Part 1 - Basics

1) Introduction to Mechanical Engineering Design

2) Materials

3) Load and Stress Analysis

4) Deflection and Stiffness

Part II - Failure Prevention

5) Failures Resulting from Static Loading

6) Fatigue Failure Resulting from Variable Loading

Part III - Design of Mechanical Elements

7) Shafts and Shaft Components

8) Screws, Fasteners, and the Design of Nonpermanent Joints

9) Welding, Bonding, and the Design of Permanent Joints

10) Mechanical Springs

11) Rolling-Contact Bearings

12) Lubrication and Journal Bearings

13) Gears - General

14) Spur and Helical Gears

15) Bevel and Worm Gears

16) Clutches, Brakes, Couplings and Flywheels

17) Flexible Mechanical Elements

18) Power Transmission Case Study

Part IV - Special Topics

19) Finite Element Analysis

20) Geometric Dimensioning and Tolerancing

Appendices

A - Useful Tables

B - Answers to Selected Problems