

Masters Degree – Product Development Engineering Progressive Degree Option

The MS in Product Development Engineering is an interdisciplinary degree program jointly offered by the Aerospace and Mechanical Engineering and the Daniel J. Epstein Industrial and Systems Engineering Departments. The Aerospace and Mechanical Engineering Department will manage this joint degree program.

Developing new products is the essence of human intelligence in general, and engineering professions in particular. The growth of our economy has been largely determined by the engineer's performance and effectiveness in new product developments. The ever-increasing demands for product functions, coupled with low cost, high quality, and short lead-time requirements have made product development a very complex and inter-disciplinary activity. The recent high-tech revolutions and stringent environmental concerns have further contributed to the complexity of modern product development. There exists a great human resource need in the areas of new product developments.

There are three interrelated disciplines in product development: art, management, and engineering. The MS in Product Development Engineering program focuses on the engineering discipline, ranging from technology to systems. From the engineering viewpoint, product development can be seen as a process from invention, design, planning, production, to service phases. Three types of knowledge are needed for an engineer to go through these phases:

- knowledge to generate new product ideas
- knowledge to evaluate these ideas
- knowledge to structure and manage the development process

This innovative degree program provides students with an integrated education experience, including modern theories and practical experiences, to acquire this knowledge systematically so that they can accomplish these phases efficiently.

All students are required to take the (2) core courses. Then you will choose which Specialization and complete those requirements.

Core Courses (6 units)

- ISE 501 Innovative Conceptual Design for New Product Development Units: 3
- ISE 545 Technology Development and Implementation Units: 3

Product Development Systems Specialization (12-14 units)

- ISE 515 Engineering Project Management Units: 3 (Fa, Sp, Su)
- ISE 544 Leading and Managing Engineering Teams Units: 3 (Fa, Sp, Su)

Product Development Systems Electives **Select two courses.**

- BAEP 557 Technology Commercialization Units: 3 (Sp)
- CE 576 Invention and Technology Development Units: 4
- DSCI 552 Machine Learning for Data Science Units: 4 (Fa, Sp)
- ISE 510 Advanced Computational Design and Manufacturing Units: 3 (Sp)
- ISE 511L Mechatronic Systems Engineering Units: 3 (Fa)
- ISE 514 Advanced Production Planning and Scheduling Units: 3 (Fa, Sp)
- ISE 525 Design of Experiments Units: 3 (Sp)
- ISE 527 Quality Management for Engineers Units: 3 (Fa, Sp)
- ISE 561 Economic Analysis of Engineering Projects Units: 3 (Fa, Sp, Su)
- ISE 562 Decision Analysis Units: 3 (Fa, Sp)
- ISE 567 Collaborative Engineering Principles and Practice Units: 3
- ISE 580 Performance Analysis with Simulation Units: 3 (Fa, Sp)
- ISE 583 Enterprise Wide Information Systems Units: 3 (Fa, Sp, Su)
- ISE 585 Strategic Management of Technology Units: 3 (Fa, Sp)
- ISE 610 Advance Design of Experiments and Quality Engineering Units: 3 (Fa)
- SAE 541 Systems Engineering Theory and Practice Units: 3 (Fa, Sp)
- SAE 549 Systems Architecting Units: 3 (Fa, Sp)

***Total Units Required for the Systems Specialization PDP degree: 18-20**

(term offerings in parenthesis are expected but not guaranteed)

