

Proposed MS in Product Development Engineering (PDE)

Depending on the academic background and career interests of students, the program offers two areas of specialization: Product Development Management and Product Development Technology.

The Management specialization offers more ISE courses to prepare students to be product development managers, whereas the Technology specialization includes more AME courses to prepare students to be product development engineers.

Curriculum

The required 28 units are grouped into four categories, (A) degree required, (B) specialization required, (C) technical elective, and (D) one (4 unit) general elective, for both Management and Technology Specializations:

For all MSPDE (both Management and Technology Specializations) Students:

(A). MSPDE DEGREE REQUIRED COURSES (8 UNITS)		UNITS
ISE501/AME501	Innovative Conceptual Design for New Product Development	4
ISE445/ENGR445	Principles and Practices of Global Innovation	4

For MSPDE Management Specialization Students:

(B). MANAGEMENT SPECIALIZATION REQUIRED COURSES (8 UNITS)		UNITS
ISE 515	Project Management	4
<i>Choose one of the following two courses:</i>		
ISE 544	Leading and Managing Engineering Teams	4
ISE 585	Strategic Management of Technology Innovation	4

(C). MANAGEMENT SPECIALIZATION TECHNICAL ELECTIVES (8 UNITS)		UNITS
ISE 510	Advanced Computational Design and Manufacturing	4
ISE 511L	Mechatronics Systems Engineering	4
ISE 514	Advanced Planning and Scheduling	4
ISE 544 or ISE 585	<i>(Choose one that is not included as a specialization required course)</i>	4
SAE/AME 549	Systems Architecting	4
ISE 525	Design of Experiments	4
ISE 527	Quality Management for Engineers	4
CE 576	Invention and Technology Development	4
ISE 561	Economic Analysis of Engineering Projects	4
ISE 562	Decision Analysis	4
ISE 580	Performance Modeling with Simulation	4
ISE 583	Enterprise Wide Information Systems	4
ISE 610	Advance Design of Experiments and Quality Engineering	4
SAE 541	Systems Engineering Theory and Practice	4
BAEP 557	Technology Commercialization	4

(D). MANAGEMENT SPECIALIZATION GENERAL ELECTIVES (SUGGESTED)	
<ul style="list-style-type: none"> ● Must be upper-division 400- or 500-level courses approved by the advisor ● Up to 4 units can be transferred from other institutions 	

ISE 460	Engineering Economy	4
ISE 470	Human/Computer Interface Design	4
ISE506/SAE551	Lean Operations	4
ISE 520	Optimization: Theory and Algorithms	4
ISE 529	Predictive Analytics	4
ISE 530	Optimization Methods for Analytics	4
DSCI 552	Machine Learning for Data Science	4
ISE568/CSCI567	Machine Learning	4
ISE/PPD 587	Risk Analysis	4
ISE 633	Large Scale Optimization and Machine Learning	4
BAEP 556	Technology Feasibility	4

For MSPDE Technology Specialization Students:

(B). TECHNOLOGY SPECIALIZATION REQUIRED COURSES (8 UNITS)		UNITS
AME503	Advanced Mechanical Design	4
<i>Choose one of the following two courses:</i>		
AME525	Engineering Analysis	4
AME526	Engineering Analytical Methods	4

(C). TECHNOLOGY SPECIALIZATION <u>TECHNICAL ELECTIVES</u> (8 UNITS)		UNITS
AME 408	Computer-Aided Design of Mechanical Systems	4
AME 410	Engineering Design Theory and Methodology	4
AME 502	Modern Topics in Aerospace Design	4
AME 505	Engineering Information Modeling	4
AME 525 or AME 526	<i>(Choose one not included as a specialization required course)</i>	4
AME 527	Elements of Vehicle and Energy Systems Design	4
AME 544	Computer Control of Mechanical Systems	4
AME 546	Design for Manufacturing and Assembly	4
AME 547	Foundations for Manufacturing Automation	4
AME/SAE 549	Systems Architecting	4
AME/MASC551	Mechanical Behavior of Engineering Materials	4
AME/ISE 567	Collaborative Engineering Principles and Practice	4
AME 588/ MASC 583	Materials Selection	4
ASTE 523	Design of Low-Cost Space Missions	4
ISE 510	Advanced Computational Design and Manufacturing	4
CE 576	Invention and Technology Development	4
ISE 576	Industrial Ecology: Technology-Environment Interaction	4
ISE 585	Strategic Management of Technology Innovation	4

(D). TECHNOLOGY SPECIALIZATION <u>GENERAL ELECTIVES</u> (4 UNITS)		
<ul style="list-style-type: none"> ● Must be upper-division 400- or 500-level courses approved by the advisor ● Up to 4 units can be transferred from other institutions 		
AME 481	Aircraft Design	4
AME 514	Applications of Combustion and Reacting Flows	4
AME528a/CE529a	Finite Element Analysis	4

AME528b/CE529b	Finite Element Analysis	4
AME/CE 543	Stability of Structures	4
AME 577	Survey of Energy and Power for a Sustainable Future	4
AME 578	Modern Alternative Energy Conversion Device	4
ASTE 520	Spacecraft System Design	4
CE 550	Computer-Aided Engineering	4
CE 551	Computer-Aided Engineering Project	4

Total Units Required for the MSPDE Degree (either specialization)		28
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