

Centre for Product Design and Manufacturing

M Des Programme 2021: Duration: 2 years, 64 credits

Yellow for courses offered in Aug session, Green for courses in Jan session

Recommendation:

21 credits with the courses below:

PD 201	2:1 Elements of Design
PD 203	2:1 Creative Engineering Design
PD 205	2:1 Materials, Manufacturing and Design
PD 207	1:2 Product Visualisation, Communication & Presentation
PD 211	2:1 Product Design
PD 231	2:1 Applied Ergonomics
PD 236	2:1 Embodiment Design

9 credits with any **three** courses below:

PD 202	3:0 Elements of Solid and Fluid Mechanics (only for first year students)
PD 204	2:1 Basics of Electronics for Product Design and Manufacturing
PD 206	2:1 Basics of Computing, AI and Data Science for Design and Manufacturing
PD 215	2:1 Mechatronics

6 credits from **any** courses below:

PD 209	3:0 New Product Development: Concepts and Tools
PD 212	2:1 Computer Aided Design
PD 216	2:1 Design of Automotive Systems
PD 217	2:1 CAE in Product Design
PD 218	2:1 New Product Development: Strategy and Practice
PD 229	0:3 Computer Aided Product Design
PD 221	2:1 Methodology for Design Research
PD 230	2:1 Haptic Systems Design
PD 232	2:1 Human Computer Interaction
PD 233	2:1 Design of Biomedical Devices and Systems
PD 235	2:1 Mechanism Design
E3 276	2:1 Process Technology & System Engg for Adv Microsensors and Devices
PD 239	0:3 Design and Society (any time)

12 credits from the remaining courses above, and/or courses from other departments

Project: 16 Credits. mandatory for all: PD 299 0:16 Dissertation Project

Explanation

The MDes in Product Design and Engineering programme at CPDM is intended to train students to become designers with a holistic sense of design (i.e. planning for change), so that they can develop hardware-centric products and systems that are systemically complex, technologically intensive, and societally impactful, and are functional, aesthetic, usable and sustainable. The students should be able to identify problems, develop solutions, embody and prototype these, and test a working prototype to demonstrate the solution, create invention disclosures, and be able to pitch as an entrepreneur to take these to the society. They should have an overall ability to develop and prototype using mechanical, electrical/electronic and computing technologies.

21 credits from all the courses below:

These courses provide a 360-degree view of the essential aspects of design and therefore considered mandatory by the faculty: design thinking and methodology for conceptualisation and embodiment (PD 203, PD 236), Aesthetic and Semantic aspects of a 2D or 3D product (PD 201, PD 211), Usability (PD 231), materials and Manufacturing Processes (PD 205), and ability to visualize a product as sketches, rendering, and physical mockups (PD 207).

PD 201	2:1 Elements of Design
PD 203	2:1 Creative Engineering Design
PD 205	2:1 Materials, Manufacturing and Design
PD 207	1:2 Product Visualisation, Communication & Presentation
PD 211	2:1 Product Design
PD 231	2:1 Applied Ergonomics
PD 236	2:1 Embodiment Design

9 credits from any three courses below:

These bridge-courses prepare the student with the background needed for prototyping cyber-electro-mechanical systems as products. Depending on the areas in which a student lacks background, he/she should choose 3 of the 4 courses below to cover basics of: mechanical engineering (PD 202), Electronics (PD 204), computing (PD 206), or Mechatronics (PD 215).

PD 202	3:0 Elements of Solid and Fluid Mechanics
PD 204	2:1 Basics of Electronics for Product Design and Manufacturing
PD 206	2:1 Basics of Computing, AI and Data Science for Design and Manufacturing
PD 215	2:1 Mechatronics

6 credits from any courses below:

These courses give students an opportunity to take courses that prepare them for their final projects or for them to pursue their special interests. For those interested in product strategy, NPD and entrepreneurship, PD 209 and PD 218 should be helpful. For those interested in automotive design, PD 216 should be useful. For those interested in CAD and CAE, PD 212

and PD 217 should be useful. For interest in applying CAD in a product design project, PD 229 would be helpful. PD 233 is useful for those interested in biomedical systems design. Mechanism Design can be learnt from PD 235. For interest in Human Machine Interaction, courses PD 230 and PD 232 would be helpful. For learning electronic prototyping, E3 276 should be useful. For those interested in research, PD 221 and PD 239 should be of interest: the first one trains in how to do research; the second one allows working on a research project.

PD 209	3:0 New Product Development: Concepts and Tools
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PD 229	0:3 Computer Aided Product Design
PD 221	2:1 Methodology for Design Research
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PD 233	2:1 Design of Biomedical Devices and Systems
PD 235	2:1 Mechanism Design
E3 276	2:1 Process Technology & System Engg for Adv Microsensors and Devices
PD 239	0:3 Design and Society

12 credits from any of the remaining courses above, and/or courses from other departments

Project: 16 Credits. mandatory for all

PD 299	0:16 Dissertation Project
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A final year, 'Major' project in MDes programme is carried out by a team of students (typically two) under a faculty supervisor. The project idea may come from a student or a faculty supervisor that are chosen based on their feasibility and impact. The central outcome of each project is a novel product concept and associated working prototype. The students will undergo a systematic product development process of need and problem identification, and the ideation, development, prototyping and testing of a novel and appropriate solution.