

Fall 2020

ME 231-101: Kinematics of Machinery

Kevin Russel

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Kinematics of Machinery (ME 231-101)

Instructor: Dr. K. Russell, P.E.

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Office: 333D MEC

Office Hours: Tues 2:30-5:30, Thurs 2:30-5:30 p.m. (no appointment)

Course Summary

ME 231 is an introductory course in the design and analysis of planar and spatial mechanical systems.

Prerequisites

CIS 101, Mech 234 and access to MATLAB[®] and SimMechanics[®]

Course Materials

Textbook: K. Russell, Q. Shen and R. S. Sodhi, “Kinematics and Dynamics of Mechanical Systems: Implementation in MATLAB[®] and SimMechanics[®] Second Edition,” CRC Press, Boca Raton, 2019. ISBN 9781498724937.

DATES	TOPICS AND CHAPTERS	HW PROBLEMS
09/01	Introduction (Ch 1), Complex Vectors (Ch 2)	Ch 2: 2, 3, 6, 8, 10
09/15	Kinematics Fundamentals (Ch 3)	2, 3, 8, 10, 13, 14
09/22	4-bar and Slider-crank Kinematic Analysis (Ch 4)	6, 7, 8, 9, 10, 17, 19
09/29	5-bar and Multi-loop Kinematic Analysis (Ch 4)	24, 25, 27, 31, 33, 35
10/06	Dimensional Synthesis (Ch 5)	4, 8, 27, 28, 33, 34
10/13	Planar Mechanism Static Force Analysis (Ch 6)	3, 4, 17, 22, 29, 34
10/20	Planar Mechanism Dynamic Force Analysis (Ch 7)	3, 4, 21, 28, 31, 35
10/27	Gear Design and Kinematic Analysis (Ch 8)	2, 4, 6, 8, 9, 12
11/03	class does not meet, (Proj. 1 due NLT 9:00 pm)	
11/10	Gear Design and Kinematic Analysis (Ch 8)	14, 18, 19, 30, 32, 35
11/17	Cam Design and Kinematic Analysis (Ch 9)	6, 12, 14, 19, 24, 30
11/24	Kinematic Analysis of Spatial Mech. (Ch 10)	3, 9, 19, 23, 28, 30
12/01	Introduction to Robotic Systems (Ch 11)	
12/08	Introduction to Robotic Systems (Ch 11)	4, 11, 15, 22, 30, 34
12/15	class does not meet, (HW, Proj. 2 and Proj. 3 due NLT 9:00 pm)	

Grading

3 Projects (33% each), Homework 34%,

A \geq 90, 90>B \geq 85, 85>B \geq 80, 80>C \geq 75, 75>C \geq 70, 70>D \geq 60, 60>F

Policies

Homework submitted after due date will be penalized (**1/2 credit if one week late and no credit beyond one week**).

There is a stiff penalty for any violation of the NJIT Honor Code (e.g., plagiarism and cheating on exams and assignments)

Link for Downloads <http://www.softalink.com/kruss/me231/filename.pdf>
/ME231.pdf