that must be followed. An inventor is someone who contributed to the subject matter of at least one claim in the patent.

As a matter of patent law, each inventor has an equal and undivided ownership of the entire patent. This means that each inventor/owner has the right to make decisions about the entire patent (but also must share any profits from exploiting the patent equally with the other inventors).

However, inventors sometimes must assign their ownership rights - including control over the patent as well as the right to profit from it - to another party. This happens under certain circumstances described under the Penn Patent Policy. Since the Penn Patent Policy applies to all project work completed as part of your coursework, you should read it carefully to determine who will own the rights to any invention (and any related patent) that you create.

Penn Patent Policy applies to all project work completed as part of your coursework.

Company creation

Student teams will sometimes decide to continue work that they have begun as part of a class and form a company. Other than IP law, there are no strict rules to follow as to who gets credit for work that was done in the course of a class. An approach that we recommend is to consider that team members who do not pursue the project after the class have received compensation for their work in the form of a grade and course credit.

12. ACCELERATED MASTER'S

Outstanding undergraduate students at the University may apply for Accelerated Master's (AM) in their junior year (applications due February 1st) 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 bachelor's degree and a MSE:IPD or a bachelor's degree and a M:IPD degree. Undergraduates at the University of Pennsylvania may double-count up to three graduate level courses taken while enrolled as an AM towards both the undergraduate and the graduate degrees. Currently, an Engineering student may take a maximum of 3 CU's at the graduate level prior to matriculation into the AM degree. These 3 CU's must be courses that double count between the undergraduate degree and the master's degree. Any graduate level (5000+) course taken beyond the 3 CU's, prior to matriculation into the master's degree, will not be eligible for counting towards the master's degree. Students should check with their undergraduate home school and review the SEAS Accelerated Master's policy for current policy and procedures.

If studio work is begun before the end of the senior year (taking IPD 5510 in the fall and IPD 5520 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.

Students enrolled as an accelerated master's student 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 1st deadline and before the end of the junior year. Accelerated Master's applications are available online via the Penn Engineering website.

13. 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 Penn 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 four courses towards both programs.

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

14. 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, as well as a limited number of regular courses occasionally offered by some SEAS departments. The Director must approve summer school courses.

15. RECORDS

Transcripts can be viewed on Path@Penn and official copies can be requested form Student Financial Services. Graduate students are encouraged to periodically check the accuracy of their records and to bring any discrepancies to the attention of the Director.