

ENGM 532 Product Design and Innovation

Course Description

This course explores the critical role of innovation in engineering and the structured processes involved in developing new products and services. Emphasizing both analytical and practical perspectives, students will learn to manage product development decisions effectively, from idea generation and concept development to product design and the market launch. The course bridges theoretical foundations with practical applications, preparing students to address real-world challenges in innovation and product development.

Course Learning Outcomes

By the end of the course, students will be able to:

1. Demonstrate critical knowledge and understanding of the role of innovation in achieving competitive advantage and driving business growth
2. Apply professional level and specialized research methods and tools to manage the innovation process from idea generation to product launch.
3. Evaluate product development decisions by analyzing real-world case studies, integrating risk, market, and performance insights.
4. Communicate complex product design and innovation concepts effectively in both written and oral formats.
5. Assess product sustainability and ethical dimensions by integrating environmental, economic, and social considerations.
6. Use professional level skills to develop innovation engineering solutions and assume significant responsibility in real-world product design projects.

Learning Resources

Product Design and Development" by Karl T. Ulrich and Steven D. Eppinger, 7th (2020), McGraw-Hill Education

Course Content

1. Introduction to Innovation and Product Design
2. The Innovation Process
3. Market Research and Idea Generation
4. Concept Development and Evaluation
5. Product Design and Prototyping
6. Innovation Metrics and Evaluation
7. Managing the Innovation Process
8. Case Studies in Product Innovation
9. Product Launch and Commercialization
10. Sustainable and Inclusive Innovation