Fall 2024

ME 231-101: Kinematics of Machinery

Kevin Russell

Kinematics of Machinery (ME 231-101)
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Office: 333D MEC
Office Hours: Mon 3:30-5:30 and Wed 3:30-5:30, no appointment for in-person visit (appointment needed for Zoom visit)

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

Perquisites
CIS 101, Mech 234 and access to MATLAB® and Simscape Multibody®

Course Materials
Textbook: K. Russell, Q. Shen and R. S. Sodhi, "Kinematics and Dynamics of Mechanical Systems: Implementation in MATLAB® and SimMechanics® Third Edition," CRC Press, Boca Raton, 2019. ISBN 9781032328317.

DATES	TOPICS AND CHAPTERS	HW PROBLEMS
09/04	Introduction (Ch 1), Complex Vectors (Ch 2)	CH2.pdf
09/11	Kinematics Fundamentals (Ch 3)	CH3.pdf
09/18	4-bar and Slider-crank Kinematic Analysis (Ch 4)	CH4A.pdf
09/25	5-bar and Multi-loop Kinematic Analysis (Ch 4)	CH4B.pdf
10/02	**EXAM 1 (from 6:00 to 8:00 pm)**	
10/09	Dimensional Synthesis (Ch 5)	CH5.pdf
10/16	Planar Mechanism Static Force Analysis (Ch 6)	CH6.pdf
10/23	Planar Mechanism Dynamic Force Analysis (Ch 7)	CH7.pdf
10/30	Gear Design and Kinematic Analysis (Ch 8)	CH8A.pdf
11/06	**EXAM 2 (from 6:00 to 8:00 pm)**	
11/13	Gear Design and Kinematic Analysis (Ch 8)	CH8B.pdf
11/20	Cam Design and Kinematic Analysis (Ch 9)	CH9.pdf
12/04	Kinematic Analysis of Spatial Mech. (Ch 10 and Ch 11)	CH10.pdf
12/11	Introduction to Robotic Systems (Ch 11)	CH11.pdf
TBD	**EXAM 1 (from 6:00 to 8:00 pm)**	

Grading
3 Examinations (25% each), Project (optional) 25%, Homework 25%
A≥90, 90>B+≥85, 85>B≥80, 80>C+≥75, 75>C+≥70, 70>D≥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**).
Any violation of the NJIT Honor Code (e.g., plagiarism and cheating on exams and assignments) will be penalized.
Make-up exams must be scheduled during office hours and within 1 week of the original exam date.

Link for Downloads http://www.softalink.com/kruss/me231/*filename.pdf*
/*SYLLABUS.pdf*

The following MATLAB toolboxes are needed for course assignments:

1. MATLAB
2. Simulink
3. Optimization Toolbox
4. Simscape
5. Simscape Multibody
6. Symbolic Math Toolbox

The following naming approach should be used for homework PDF files using HW_SET_1.pdf as an example:

HW_SET_1_###.pdf (where ### are the last 3 digits of your NJIT SID number)

For example, if the student's NJIT SID last 3 digits are 123, the homework PDF file would be named HW_SET_1_123.pdf (no spaces).