

# MS IN PRODUCT DESIGN

## Overview

The MS in Product Design offers students a unique cross-disciplinary education cutting across multiple engineering disciplines in a world class research and innovation based environment. The 30-credit, 1 year program will not only build fundamentals in formulation based product design through core technical courses but will complement it with building key skills and competencies in innovation management and entrepreneurship, all of which are critical for product engineers. In addition to core competencies, the program will allow students to specialize in a industry sector of their choice through the flexibility of the broad industry specific concentration areas.

## Admission Requirements

Students will apply directly to the College of Engineering for the Graduate Program. Students must have a related bachelor's degree in Engineering, Physics, Chemistry, or other technical fields with a minimum GPA of 3.0 on a 4.0 scale. There is flexibility based on a holistic review of the application. For non-native English speakers, the minimum TOEFL score is 80 and the minimum IELTS score is 6.5.

## Curriculum Requirements

Code	Title	Credit Hours
<b>Technical Core Courses</b>		<b>9</b>
Students will choose 3 from the following:		
CET 790	Advanced Topics (SoftMatter and Colloids)	
BME 635	Advanced Biomaterials	
CHM 620	Physical Organic Chemistry	
CHM 624	Supramolecular Chemistry	
CHM 665	Principles of Spectroscopic Techniques	
CHM 681	Advanced Analytical Chemistry	
<b>Innovation Management Core Courses</b>		<b>9</b>
Students will choose 3 from the following:		
ISE 672	Management of Technological Innovation	
ISE 763	Project Management Techniques	
ISE 670	Engineering Management	
ISE 671	Engineering Entrepreneurship	
ISE 772	Strategic Management of Technological Innovation.	
<b>Sector Specific Concentration Courses</b>		<b>9</b>
Students will choose 3 courses from their sector of interest:		
<b>Sector: Cosmetics and Consumer Goods</b>		
BME 695	Current Trends in Regenerative Medicine	
CAE 729	Molecular Simulation of Materials	
CET 795	Special Problems (Formulation Design)	
ECE 643	BioNanotechnology	
<b>Sector: Pharmaceuticals and Biopharmaceuticals</b>		
BME 665	Principles of Cellular and Tissue Engineering	
BME 685	Immunoengineering	
CET 795	Special Problems (Formulation Design)	
ECE 677	Data Mining	
<b>Sector: Nanotechnology</b>		
BME 622	Scanning Electron Microscopy for Engineers	
CET 790	Advanced Topics (Aerosol Measurement Techniques)	
ECE 643	BioNanotechnology	
Other courses by approval		
<b>Master's Project</b>		
CET ###	New Course: Master's Project	3
<b>Total Credit Hours</b>		<b>30</b>

## Sample Plan of Study

First Year		Credit Hours
<b>Fall</b>		
CET 790	Advanced Topics (SoftMatter and Colloids)	3
CHM 624	Supramolecular Chemistry	3
ISE 763	Project Management Techniques	3
ISE 671	Engineering Entrepreneurship	3
Concentration Course		3
		<b>Credit Hours</b>
		<b>15</b>
<b>Spring</b>		
BME 635	Advanced Biomaterials	3
ISE 672	Management of Technological Innovation	3
Concentration Course		3
Concentration Course		3
		<b>Credit Hours</b>
		<b>12</b>
<b>Summer</b>		
Master's Project		3
		<b>Credit Hours</b>
		<b>3</b>
		<b>Total Credit Hours</b>
		<b>30</b>

## Mission

- Provide high quality graduate education in fundamentals of formulation based product design, innovation management and entrepreneurship and in industry specific technical knowledge. This will prepare graduates for wide ranging professional careers and leadership roles.
- Conduct high quality applied research with industry guidance to advance current body of knowledge in complex product design.
- Serve the formulated product industries and engineering profession as a Center of Excellence for Product Innovation and Design through active engagement with industry, professional bodies and through contribution of professional expertise.

## Goals

The educational objectives of the Product Design program is to produce graduates with:

- Advanced knowledge in softmatter, colloidal systems, biomaterials and industry specific knowledge.
- Advance knowledge in innovation, innovation management and entrepreneurship
- Potential to make significant contributions to product innovation across multiple industrial sectors.

## Student Learning Outcomes

- Students will demonstrate an advanced knowledge of both formulation principles and innovation management
- Students will demonstrate an advanced ability to identify, formulate and solve product design and product engineering problems to carry out supervised research
- Students will demonstrate an advanced ability to generate technical and business strategy contributions and effectively communicate that to the industrial R&D and scientific community.