Product Planning & Development  
(21-423)

Advanced Manufacturing Laboratory  
Department of Industrial Engineering  
Sharif University of Technology

Session #3

Course Description

- Instructor
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- Recommended prerequisite
  - Manufacturing process I (21-418)
- Class time
  - Sunday-Tuesday 18:00-19:30
- Course evaluation
  - Mid-term (25%)  
  - Final exam (40%)  
  - Quiz (5%)  
  - Exercise (Manufacturing Lab.) (30%)
Course Description (Continued ...)

- Mid-term session:
  - Wednesday: 9th Ordibehesht 1394, 16:30 ~ 18:30

- Final Exam:
  - Monday: 1st Tir 1394, 09:00 ~ 11:30

- Reference:


Course Description (Continued...)

- Contents:
  - Product development in the changing Global world
  - Stages of Product Development
  - The Structure of the Product Design Process
  - Early design: Requirement definition and conceptual Design
  - Trade-off analyses: Optimization using cost and utility Metrics
  - Detailed design: Analysis and Modeling
  - Design Review: Designing to Ensure Quality
  - Production System: Strategies, planning, and methodologies
  - Production System Development
  - Planning and Preparation for Efficient Development
  - Supply chain: Logistics, packaging, supply chain, and the environment
Product Development

- Attributes of successful product development
  - Cost: both the cost of producing the product and the total cost of developing it.
  - Quality: the quality of the product.
  - Product development time: from assessing market needs to product sale.
  - Development of know-how: the ability to repeat the process for future products
Product Development

- Key factors to developing successful new products
  - Uniqueness
Product Development

- Key factors to developing successful new products
  - Uniqueness
  - Customer Focus and Market Orientation

- Telling the World You Have a Good Product
Product Development

- Key factors to developing successful new products
  - Uniqueness

- Customer Focus and Market Orientation

- Telling the World You Have a Good Product

- Availability of a Systematic New Product Process

- Market Attractiveness
Product Development

- Key factors to developing successful new products
  - Uniqueness
  - Customer Focus and Market Orientation
  - Telling the World You Have a Good Product
  - Availability of a Systematic New Product Process
  - Market Attractiveness
  - Experience and Core Competencies

Stages of the Product Development

- Strategy for new product development
  - The primary objective in establishing a strategy and a business plan for developing a new product is to ensure that all concerned parties “buy into” the effort and a consensus is reached on the fundamental inputs to the plan

- Product development strategy activities
  - Determining the company’s growth expectations from the new products
  - Gathering information of interest regarding capabilities, market, and the customers
  - Determining what opportunities exist
  - Setting criteria for inclusion of product(s) in the company’s portfolio of products
  - Creating the product portfolio (new, modified, and existing).
  - Managing the product portfolio to maximize profitability

  Developing Product development plan
Stages of the Product Development

- **Strategy for new product development**
  - **Product development strategy activities**
    - Setting criteria for inclusion of product(s) in the company’s portfolio of products
    - The company expects that including a new product in its portfolio of products will increase its sales revenue and profitability.
  - Typically, all businesses expect a minimum return on investment (ROI).
  - Other Like: Net Promoter Score (NPS),...

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![Diagram showing stages of product development](image)
Stages of the Product Development

- Developing Product development plan
  - Understanding Consumers and Their Needs
  - What are their critical needs and how well are these being met at present?
  - Who are the consumers, what products do they use, how do they use products, and under what conditions are the products used?
  - How are current market products received and perceived with respect to meeting their needs?
  - How do consumers know that a product is working, what signals convey that a product is working?

Stages of the Product Development

- Developing Product development plan
  - Understanding Consumers and Their Needs
  - What are their critical needs and how well are these being met at present?
  - Who are the consumers, what products do they use, how do they use products, and under what conditions are the products used?
  - Market research techniques help in understanding consumer needs.
    - Qualitative
      - Focus group interviews,
      - One-on-one or in-depth interviews, and
      - In-home visits
    - Quantitative
      - Brand image research,
      - Segmentation research, and
      - Conjoint analysis
Stages of the Product Development

- Developing Product development plan
  - Understanding Consumers and Their Needs
    - How are current market products received and perceived with respect to meeting their needs?
      - The market understanding should clarify how the product will benefit both the consumer and the company and should focus on the following factors:
        - Market fit with the overall mission of the company.
        - Synergy between the market and the company.
        - Attractiveness of the market.

- Developing Product development plan
  - Understanding Consumers and Their Needs
    - How do consumers know that a product is working, what signals convey that a product is working?
      - Performance: primary operating characteristics of the product.
      - Features: characteristics of the product.
      - Reliability: mean time between failures.
      - Durability: product life estimate.
      - Serviceability: ease of repair, part replacement, maintenance.
      - Aesthetics: look, feel, sound.
      - Packaging: packaging requirements, labeling, handling.
      - Perceived quality: subjective reputation of the product.
      - Cost: manufacturing, servicing.