

IPD 601

Integrated Product Development I

Course Objectives

The first IPD course objectives are: to address methodologies and tools to define product development phases; to experience working in teams to design high-quality competitive products; to improve ability to reason about design, material and process alternatives; to apply modeling techniques appropriate for different development phases. Topics covered are: user requirements gathering, quality function deployment, design for assembly, design for materials and manufacturing processes, and optimizing the design for cost and producibility.

Text 1. Product Design For Manufacture and Assembly
Geoffrey Boothroyd, Peter Dewhurst and Winston Knight
Marcel Dekker, ISBN # 0-8247-0584-X

Course Outline

1. Introduction

- 1.1 Integrated Product Development Cycle
- 1.2 Customer Needs
- 1.3 The Engineering Design Specification and Requirements
- 1.4 Quality Function Deployment
- 1.5 Case Studies

2. Integrated Product and Process Development

- 2.1 Integrated Product & Process Analysis
- 2.2 Product Design for Assembly
- 2.3 Selection of Materials and Processes
- 2.4 Role of Processing in Design

3. Cost and Producibility Evaluation

- 3.1 Engineering Economics
- 3.2 Manufacturing Cost Estimation
- 3.3 Life-Cycle Assessment and Costing

4. Analytical and Numerical Analysis

- 4.1 Decision Making
- 4.2 Cost and Producibility Optimization
- 4.3 Robust Design and Taguchi Method
- 4.4 Failure Mode and Effect Analysis

