

Mechanism Design *with Creo Elements/Pro 5.0* *(Pro/ENGINEER Wildfire 5.0)*



Kuang-Hua Chang, Ph.D.
School of Aerospace and Mechanical Engineering
The University of Oklahoma
Norman, OK

SDC
PUBLICATIONS

www.SDCpublications.com

Schroff Development Corporation

Table of Contents

Preface	i
Acknowledgments	ii
About the Author	iii
About the Cover Page	iii
Table of Contents	iv

Lesson 1: Introduction to *Mechanism Design*

1.1 Overview of the Lesson	1-1
1.2 What is <i>Mechanism Design</i> ?	1-1
1.3 Mechanism and Motion Analysis	1-3
1.4 <i>Mechanism Design</i> Capabilities	1-5
1.5 Open Lesson 1 Model	1-12
1.6 Motion Examples	1-13

Lesson 2: The Ball Throwing Example

2.1 Overview of the Lesson	2-1
2.2 The Ball Throwing Example	2-1
2.3 Using <i>Mechanism Design</i>	2-3
2.4 Result Verifications	2-13
Exercises	2-15

Lesson 3: A Spring Mass System

3.1 Overview of the Lesson	3-1
3.2 The Spring-Mass System	3-1
3.3 Using <i>Mechanism Design</i>	3-3
3.4 Result Verifications	3-10
Exercises	3-14

Lesson 4: A Simple Pendulum

4.1 Overview of the Lesson	4-1
4.2 The Simple Pendulum Example	4-1
4.3 Using <i>Mechanism Design</i>	4-3
4.4 Result Verifications	4-9
Exercises	4-13

Lesson 5: A Slider-Crank Mechanism—Static and Motion Analyses

5.1	Overview of the Lesson	5-1
5.2	The Slider-Crank Example.....	5-1
5.3	Using <i>Mechanism Design</i>	5-4
5.4	Result Verifications.....	5-16
	Exercises	5-20

Lesson 6: A Compound Spur Gear Train

6.1	Overview of the Lesson	6-1
6.2	The Gear Train Example.....	6-2
6.3	Using <i>Mechanism Design</i>	6-4
	Exercises	6-14

Lesson 7: Planetary Gear Train Systems

7.1	Overview of the Lesson	7-1
7.2	The Planetary Gear Train Examples	7-2
7.3	Using <i>Mechanism Design</i>	7-5
	Exercises	7-16

Lesson 8: Cam and Follower

8.1	Overview of the Lesson	8-1
8.2	The Cam and Follower Example.....	8-1
8.3	Using <i>Mechanism Design</i>	8-4
	Exercises	8-13

Lesson 9: Assistive Device for Wheelchair Soccer Game

9.1	Overview of the Lesson	9-1
9.2	The Assistive Device.....	9-1
9.3	Using <i>Mechanism Design</i>	9-3
9.4	Result Discussion	9-10

Lesson 10: Kinematic Analysis for Racecar Suspension

10.1	Overview of the Lesson	10-1
10.2	The Quarter Suspension	10-2
10.3	Using <i>Mechanism Design</i>	10-5

Appendix A: Defining Joints	A-1
Appendix B: Defining Measures	B-1
Appendix C: The Default Unit System	C-1
Appendix D: The Magnitude Settings	D-1